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Mapping the past:

A database approach to understanding the spread of novel archaeological traits in southern Africa, from 3000 years BP

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A thesis submitted to the Faculty of Science,

University of the Witwatersrand, Johannesburg,

in fulfillment of the requirements for the degree of

Doctor of Philosophy

2020

Declaration

I declare that this thesis is my own work and has not been submitted before for any degree or examination at any other University. By thesis, it is understood to mean my contribution for submission for the degree of Doctor of Philosophy at the University of the Witwatersrand by published and submitted articles.



Faye Lander

Date: 3 August 2020

Abstract

2300 years ago marks the beginning of two events in southern Africa's history. The first is the rapid appearance of non-indigenous livestock and pottery to the western half of the sub-continent. The second, marked by the appearance of cultivation and metal working to the summer-rainfall regions of southern Africa. Archaeologists have long grappled with how to disentangle the archaeology of these spread events – whether the appearance of novel traits marks an exogenous population migration or a transmission and cultural diffusion amongst autochthonous hunter-gatherer communities. Fast-paced genetic research finds migration as the main mechanism for change in the past, yet the research overshadows the role of hunter-gatherers in these processes. A renewed assessment for the archaeology, by an archaeologist, for this time period was thus timely. Five spatially georeferenced and radiocarbon dated southern African databases were compiled and analysed. This is the first time that the archaeology of hunter-gatherers, pastoralists and farmers are presented at a large-scale and at a resolution fine enough to interrogate these events. The open access spatio-temporal archaeological databases offered in the thesis means that this work can be used by other researchers interested in a similar field.

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A note on terminology

The issue of how to name human groups and their related subsistence practices is a contentious one (Kent 1996; Sadr 1998; Hodgson 2000; Kusimba 2005, Russell & Lander 2015). Throughout the thesis I have chosen to use the more conventional terms found in both African archaeological and ethnographic literature – *hunter-gatherer, forager, hunter-gatherer with livestock, herder, pastoralist, farmer, agriculturist* and *agropastoralist*. This seems rational because of the familiarity of these terms to readers. I am cognisant of the implications each of these names carry depending on the various ways in which they might be defined. For this reason, each term requires some clarification.

I use the terms broadly to describe the *predominant subsistence type of a particular group* whilst fully acknowledging that there would have been great diversity and fluidity in the type of subsistence being practiced (Kent 1996; Hodgson 2000; Kusimba 2005; Russell & Lander 2015). I outline the meaning I understand in each term below:

i. *Pastoralism/Pastoralist:*

The term pastoralism is a diffuse one and here I refer to it broadly as a production system that relies on livestock. There are multiple ways of being a pastoralist and I have chosen to adopt Hodgson's (2000: 6) definition as those groups who 'usually, depend on their livestock for food and trade, and must provide their animals with food, water and protection'. The advantage of this broad definition is that it allows for a greater involvement of social, cultural and economic practices at play than does any other single ecological or economic explanation. Because the archaeology connected with pastoralists on the western half of southern Africa has been strongly identified with the absence of cultivation, I have used this as a criterion in my definition. In Chapter 4, I use the term pastoralist to define archaeological sites that contain livestock remains and this encompasses hunter-herders, hunters-with-stock and stone-tool-using herders.

ii. *Herding/herder*:

In my review of the southern African archaeological literature, herding practices are often taken as synonymous with pastoralism with very little clear separation between the two. Karim Sadr (2003: 198) reserves the use of herding as a more *neutral* term for explaining the presence and proportions of livestock bones at a given archaeological site. In this thesis I prefer the term - pastoralism. A caveat to this is found in Chapter 6 where I use the term 'livestock-keepers' to specifically contextualise a point in time when hunter-gatherers made the transition to livestock-keeping.

iii. *Agropastoralism/Agropastoralist:*

I reserve these terms for groups practicing cultivation and stock-rearing including the use of animals for plough-cultivation and herding otherwise referred to as *mixed farming* (Murdock 1967). In this thesis I use these terms synonymously with farming/farmer.

iv. *Agriculture/Agriculturist:*

I use agriculturist to describe those groups practising agriculture at varying extents and include both permanent and/or shifting cultivation practices but without livestock-keeping (Murdock 1967). A caveat to this is in Chapter 5, where I have used agriculturists to include those groups with a mixed-farming economy (i.e. with livestock).

v. *Hunter-gatherer/forager:*

Of all the terminological frameworks put forward for describing the subsistence base of people, it has been perhaps not surprising to see that there is currently a general absence for definitions of hunter-gatherer groups. Just as agriculturists, pastoralists and agropastoralists, there is much diversity that shapes hunter-gatherer communities. There is no neat way to aggregate this diversity into a pigeonhole. In southern Africa, hunter-gatherers have been as much defined by their ethnographic contemporaries currently living in the central Kalahari Desert as they have been by the

excavated and painted archaeological record. I draw on both of these sources for this thesis (Chapter 5 and 6). For Lee and DeVore (1968) an adequate description might emphasize the role of hunting and collecting of wild plants and animals. For others the term hunter-gatherer might better be matched to a particular type of religion, ecological niche, mobility pattern or immediate versus a delayed-return strategy or social complexity (Binford 1980; Woodburn 1982; Lewis-Williams 1981, 2002; Kent 1996; Kusimba 2005). In this thesis I use a broad archaeological definition for hunter-gatherers to refer to people, past and present, whose subsistence base predominantly relies on wild resources and who do not have livestock but may have locally innovated pottery and/or adopted pastoralist or farmer pottery at various stages in history.

It is difficult to speak of pastoralism, agriculture and foraging in southern Africa without mentioning the linguistic and ethnic ties that have come to be so closely correlated with these practices. There has been much confusion surrounding the historical linguistic and ethnic terms. I have chosen to follow Alan Barnard's (1992: xxiii) approach by (1) sticking to the best-known terms when referring to people and (2) to use as precise a designation when possible. Throughout the most part of the thesis I use the term Khoe as a linguistic designation. I retain more precise ethnic designations for contemporary Khoe-language speakers. For example, the Naron, ||Gana and |Gwi (central Kalahari Khoe-speaking Bushmen groups) and Nama and Dama (Khoe-speaking pastoralists) of southwestern Africa. This approach is also applicable for Bantu-language speaking agropastoralist communities such as the Xhosa, Zulu and Swazi for example.

Chapter 1: Introduction

Archaeologists have long grappled with how to disentangle mechanisms for the spread of novel traits in the prehistoric material record - whether their appearance marks an exogenous population movement or local cultural innovation, transmission and diffusion amongst existing hunting and gathering communities. In southern Africa, 2300 years BP marks the beginning of two such events. The first is the rapid appearance of non-indigenous livestock, without agriculture, and pottery at Later Stone Age sites in the drier western half of southern Africa. There is a sustained debate – *the hunter-herder debate* – revolving around how livestock and pottery first reached southern Africa, whether by cultural or demic diffusion, or a combination of the two. The second, represents the largest language dispersal in African history - the spread of Bantu-language speakers, which is conventionally understood to have been tied to the dispersal of agropastoralism, village life and metal-working into the summer rainfall regions of the sub-continent. In southern Africa this occurs shortly after the initial introduction of livestock and pottery, without agriculture. Both of these events would have occurred in the presence of locally diverse, southern African hunter-gatherer populations. It is against this backdrop that this research project emerged.

The purpose of this research is twofold. First, to try to contribute to an understanding of this period in southern Africa's history using archaeological data. The need for this seems particularly pressing given the resurgence of interest in these debates by scientists, particularly, geneticists, whose results emphasize the role that migration has played in the spread of novel traits, frequently overlooking cultural diffusion completely. The question I raise, in the light of migrationist interpretations, is what does the archaeological data show, particularly about the place and the role of hunter-gatherers in these processes? Geneticists connect the spread of pastoralism to southern Africa with population movement with an origin in East Africa and estimate that this happened about 1300-2700 years ago (Henn *et al*. 2008; Scheinfeldt *et al*. 2010; Pickrell *et al*. 2012; Breton *et al*. 2014; Macholdt

et al. 2014; Pinto *et al.* 2016). In light of these findings, a renewed assessment of the archaeology, by archaeologists, is timely. The backbone of the research presented here are five southern African databases that I use to answer questions about the nature of these spread events. Each database was compiled with a research question in mind, and this is reflected in the type of contextual information captured. The databases largely present data dating from 3000 years BP and their geographic scope is southern Africa. This data relates to the timing of the appearance of non-indigenous livestock, ceramics, metal technologies, grindstones, permanent structures such as storage pits, mud-brick architecture (pole-and-*daga* structures), livestock enclosures, African crops, organic materials such as gourd, leather, fibre, and tortoise carapace bowls as well as ostrich eggshell containers and beads and paintings of fat-tailed sheep imagery. The databases presented in the thesis are:

1. The southern African database for the appearance of livestock, pottery, metal and crops.
2. The KwaZulu-Natal archaeological database for hunter-gatherer and agriculturist occupation from 3000 to 500 years ago (BP), South Africa.
3. The southern African archaeological organic database, 800 cal BC- cal AD 1500.
4. A southern African farmer and pastoralist publication database.
5. A southern African historical database of organic container use, 16th century onwards.

The second aim of the thesis was to make, freely available to researchers, geo-referenced radiocarbon data that is linked by archaeologists to these two spread events. The data is arranged so that the work presented in the thesis can be reproduced, interrogated and improved upon. In order to make the data accessible the decision was made to publish most of the data in the open access online journal, PLOS one.

The larger questions posed in the thesis are:

1. Does the archaeological data allow us to distinguish demic from cultural diffusion?

2. What does this approach contribute to current debates about the spread of novel traits in southern Africa?

Organization of the thesis

This thesis is by publication and three papers are presented with chapters for additional context and discussion.

Chapter 2 introduces the southern African databases and their contribution, particularly in light of calls for greater data accessibility and research replicability and reproducibility (Royal Society 2012; Beck & Neylon 2012; Pampel *et al*. 2013; Kansa & Kansa 2013; Silva 2014; Kristiansen 2014; Marwick 2017; Marwick *et al*. 2017). A review and assessment of other southern Africanist archaeological database work is presented. A gap in the spatial-temporal analysis to date, is the absence of data connected to southern African hunter-gatherer archaeology – this is addressed in Chapters 5 and 6.

Chapter 3 reviews the genetic and linguistic research that is driving the resurgence of the popularity of migration as an explanation for prehistoric cultural change, particularly in the context of the hunter-herder debate. I discuss the contribution that archaeologists can make, perhaps in presenting a more balanced view of these processes.

Chapter 4 presents a paper published in June 2018 by Lander, F. and Russell, T. in PLOS one, titled: *The archaeological evidence for the appearance of pastoralism and farming in southern Africa.* In this paper we present a geo-referenced radiocarbon database named: *The southern African database for the appearance of livestock, pottery, metal and crops* – the first to contain archaeological evidence for

pastoralism and farming in southern Africa for the period 550 cal BC to cal AD 1050. It captures several different types of archaeological evidence that have traditionally been used to identify both spread events at a large scale. There were two main aims to this paper. The first to present two spread events – early livestock and ceramics connected with Later Stone Age herding together with the archaeological evidence for farming. Traditionally, these two events are conceptually separated often obscuring their contemporaneity. The second was to see if there was a moving archaeological 'package' evident. The spatial patterns observed in the archaeology for this time period were compared to a further dataset, *The southern African farmer and pastoralist publication database*, compiled to get a picture of potential research bias in the archaeology, the findings are presented. Both databases are available via https://doi.org/10.1371/journal.pone.0198941.s010. The databases and other supplementary material are provided in Appendix 3 of the thesis.

Chapter 5 presents analysis of a regional-scale database, *The KwaZulu-Natal archaeological database for hunter-gatherer and agriculturist occupation from 3000 to 500 years ago (BP), South Africa,* to look at changes through time and space in both the painted and excavated record of hunter-gatherers and farmers from 3000 to 500 years ago (BP), in KwaZulu-Natal, southeastern South Africa. My aim was to investigate hunter-gatherer paintings of sheep, particularly as rock art is largely overlooked as evidence in the hunter-herder debate. The analysis suggests unexpected reactions by hunter-gatherers to farmer presence. The paper, "*Fat-tailed sheep and thin-walled pots: contextualising rock art and pre-agriculturist pottery within the last 3000 years in KwaZulu-Natal, South Africa"* was published in December 2015 in the journal, Southern African Humanities. The database is connected to this publication and is provided in Chapter 5.

Chapter 6 presents the spatial-temporal mapping of two further databases. These are an archaeological organic database, *A southern African archaeological organic database, 800 cal BC- cal AD 1500* and a historic database, *A southern African historical database of organic container use, 16th century onwards,* that captures

accounts of organic container use amongst historically known southern African populations. The analysis suggests that ostrich eggshell containers can be used as a proxy for hunter-gatherer presence and that cultural diffusion was the main mechanism for the spread of pottery and livestock at 2300 – 2100 years ago BP. The paper titled: *A southern African archaeological database of organic containers and materials, 800 cal BC to cal AD 1500: Possible implications for the transition from foraging to livestock-keeping*, was published in 2020 with the journal PLOS one. The supporting databases for this paper is provided through the link: https://doi.org/10.1371/journal.pone.0235226 or, alternatively, can be viewed in Appendix 4 of the thesis.

Chapter 7 concludes the thesis with an appraisal of the approach taken in this research, the main contribution to the archaeological debates and ideas for future improvements to the research.

Chapter 2: The southern African databases

2.1 Introduction

This chapter introduces the five databases compiled for the thesis. Three of these present geo-referenced, radiocarbon dated southern African archaeological data and are named:

1. The southern African database for the appearance of livestock, pottery, metal and crops (Chapter 4, Appendix 3*)*.
2. The KwaZulu-Natal archaeological database for hunter-gatherer and agriculturist occupation from 3000 to 500 years ago (BP), South Africa (Chapter 5).
3. The southern African archaeological organic database, 800 cal BC- cal AD 1500 (Chapter 6, Appendix 4).

Two ancillary databases were compiled to help understand the southern African archaeological data, these are:

4. A southern African farmer and pastoralist publication database (Chapter 4, Appendix 3).
5. A southern African historical database of organic container use, 16th century onwards (Chapter 6, Appendix 4).

The methods used in the compilation of these databases are not presented here as they are covered in each of the Chapters 4, 5 and 6.

The overriding aim of the database work was to create meaningful, qualitative and quantitative archaeological datasets that could be accessible and used by other researchers, and used to try to answer questions about the spread of livestock and other novel traits. This was a challenging task because of the nature of the

archaeological data – fragmentary, scattered and uneven in geographic coverage (see Chapter 3 where these challenges are addressed, as well as the implications for the analysis).

2.2 Archaeological data as open-science

Archaeological data is increasingly attractive for disciplines, in particular fast-paced genetic research, that are interrogating similar questions about the human past - particularly population migration, its origins and routes. A limitation to genetic research is the ability to match accurate time-scales to their findings, something that archaeology potentially offers through dating and associated material culture.

The call for scientific open data has peaked in a number of online journals which have posted calls for data accessibility and data reproducibility to allow researchers to interrogate the methods used and the patterns observed (Pompel *et al.* 2013). The open access journal PLOS one and the Royal Society's journals are examples of this move (Royal Society 2012; Silva 2014). For the Royal Society the policies governing science as an open enterprise is highlighted in their mandate:

> Open inquiry is at the heart of the scientific enterprise. Publication of scientific theories - and of the experimental and observational data on which they are based - permits others to identify errors, to support, reject or refine theories and to reuse data for further understanding and knowledge. Science's powerful capacity for self-correction comes from this openness to scrutiny and challenge (Royal Society 2012: 7).

The database work offered in this thesis allows the archaeological data to be easily accessed and reproduced. To this point, the existing 'open-ness' of archaeological data for the two spread events in southern Africa have been limited by a number of factors which I draw attention to below. In this respect I hope to contribute to 'science as an open-enterprise' (Royal Society 2012:1) and in doing so, allow for

other researchers to critically assess the value of the archaeological record, the nature of its evidence and its meaning in the current debates.

In terms of open-science I define the following:

1) Accessibility: Data that is located in a manner that is readily available and useable (Royal Society 2012; Marwick 2017). Locations include online database repositories or online supplementary files attached to main research articles and which are formatted to allow for easy data extraction, i.e. data presented in Microsoft Excel spreadsheets or Word documents.
2) Reproducibility: The methods used to assemble the data, its analysis and visualisation determines how easily the data and analysis can be reproduced by other researchers (Marwick 2017). Data reproducibility does not require independent data collection but makes use of both the original methods and datasets (*ibid*).
3) Replicability: This is distinct from data reproducibility whereby the original investigator's methods can be used on a newly created dataset (*ibid*.).

The provenience of data, i.e. its original context, is particularly important for attempts to reproduce or replicate any given dataset (Marwick 2017).

2.3 The rationale behind compiling new southern African archaeological databases for the time period starting at 2300 years ago.

There has been a steady rise in the number of radiocarbon datasets covering the last 2000 years of southern African archaeology. These datasets include simple lists of radiocarbon dates and archaeological site names, with or without geographic co-ordinates, and with no archaeological information on material finds (Deacon 1974; Hall & Vogel 1980; Klein 1986; Parkington & Hall 1987; Bousman 1998; Huffman 2007), detailed tables that combine archaeological site names, radiocarbon dates

and associated archaeological finds, with or without information on site locations (Morais 1988; Russell 2002, 2004; Sadr & Sampson 2006; Sadr 2008a, b, 2014, 2015; Russell & Steele 2008; Russell & Lander 2015; Jerardino *et al.* 2015) and more recently, online web-based digital databases or online supplementary files housing large datasets of radiocarbon dates, archaeological site names and phases alongside geographic locations (Russell *et al.* 2014; Loftus 2018). Missing from these databases are the contextual information and the provenience of site finds- the qualitative data. During the first stages of this project these databases were reviewed to get a sense of the type of archaeological data reported previously. To illustrate some of the limitations I discuss eight previously compiled southern African datasets which either relate directly to the hunter-herder debate and/or the spread of agropastoralism around 2300 years ago BP or which cover the same broad timeframe (Table 2.1). I discuss their limitations below.

i. Missing fields.

The following fields are essential in any attempt to reproduce qualitative and quantitative spatio-temporal analyses: a site's geo-referenced location, uncalibrated radiocarbon determinations and associated laboratory names and identity numbers, the type of materials dated, and the stratigraphic unit from which the date derives. Yet in six of the eight datasets in Table 2.1, at least two of these fields are absent (four datasets have three missing fields; two datasets have two missing fields, and one dataset is missing stratigraphic context).

The material used to obtain a radiocarbon date is missing from six of the databases. This information is critical to assess the reliability of a date by identifying the type of material that has been dated, for example ostrich eggshell carbonate is considered less reliable for dating than conventional bone or charcoal samples (c.f. Vogel *et al.* 2001; Janz *et al.* 2015), and for the correction for the carbon reservoir effect (Stuiver *et al*. 1998; Reimer & Reimer 2001; Dewar *et al*. 2012; Reimer *et al.* 2013; Maboya *et al.* 2018).

ii. Missing qualitative data

Very little description of the archaeology is provided in these datasets and rarely are more than two types of archaeological evidence presented together. The focus might be on ceramic type, or livestock presence or absence, for example. There is limited information provided on the reliability of the association between dates and archaeological material. Traditionally, evidence of pottery is used as a proxy for the appearance of both spread events in southern Africa whilst the presence of livestock and more recently, stone tools kits, have been used to identify Later Stone Age herding on the subcontinent (Phillipson 1976a; b; 1977; Deacon *et al.* 1978; Huffman 1980; 2007; Klein 1986; Kinahan 1991; Smith 1990, 1993; 1998, 2006, 2008; Smith *et al.* 1991; Sadr & Smith 1991; Webley 1992; Sadr 1998, 2003, 2008a, 2008b, 2015; Bousman 1998; Orton 2012; Jerardino *et al*. 2015). Such a confined trait list waters-down a diverse range of material assemblages reported for sites (c.f. MacLean 1994; Pikirayi 2007; Fredriksen & Chirikure 2015). Various assemblages such as ostrich eggshell, metals, grindstones, pigments such as ochre and specularite, and archaeological features such as grain storage pits, pole-and-*daga* (mud-architecture) structures, livestock enclosures, rock engravings and paintings – could potentially broaden the spectrum of what is currently relied upon to define the two spread events in southern Africa.

iii. Lumping of radiocarbon dates and stratigraphic units

The aggregation of data derived from a series of stratified occupational units obscure changes through time (Table 2.1, see Sadr 2008a, 2015).

iv. Limited accessibility

Of the eight databases reviewed in Table 2.1 half were identified as not easily accessible. This may be due to a number of factors that have

traditionally shaped how data is shared with the broader scientific community. Archaeologists have published most datasets in journals that have subscription fees or limitations in the amount or format of data that can be provided. This results in only a small aggregate sample of a complete dataset being shared (Marwick 2017). Of the databases reviewed in Table 2.1, four require subscription or full payment for online access (Morais 1988; Sadr & Sampson 2006; Russell 2004; Sadr 2008a) whilst one is not available online (Huffman 2007). Of these five datasets only one provides a complete dataset that can be reproduced, but this is not easily accessible (Russell 2004). Traditionally, researchers have viewed data as proprietary. An approach that advocates *data-stewardship* as opposed to *data-ownership* (Hampton *et al.* 2015:3) has the advantage of (1) reaching a greater audience in the scientific community and fostering collaborative projects and (2) allowing data to be open for validation, testing and scrutiny. It is for these reasons I chose to publish two of the papers and the unaggregated southern African databases with the open access journal PLOS one.

v. Limited reproducibility and replicability

The ability for data to be reproduced and replicated will be determined by how well the original investigator's methods are made accessible and transparent (Hampton *et al.* 2015; Marwick 2017). In the southern African datasets reviewed here, the methods used in their formulation are provided but frequently limited in their detail. Missing methodological details such as the provenience of data sourcing, its compilation process and visualisation were found in two of the southern African datasets (Huffman

Table 2.1. A selection of databases covering the last 2000 years of southern African archaeology with a review of what they offer and their limitations.

Name of database *Name of Compiler* *Date of compilation* *Date of publication*	*What is offered by the database*	*Database limitations*
The Southern African Radiocarbon Database (SARD). ▪ Emma Loftus ▪ Launched in 2018. ▪ Loftus *et al*. (2018)	▪ A spatio-temporal database for radiocarbon dates in southern Africa spanning the last 50 000 years. ▪ 2500 radiocarbon determinations and direct dates from 600 sites. ▪ Largest southern Africa radiocarbon database to date. ▪ A large amount of archaeological coverage for the southern African region. ▪ Easily accessible through login details to the Oxford Accelerator Unit (ORAU). ▪ Link to database: https://c14.arch.ox.ac.uk/sadb/db	**i.** Reliability of date is not provided. **ii.** Missing qualitative data for a site's material assemblages.
A geo-reference sub-Saharan database of early Iron Age dates. ▪ Thembi Russell. ▪ Russell & Steele (2008); Russell *et al*. (2014)	▪ 615 radiocarbon determinations from 588 sites (includes all of sub-Saharan Africa). ▪ First comprehensive geo-referenced radiocarbon database for sub-Saharan African Early Iron Age. ▪ Link to database: https://doi.org/10.1371/journal.pone.0087854	**ii.** Limited contextual information. Offers only earliest dates for early farmer spread and not a sequence of dates for early farmer occupations. **iv.** Database is not published in full and therefore not fully accessible.
Database of the sub-Equatorial African LSA sites and components. ▪ Karim Sadr ▪ Sadr (2015)	▪ 128 site components containing total count of formal stone tools and percentages of backed tools and scrapers through two chronological phases dating between 4000 and 2000 years ago (BP) and 2000 to 1000 years ago (BP). ▪ Easily accessible.	**i.** Missing fields such as site location, uncalibrated radiocarbon dates and materials dated. **ii.** Limited to a single archaeological find – lithics.

Table 2.1. A selection of databases covering the last 2000 years of southern African archaeology with a review of what they offer and their limitations.

Name of database *Name of Compiler* *Date of compilation* *Date of publication*	*What is offered by the database*	*Database limitations*
	▪ Link to dataset: https://doi.org/10.1371/journal.pone.0134215	**iii.** The lumping of stratigraphic units and associated radiocarbon ages at sites relative to the type of formal tool kit recorded for the two proposed phases.
The Southern African database for the first occurrence of domestic stock in the western half of southern Africa. ▪ Thembi Russell ▪ 1999 ▪ Russell (2002, 2004)	▪ The first geo-referenced and radiocarbon dated dataset for the spread of the first livestock in southern Africa. ▪ 116 radiocarbon determinations and direct AMS dates for livestock at 27 sites. ▪ Easy to reproduce.	An earlier compiled dataset therefore the sample size is limited. **ii.** Focus is on a single archaeological find – domestic fauna. **iv.** Difficult to access as it is a PhD thesis and not downloadable online.
Early Neolithic non-Bantu radiocarbon dated domestic fauna from southern Africa. ▪ Antonieta Jerardino ▪ Jerardino *et al*. (2015)	▪ A georeferenced radiocarbon database for early livestock in southern Africa. ▪ 17 radiocarbon dates from 13 sites. ▪ Easy to access and reproduce. ▪ Link to dataset: https://doi.org/10.1371/journal.pone.0113672	A small sample of the archaeological record. **i.** Missing stratigraphic contextual information. **ii.** Focus in on a single archaeological find – livestock.
A radiocarbon list of Early Iron Age and related sites in Eastern and Southern Africa. ▪ João M. Morais	▪ 378 radiocarbon determinations from 202 sites. ▪ A summary is provided each early Iron Age site in southern Mozambique. ▪ Easy to access.	**i.** Radiocarbon dates are already calibrated without original radiocarbon determinations reported. Missing fields of

Table 2.1. A selection of databases covering the last 2000 years of southern African archaeology with a review of what they offer and their limitations.

Name of database *Name of Compiler* *Date of compilation* *Date of publication*	*What is offered by the database*	*Database limitations*
▪ Morais (1988)		stratigraphic context and type of material dated. **ii.** Limited contextual information for archaeological traits at site. **iv.** Limited accessibility as there is no downloadable file.
Radiocarbon dates from LSA and EIA sites associated with ceramics before the mid first millennium AD. ▪ Sadr & Sampson (2006)	▪ 200 radiocarbon determinations from 92 sites. ▪ Combines three types of pottery: LSA thin-wall mineral tempered ware and grass-tempered ware with Early Iron Age ware.	**i.** Stratigraphic context and site locations are absent. **ii.** Single archaeological find reported – ceramics (thick-walled and thin-walled mineral and grass-tempered ware) with no further descriptions. **iv.** Not easy to access as the journal requires a subscription fee. **v.** Not easy to reproduce as there is no downloadable file to extract data or methods to follow.
Faunal remains from a list of LSA sites and site components. • Karim Sadr • Sadr (2008a)	▪ 56 LSA sites and 23 Early and Late Iron Age sites. ▪ Total count of faunal assemblages from both LSA and Iron Age sites.	**i.** Original radiocarbon determinations and direct dates are not provided. Missing site location and the type of material dated. **ii.** Single archaeological find reported: faunal assemblages. **iii.** Lumps data into two 1000-year (BP) phases.

Table 2.1. A selection of databases covering the last 2000 years of southern African archaeology with a review of what they offer and their limitations.

Name of database *Name of Compiler* *Date of compilation* *Date of publication*	*What is offered by the database*	*Database limitations*
		iv. Not easy to access due to a subscription fee to a journal. **v.** Not easy to reproduce as the data is not downloadable in a format where it can be extracted. Methods are not provided.
Handbook to the Iron Age, Appendix of Radiocarbon dates before present. ▪ Thomas N. Huffman ▪ Huffman (2007)	▪ 531 radiocarbon determinations for Early and Late Iron Age sites. ▪ Sites are classified into respective ceramic facies.	**i.** Missing stratigraphic context, site location and type of material dated. **ii.** Single archaeological find – ceramics. **iv.** Not easy to access as it is currently not available as an E-book. **v.** Not easy to reproduce. Data is not easily extractable and the methods for capturing this data is not discussed.

2007; Sadr 2008a). Without guide to the method used, this work will not be able to be reproduced.

The databases presented in this thesis attempt to fill the gaps described above. One of the key pieces of missing information in all the databases collected to date, in relation to the spread of livestock keeping and farming in southern Africa, is the archaeology of hunter-gatherers. To improve the data collected and presented I assembled the following criteria for database construction:

1. The inclusion of existing hunter-gatherer archaeology for the time-period beginning at 3000 years ago (BP). This allowed me to consider patterns in the archaeology prior to the first appearance of novel traits such as pottery and livestock, and to explore any patterns after their introduction.
2. Collection of site specific and interpretive data. This included a site's occupation history, its sequence through time through identification of individual stratigraphic units, the association between what is being dated and the cultural assemblage under investigation, and an inventory for material assemblages within each depositional unit.
3. Documentation of the excavator's *voice* as a credible and a reliable source. In particular to capture their descriptions of the reliability of radiocarbon determinations, stratigraphic integrity and the identification of material remains, their counts, and their thoughts on the subsistence economy of the occupants of the site.
4. A focus on data sharing accessibility – by publishing in open source journals and the Wits digital data repository.
5. Reproducibility: data used in this analysis is presented so that the work can be reproduced, and improved upon.

The archaeological data presented in Chapters 4, 5 and 6 are approached using a spatio-temporal analysis using time-slices to group events on the southern African landscape. These time-slices are grouped by 200 (Chapter 4), 300 (Chapter 5) and

600 (Chapter 6) years respectively. This is the first time that this set of archaeological data has been presented at this scale and resolution.

2.4 The compilation of three geo-referenced radiocarbon dated archaeological databases for southern Africa, from 3000 years ago (BP)

The capture of large quantities of data is a time-consuming task. During the course of data capturing, the relevant documentation (i.e. site excavation reports) had to be critically interrogated often requiring repeated reading. In addition, the data captured from earlier site reports had to be compared and included with more recent excavations. Before the data could be recorded it had to go through a selection process. This included criteria such as whether or not the site contained reliable dates, provided geographic co-ordinates and contained the relevant material assemblages under investigation. The advantage of this exercise is that it allows for a greater understanding of the nature of the archaeological data, and the difficulty and challenges it presents to the researcher trying to make sense of it.

The sources consulted during the course of data capturing included: published and unpublished site excavation reports, digital museum catalogues and archaeological assemblages housed at two South African museum-based repositories –the Iziko Museum in the Western Cape Province and the McGregor Museum in the Northern Cape Province of South Africa.

The first of the five databases compiled was *The KwaZulu-Natal archaeological database for hunter-gatherer and agriculturist occupation from 3000 to 500 years ago (BP), South Africa* (Chapter 5) which I captured between June and August 2015. Its geographic scope is relatively small, focusing at the provincial-scale of KwaZulu-Natal in South Africa. The southern African databases assembled for Chapters 4 (Appendix 3) and 6 (Appendix 4) were compiled within a year of each other between January 2016 to July 2018 and from September 2018 to July 2019, respectively. Two months in 2017 were used to visit two museum collections to record the remains of organic ostrich eggshell containers, mineral- and grass-

tempered pottery and other organic material remains from six sample sites (Chapter 6, Appendix 4).

Each database has a different geographic scope within southern Africa, which is defined as the area south of the 10th parallel. This includes the following countries: Botswana, the Kingdom of Eswatini (formerly Swaziland), the Kingdom of Lesotho, Mozambique, Malawi, Namibia, South Africa and Zimbabwe with partial coverage for the countries of Zambia and Angola (Fig. 2.1). *The southern African database for the appearance of livestock, pottery, metal and crops database* as published in Chapter 4 (Appendix 3) covers the largest portion of southern Africa as defined above for both spread events – pastoralism and agropastoralism in the archaeology (Fig. 2.1 A and Chapter 4). In Chapter 5, a small-scale regional approach was taken to capture the archaeology of hunter-gatherers and agropastoralists for the KwaZulu-Natal Province of South Africa. Here the earliest arrival of agriculturists and existing hunter-gatherer occupations within the Thukela River Basin were patterned through time and space (Fig. 2.1 C and Chapter 5). Chapter 6 presents an archaeological database that covers all Later Stone Age sites that fall between the latitudes 17 to 34 degrees south and between longitudes 11 to 33 degrees east (Fig. 2.1 B and Chapter 6).

A total of 845 radiocarbon determinations and direct dates from 428 sites were collected. This tally captures the total for the combined three databases (Fig. 2.2 and Table 2.2). Of the direct dates, 20 derived from sheep bone (*Ovis aries*), 5 derived from cattle bone (*Bos taurus*), whilst 33 derived from pottery (both grass-tempered and charcoal-tempered wares). A full list of the archaeological sites, their locations and their radiocarbon determinations are provided in Appendix 1. A description of the type of archaeological data captured for each database is presented in Table 2.3.

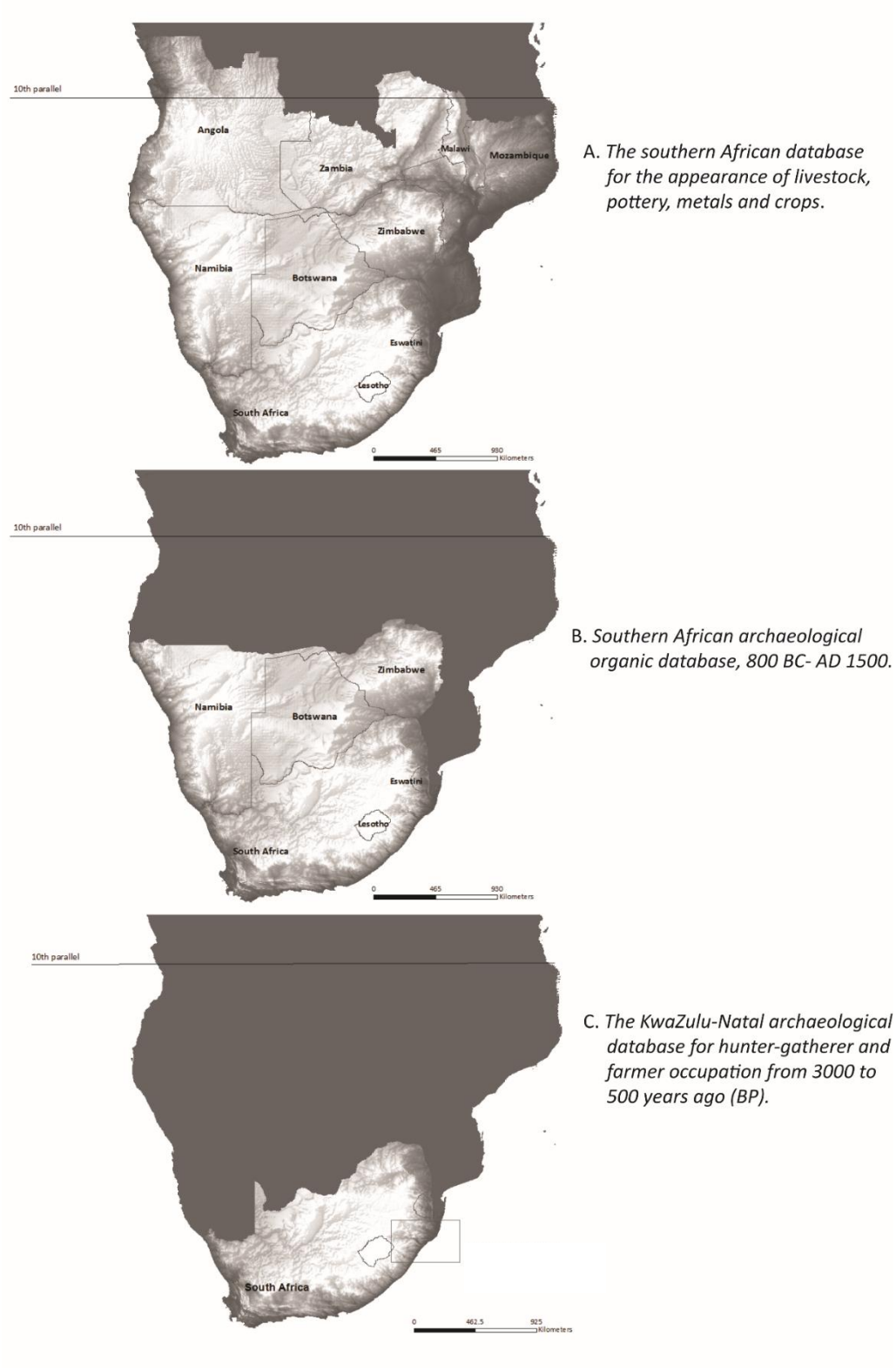

Figure 2.1. The geographic coverage of the three geo-referenced radiocarbon dated archaeological databases. All of the sites captured for this thesis fall within either areas A, B or C.

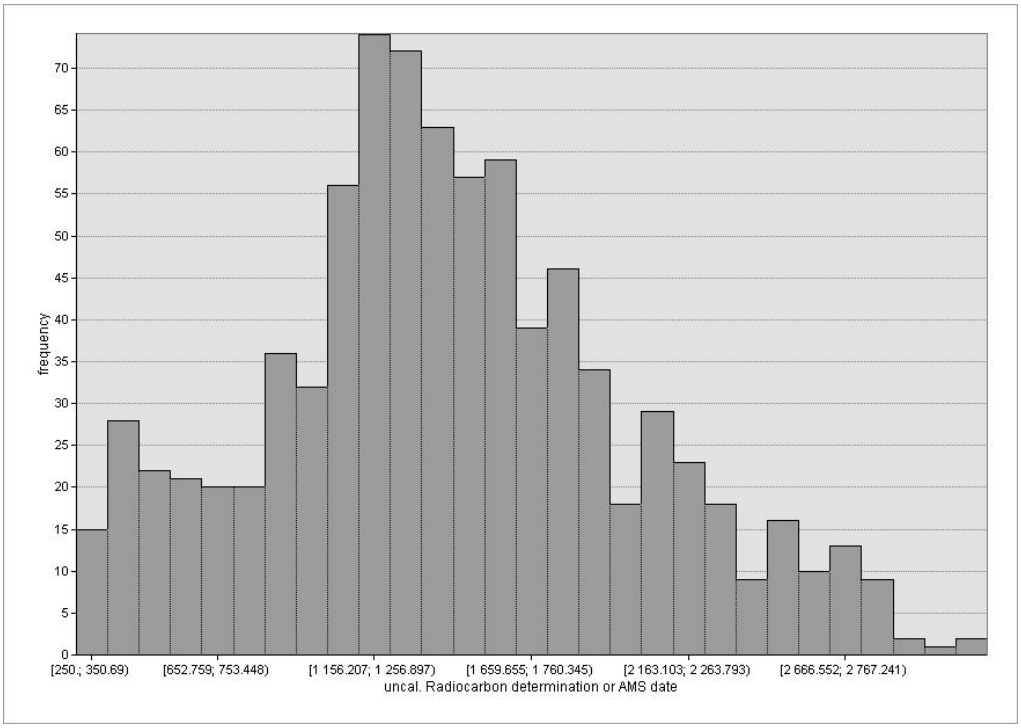

Figure 2.2. Temporal distribution of uncalibrated radiocarbon dates from the three southern African archaeological databases.

Table 2.2. A summary of the number of radiocarbon dates and sites captured in the geo-referenced radiocarbon dated southern African databases, 3000 to 400 years ago (BP).

Southern African Archaeological Database	**Time Range (BP)**	**Number of uncalibrated radiocarbon determinations and direct dates**	**Number of sites**
The southern African database for the appearance of livestock, pottery, metal and crops. **(Chapter 4)**	2300 – 900 years ago	**205** (Later Stone Age) **265** (Agriculturist or agropastoralist) **5** (Metal-worker sites)	**93** (Later Stone Age) **113** (Agriculturalist or agropastoralist) **3** (Metal-worker sites)
The KwaZulu-Natal archaeological database for hunter-gatherer and agriculturist occupation from 3000 to 500 years ago (BP), South Africa. **(Chapter 5)**	3000 – 500 years ago	**59** (Later Stone Age) **43** (Agriculturalist or agropastoralist)	**28** (Later Stone Age) **22** (Agriculturalist or agropastoralist)
The southern African archaeological organic database, 800 cal BC-cal AD 1500. **(Chapter 6)**	3000 – ±400 years ago	**489** (Later Stone Age)	**187** (Later Stone Age)
Total		**1066**	**446**

Table 2.3. The type of fields captured for the three geo-referenced radiocarbon dated southern African archaeological databases.

Type of fields captured	The southern African database for the appearance of livestock, pottery, metal and crops. **(Chapter 4)**	The KwaZulu-Natal archaeological database for hunter-gatherer and agriculturist occupation from 3000 to 500 years ago (BP), South Africa. **(Chapter 5)**	The southern African archaeological organic database, 800 cal BC- cal AD 1500. **(Chapter 6)**
Latitude and Longitude site location	Not published	Not published	Available
Type of site	Provided	Not provided	Provided
Uncalibrated dates, laboratory codes and stratigraphic contexts	Provided	Provided	Provided
Calibrated dates	Provided	Provided	Provided
Date Rating or Grade	1-3 rating system	None	1-3 rating system
Temporal distributions as indicated through a set of time slices	1-7 groups of 200-year time slices	1-6 groups of 300-year time slices	1-4 groups of 600-year time slices
Source reference material	Provided	Provided	Provided
Subsistence economies at site	Pastoralism Agriculture Agropastoralism Metal working	Hunting and gathering Agriculture Agropastoralism	Hunting and gathering Transition to pastoralism Pastoralism
Categories of archaeology captured for each stratigraphic unit associated with a radiocarbon determination	Mineral-tempered pottery. Grass-tempered pottery. Livestock. Agriculturalist pottery. Metal working. Metal artefacts. Permanent structures. Grindstones. Crops.	Early thin-walled mineral-tempered pottery. Agriculturalist pottery. Livestock. Metal. Crops. Exchange items (ostrich eggshell beads, terrestrial and marine shell beads, metals). Rock paintings.	Organic remains (gourd, leather, twine, tortoise carapace). Ostrich eggshell containers and beads. Mineral-tempered pottery. Grass-tempered pottery. Livestock.
Frequency counts	Livestock counts provided as minimum number of individuals (**MNI**) or Number of identifiable specimens (**NISP**).	Livestock counts provided as minimum number of individuals (**MNI**) or Number of identifiable specimens (**NISP**).	Livestock counts provided as minimum number of individuals (**MNI**) or Number of identifiable specimens (**NISP**). Number of ostrich eggshell beads present in a stratified context **(N).** Number of potsherds present in a stratified context.

In addition to the geo-referenced radiocarbon archaeological databases, I compiled two southern African databases to compliment the archaeological analysis. The first database: *A southern African farmer and pastoralist publication database,* presents a quantitative dataset of publications covering archaeological themes of pastoralism and farming in southern Africa from the period 1950 to 2016. It covers 2033 publications, each of whose research interest is geographically situated within the southern African landscape. This was used to create a map to show where research has been focused in the region to allow me to get a sense of the bias that this might introduce to any analysis (Chapter 4, Appendix 3). The second database, named the *Southern African historical database of organic container use, 16th century onwards,* includes 89 entries for the use of organic containers by contemporary and extant southern African Khoe, Ju and Tuu language speaking and Bantu-language speaking communities (Chapter 6, Appendix 4). I discuss the use of these databases in Chapters 4 and 6 respectively.

2.5 Challenges to compiling meaningful databases for the spread of novel traits in the southern African archaeological record

Over 380 sources were consulted during the course of data capturing for the three archaeological databases. The quality of data reporting was highly varied not least because there is no standard of excavation reporting followed in archaeology. A rigorous assessment of these sources uncovered a set of challenges that had to be considered before the data could be captured. To acknowledge these challenges, I have extracted Africanist archaeologists' descriptions, verbatim, of the type of evidence used in the debates surrounding both spread events in southern Africa (Table 2.4). Whilst this is obviously not indicative of all archaeological reports reviewed during the processing of data, it serves to give a sense of the nature of the evidence used in the debates. This is discussed in Chapters 4 and 6.

Table 2.4. The nature of archaeological evidence as reported by southern Africanist archaeologists and its implications for compiling a meaningful dataset for the spread of novel traits.

Absence of direct evidence.	"The next oldest lugs were found at Matlapaneng in northern Botswana, dating to between AD 700 and AD 1000 (Denbow, personal communication). Unfortunately, there is no published information on the context of the two lugs and their radiocarbon date." (Sadr 2008b: 112)
Problems revolving around the credibility of contextual information.	"In his article in the same volume Wilmsen discusses a "cow" maxilla and states that "associated (our emphasis) charcoal yielded a radiocarbon age of 1 150 + 60 years". Given a horizontal distance of 8 m between bone and charcoal sample and the lack of continuous connecting section, this stretches the concept of "associated" well beyond both standard archaeological usage and credibility. In his response to our criticisms he defends this "association" and bases this justification on the fact that his "field notes record that a single artefact cluster seemed to be indicated". We find this extremely difficult to understand. How is a "single artefact cluster" defined in holes 8 m apart?" (Yellen & Brooks 1990: 17)
Large margins of error in radiocarbon determinations.	"The first detailed faunal evidence for the Iron Age comes from Malawi and Zambia. The faunal remains from Nkope (*4th - 8th century AD*; Speed 1970) are dominated by wild species with a very large number of remains from aquatic animals such as soft-shelled turtles and fish. A single deciduous tooth was identified as belonging to Bos Taurus." (Voigt 1986: 13).
Assumptions that sites are representative of single occupations that reflect only 'first' introductions.	"reoccupation of preferred site locations must now be regarded as a likelihood. Both sites and assemblages need to be examined with this in mind rather than the acceptance of the often-implicit assumption of a single occupation" (Maggs & Ward 1984:136)
Problems associated with direct correlations between finds and radiocarbon determinations.	Given the well-documented mobility of objects within archaeological deposits (e.g. Hughes & Lampert 1977; Villa 1982; Villa & Courtin 1983; Gifford-Gonzalez *et al.* 1985), one wonders whether the 'earliest' sheep might in fact be more recent bones which have become mixed with older deposits." (Sealy & Yates 1996: 62)

2.6 Summary

This chapter has introduced the five databases used in this research. The rationale behind building each of these will be covered in Chapters 4, 5 and 6 where the data is analysed. In the next chapter I review the genetic, linguistic and archaeological data used in the debates about the spread of pastoralism and farming in southern Africa.

Chapter 3: A review of the use of Archaeology, genetics and linguistics to reconstruct the spread of livestock and other novel traits in southern Africa from 2300 years ago.

3.1 Introduction

In 2014 a team of geneticists, in collaboration with an Africanist archaeologist, published their findings which suggested a past genetic link between a southern African Khoe-speaking pastoralist group, the Nama, and an Afro-Asiatic pastoralist population from eastern Africa, and dating to around 1300 years ago (Breton *et al*. 2014). The findings were based on tracing the gene that produces the enzyme that allows adult Nama to digest fresh milk, a genetic trait that is absent, or present in negligible frequencies, amongst present-day farmer and hunter-gatherer populations (Tishkoff *et al*. 2007; Rancario *et al*. 2014). Genetic research amongst southern African modern population groups supports the idea of a migration of a pastoralist people to southern Africa within the latter part of the first millennium AD (Henn *et al*. 2008; Breton *et al.* 2014; Macholdt *et al.* 2014). However, the earliest and most secure evidence for the first appearance of livestock derives from the archaeology. Dated to approximately 2300 years ago, this is 1000 years earlier than the arrival of pastoralists as suggested by geneticists. The archaeology not only points to the earlier presence of livestock-keepers and pottery–users but also to the first arrival of crop and metal users at around 1800 years ago.

Genetic research, more so than ever, is driving the resurgence of the popularity of migration as an explanation of change, this is something with which archaeologists have grappled for many decades (Childe 1950; Clark 1967, 1970; 1984; Cooke 1965; Inskeep 1978; Deacon *et al.* 1978; Trigger 1980; Smith 1990, 2006, 2014; Antony 1990; Bellwood 1995, 2005, 2014; Kinahan 1994; Zvelebil 1996, 2009; Sadr 1998, 2003, 2008a, b, 2013a, b 2015; Steele *et al*. 1998; Douglas Price 2000; Bogucki 2000; Zvelebil & Lillie 2000; Burmeister *et al.* 2000; Gkiasta *et al*. 2003; Lane 2004; Russell 2004; Lane *et al.* 2007; Li *et al.* 2007; Chami 2007; Steele 2009;

Hakenbeck 2008; Orton 2012, 2015; Russell *et al*. 2014; Jerardino *et al.* 2015; Silva *et al.* 2015; Jordan *et al.* 2016).

One of the questions that arose during the course of this PhD was the influence that genetics, and to a lesser extent, linguistics, is having on the archaeological discipline and whether the material culture and archaeological interpretations thereof, agree with the genetic interpretations of past population movements. How are disciplines outside of archaeology affecting the way archaeologists are seeing archaeological data?

This chapter is a review of the literature that has informed the thesis and serves as an introduction to the papers presented in Chapters 4, 5 and 6. The chapter is in three parts: Part One, the archaeology, Part Two, the genetics and Part Three, the linguistics. The objectives are:

1. To review the archaeology and its interpretations and to look for gaps and limitations in its application to date.

2. To present the current genetic and linguistic evidence that is used to explain migration as the main mechanism for the two spread events in southern Africa and to highlight their limitations for their application in the archaeology with special relevance to the hunter-herder debate.

3.2 Assessing the archaeological evidence and its application in the debates about the spread of novel traits into southern Africa beginning at 2300 years ago.

I start by offering a review of the key debates that have characterised the archaeology of the two spread events in southern Africa. In particular, how southern Africanist archaeologists have gone about interpreting the evidence. Here, I speak to the two spread events separately because traditionally archaeologists have dealt with their archaeology quite differently.

3.2.1 The appearance of livestock and ceramics, without agriculture, during the Later Stone Age in southern Africa.

Southern African archaeological evidence indicates that around 2300 years ago (BP) the first domestic livestock, predominantly sheep, and mineral-clay-tempered vessels reached the drier western half of southern Africa. The mechanisms and timing for this spread are continuously debated (Deacon *et al.* 1978; Inskeep 1978; Walker 1983; Denbow 1986; Klein 1986; Smith 1990, 1998, 2006, 2008, 2017; Kinahan 1991; Sadr 1998, 2003, 2008a, b, 2014, 2015, 2019; Bousman 1998; Mitchell 2002; Russell 2004; Sadr & Sampson 2006; Fauvelle-Aymar 2004, 2008; Parsons 2015; Russell & Lander 2015; Jerardino *et al.* 2014; Orton 2015; Lombard & Parsons 2015).

Two models have competed: a Neolithic model as based on the presence of low intensity food-production at Later Stone Age sites predominantly characterised by hunting and gathering and that which sees the cultural diffusion of novel traits among autochthonous hunter-gatherer populations. In southern Africa, social-networks of local exchange or gift-giving are seen as the main mechanism for this spread. The reasoning is based predominantly on the excavated archaeological record. Proponents include Deacon *et al*. 1978; Kinahan (1991, 1994, 1996), Sadr (1998, 2005, 2008a, 2013a, 2013b, 2014, 2015) and Jerardino *et al.* (2014). This competes with a model suggesting a population movement of Khoe-speaking pastoralists into southern Africa around 2300 years ago – this is partially informed by the linguistic identification of an East African proto Khoe-Kwadi speaking population acting as a potential donor source for the spread of early livestock coupled with the archaeological evidence (Güldemann 2008). The main proponent is Smith (1990, 1993, 2006, 2008, 2014, 2017). More recent work acknowledges that both processes were taking place (Sadr 2015, Lander & Russell (Chapter 6)) - although this is not a new thought as in 1978, Deacon *et al.* (1978) noted:

> The process is therefore seen as a gradual acculturation of some, but not all, bands of hunter-gatherers, together with the physical movement of

people, their customs and their stock from northern Botswana to the southern Cape.

In a model which accommodates both processes, Sadr (1998, 2008a, 2015) favours a later first millennium AD movement of Khoe-speaking pastoralists into southern Africa by matching their presence to lugged pottery, backed-rich tool-kits, and a greater proportion of cattle and sheep remains in the faunal assemblages at sites (Sadr 2003, 2008a, 2014, 2015). It is these groups, that he links to the Khoe-speaking herders seen during the early part of the 17th century on the coast of the southwestern Cape (Raven-Hart 1967).

3.2.2 How has the archaeology been used to identify cultural diffusion?

By the latter part of the 1970s, thoughts about cultural diffusion were starting to take over from migrationist theories. Excavations by Deacon *et al*. (1978) and Schweitzer (1970) on the southern Cape coast and later by Kinahan (1984, 1991) in the Namib of Namibia realised that the appearance of novel traits – livestock, predominantly sheep remains, and pottery – appeared within pre-existing Later Stone Age assemblages at sites. For example, Deacon *et al.* (1978: 39) note that "The clustering of radiocarbon dates from archaeological sites in the southern Cape primarily reflects established rather than transitory populations and it is thus difficult to test any hypotheses that take in relatively rapid movement."

The absence of a synchronised package of livestock and pottery at sites suggested cultural diffusion rather than migration (Schweitzer 1970, 1979; Webley 1992, 2002; Kinahan 1991; Webley *et al.* 1997; Orton *et al.* 2013). This asynchronous appearance was later confirmed by Sealy and Yates (1994, 1996) study on directly dated sheep remains from key livestock bearing sites such as Blombos Cave (Henshilwood 1995), Die Kelders (Schweitzer 1970, 1979); Kasteelberg (Smith 1987) and Spoegrivier (Webley 1992, 2002). They found that at some sites sheep remains were much younger than the deposits from which they derived (i.e. at Kasteelberg and Die Kelders) whilst at other sites, sheep bone was older than the pottery from the same stratigraphic unit (i.e. Spoegrivier and Blombos Cave).

Peculiarly, whether or not pottery might have been intrusive to older layers too, was not explored.

Sadr (1998) concludes that the absence of a package of novel traits threw out migration as an explanation for the initial spread. At around this time, Mazel (1992) and Mitchell (1996) drew attention to a small assemblage of pottery recovered from hunter-gatherer sites located on the southeastern side of southern Africa that had remarkable similarities to pottery recovered from sites in the southwestern Cape. None of these sites contained livestock (Mazel 1992).

To interrogate the archaeological evidence further, Sadr and Sampson (2006) tested the hypothesis for a stylistic-chain of early pottery (characterised as well-fired, thin-walled and mineral-tempered); if found, it would support a migrationist argument. Such an approach was already well established amongst Iron Age archaeologists in attempts to trace phylogenetic connections between pottery styles and Bantu-languages (Huffman 1970, 1980, 1989, 2007; Vogel 1973; Phillipson 1977; Evers 1988; Whitelaw 1993, 1994a, b, 1996; Whitelaw & Moon 1996). Sadr and Sampson's (2006) analysis of early Later Stone Age pottery which was based on decoration and stylistic attributes (not functional traits), suggested that the absence of a stylistic-chain supported an *in-situ* technological innovation among local hunter-gatherers. The appearance of a different type of pottery (grass/fibre-tempered, bowl-shaped and thick-walled vessels) recovered from surface finds and excavated shelters from the Zeekoe River Valley of the central interior of South Africa, dating to approximately the same time as the first appearance of mineral-tempered ware, were taken as further support for the regional production of ceramics (Sadr & Sampson 2006). Traditionally, grass-tempered pottery has been associated with hunter-gatherer manufacture (Sampson 1988; Hart 1989; Bollong *et al.* 1993; Sampson & Vogel 1996). Sadr and Sampson (2006: 235) conclude:

> It seems unlikely that the thin-walled wares in southernmost Africa represent a residue of some mass human migration in the distant past. It is more likely that the art of making fired clay pots reached the subcontinent

> through archaeologically invisible infiltrations by small groups, perhaps peripatetic artisans; or it may have been invented locally.

This is further explored in Chapter 6.

Sadr (1998: 128) suggest that sites containing domestic faunal remains are better identified as 'hunter-herder' sites (cf. Smith 1990).

3.2.3 How has the archaeology been used to identify demic diffusion?

Cooke (1965) proposed that the distribution of painted sheep imagery in northern Zimbabwe alongside the discovery of Bambata pottery excavated by Jones (1940) could be correlated with a migration of pastoralists. He suggested a route of spread beginning in northern Zimbabwe, moving to central Botswana and west into Namibia, and then southwards along the coast, eventually reaching the southwestern Cape. Cooke's (1965) hypothesis was at odds with the route suggested, on linguistic evidence, by Westphal (1963). This proposed that the origin for proto Khoe-speakers was in north central Botswana. Sheep paintings, the original basis for a migrationist interpretation, were soon forgotten as archaeologists turned to the excavated archaeological record in this debate.

The migration hypothesis in southern Africa, until the genetic findings were published, was largely theoretical (Smith 1990, 1998, 2006, 2008, 2017). Smith (1991) sees the transition of southern African hunter-gatherers to livestock-keepers as impossible due to 'ideological constraints'. He stresses the differences in social practices and relations found in hunter-gatherer and herding societies (Table 3.1). Concepts relating to ownership, the control and dominance over animals, and hierarchical social structures, are seen as limitations to a hunter-gatherer ability to make such a transition (*ibid*). If southern African hunter-gatherers did make this transition, then preconditions relating to the uptake of livestock-keeping would already need to be in place (Smith 1990; 1992). Part of the precondition requires hunter-gatherers to be in the ambit of food-producers (Smith 1990, 2017).

Table 3.1. A break-down of the differences in the social organisation of hunter-gatherers and pastoralists (adapted after Barnard 2008: 66, Table 3).

Hunting and Gathering	***Herding***
No property to inherit	Inheritable property
Bilateral kinship and group structure	Lineages and clans
Band organization	Clan-based settlement
Seasonal aggregation and dispersal	Transhumance or clan migration
Egalitarianism	Social hierarchy

In the archaeology, Smith *et al.* (1991) see two types of sites that can be distinguished by the type of economy practiced by the occupants. The first category of site is linked to herders and the assemblages are characterised by informal stone tools; large ostrich eggshell beads; a high pottery index and a high domestic faunal count relative to wild bovid counts. The second type of site, attributed to hunter-gatherers, contains a formal retouched stone tool assemblage; small ostrich eggshell beads; a low pottery index and a high percentage of wild faunal remains in comparison to that of domestic stock. Using these criteria, sites such as Witklip are thus identified as hunter-gatherer whilst Kasteelberg A and B are seen as pastoralist (Smith *et al.* 1991).

The problem is that Smith *et al*. (1991) use a criterion that rarely works in other regions of southern Africa. A further and different interpretation of the archaeology was made by Schrire (1988) and Schrire and Deacon (1989) who see in all these site types a very similar cultural group in a single economic system - those with livestock and those without – all along a continuum. Both Webley (1992, 2002) and Orton (2012, 2017) found it extremely difficult to distinguish two economies at sites in Namaqualand. Orton (2017: 87) using the criteria set out by Smith *et al.* (1991) and his divisions of artefacts into three separate lithic groups concludes that: "It thus appears that, pending further evidence, we cannot yet understand who, by ethnicity or economy, made which assemblages". The database work presented in Chapters 4 and 6 explores this further.

Smith's (2017) analysis of lugged pottery dating to around 1200 years ago (BP) from Kasteelberg in the southwestern Cape leads him to suggest a broad link to an earlier 1800-year-old (BP) spouted pottery assemblage recovered from the same site. Given that they are all manufactured in the same way, coil-built, mineral-tempered, well-fired and display shoulders and have rounded bases, he argues that a later migration as proposed by Sadr (1998, 2003) does not explain this type of continuity. He also sees that stylistic differences in pottery cannot be used to explain cultural diffusion as the majority of mineral-tempered vessels found at sites across southern Africa all appear to be undecorated (Smith 2008).

3.3 The spread of early farmers into southern Africa, 1800 years ago.

A single demic diffusion model has predominated in the explanation for the arrival of agropastoralists (also referred to as the Iron Age[1]) in southern African. This largely follows the genetic phylogeny of Bantu-language dispersals in Africa (Bostoen 2018). In southern Africa, the model suggests that agriculturists, rather than developing local cultural innovations, would have followed familiar habitats in summer rainfall areas (>400mm), along predominantly open woodland savannah ecotones, preferably fertile river valley bottoms, and littoral patchy forested corridors (Maggs 1980, 1984; 1994/5; Hall 1981; Feely 1987; Sinclair 1987; Morais 1988; Vansina 1995; Russell & Steele 2009; Currie *et al.* 2013; Boestoen *et al.* 2013; Boestoen *et al.* 2015; Grollemond *et al.* 2015). It is suggested that these groups were patrilineal cattle-keepers (Huffman 1993, 2007). The arrival of farming and southeastern Bantu-language speakers is commonly understood to be marked by an archaeological 'package' of multiple traits that co-occur on the landscape (Huffman 2007). This package includes: pits, grain bins, domestic livestock bones, pole-*daga*-fragments, grindstones, metal working and thick-walled ceramics (*ibid.*). It is in this context that it is suggested that the first indigenous

[1] The term 'Iron Age' used here refers to the research conducted within the last five decades in the context of the arrival of agriculture and mixed farming. The term has been suggested to misrepresent the archaeological interpretations of the complex lifeways of these communities with an ethnocentric overtone (see Maggs (1992) and Parkington and Hall (2012)). For this reason, the term is used sparingly in this chapter and only refers to the research conducted and not past communities.

domestic African cereals such as sorghums and millets were brought into southern Africa.

Further north in Zambia, there are differences in the package of traits that are linked to the farming communities of west Central Africa (de Maret 2013), these are: metal working, a preponderance of iron hoes, copper crosses alongside sub-rectangular *daga*-pole structures. This is unique and different to the 'package' identified by Huffman (2007) on the southeastern side of the subcontinent (De Maret 1982, 2013; Blench 2014).

Some debate exists between geneticists, linguists and archaeologists as to whether Bantu-language dispersals, in their entirety, can be coupled with the movement of people and/or cultural traits (Gramly 1978; Maggs 1984; Hall 1987; Pakendorf *et al.* 2011; Sikora *et al*. 2011). More specifically, it is unclear whether a complete Iron Age archaeological 'package' does co-occur with the movement of Bantu-language speakers (Vogel 1973; Maggs 1984; Hall 1987; de Maret 1994/5, 2013; Vansina 1995, 2006). If such traits are found not to co-occur, the possibility arises that local adoption, cultural borrowing and innovation were also involved in the spread process. This is explored in chapter 4.

3.3.1 Were early crop farmers also livestock-keepers?

Hall (1988) postulated whether early farmer coastal midden sites in KwaZulu-Natal might be made by local hunter-gatherers rather than farmers. Both appear to have exploited shell-fish and neither kept livestock. At early agriculturist sites in Mozambique such as Silver Leaves, Matola and University Campus there is also no evidence of livestock (Klapwijk 1974; Silva and da Cruz 1977; Sinclair *et al*. 1987; Morais 1988; Klapwijk & Huffman 1996). Their absence is often explained as a result of poor preservation and cultural practice (Sinclair *et al.* 1987; Huffman 2007).

For the spread of cattle-keeping amongst Bantu-language speakers, two thoughts have prevailed. The first, proposed by Phillipson (1977), was the idea that cattle

and associated cattle-keeping practices followed the Western Stream/Kalundu Branch of the spread of Bantu-language speakers. It was proposed that Kalundu agriculturists introduced cattle to the Eastern Stream/Kwale Branch agriculturists who initially practiced agriculture without cattle-keeping. Huffman (1990, 1993, 1998; 2001) has since rejected this view. Based on the reanalysis of ceramics at the early farmer site of Broederstroom in South Africa, Huffman (1993) argues that the Eastern Stream people were also cattle-keepers. The reassignment of Broederstroom pottery from a western to an eastern source allows Huffman (1998) to interpret the archaeology of such sites using the Central Cattle Pattern (CCP) that he attributes to patrilineal *southeastern* Bantu-language speaking populations. The CCP model is derived from an historic and ethnographic context observed amongst Sotho-Tswana and Nguni groups (Huffman 1993, 1998, 2007). The main principles of the CCP model lies in the social organization of Eastern Bantu-language speakers, particularly with rules governing affinal descent – that they are patrilineal and patrilocal. The archaeological reasoning behind this reassignment are not clear.

The validity of the application of the CCP model is questioned by a number of archaeologists (Lane 1994/5; Segobye 1998; Holden & Mace 2003, 2005; Badenhorst 2010; Fredriksen & Chirikure 2015). A criticism is that the model provides a static and unchanging view of farming communities from present to past (see for instance: Hall 1984; Chirikure 2005; Fredriksen & Chirikure 2015). Holden and Mace (2003) suggest that the absence of livestock at early farming sites might reflect a different type of social organisation such as one based on matrilineal affinal relationships. This is explored with archaeological data in Chapter 4.

3.3.2 The use of pottery assemblages to document the spread of Bantu-language speakers.

The spread of Bantu-language speaking agriculturists in Africa is commonly traced by using pottery typologies (Huffman 1970, 1980, 2007; Phillipson 1977). Similarities in style (decoration placement) and vessel form (shape) in pottery assemblages are used to build sequences or 'stylistic chains' traced over space and time and linked, controversially, to speakers of a particular language group (*ibid*).

Both Phillipson (1977) and Huffman (1980) have advocated this approach, arguing that both Eastern and Southern Africa share a common stylistic repertoire which they identify as deriving from a single complex, the Chifumbaze Complex. This complex grew out of the Great Lakes region beyond the central African rainforest and derives from a source referred to as Urewe (Huffman 1970, 1980; Phillipson 197)7. In this typological scheme both Phillipson (1976) and Huffman (1980, 2007) see connecting styles of pottery that could be divided into an Eastern and Western stream (Fig. 3.1). The Western Stream associated with the Kalundu branch, is suggested to have its origins in northern Angola, at the type site of Benfica. The Eastern Stream, associated with the Kwale branch, derives from East Africa. Huffman (1980, 2007) further proposes a Central Stream referring to the stylistic traits of pottery and naming it the Nkope branch. Phillipson (1977) did not separate the Nkope from the Kwale branch. It is suggested that Western Bantu-language speakers are connected with the Naviundu ceramic tradition (de Maret 2013).

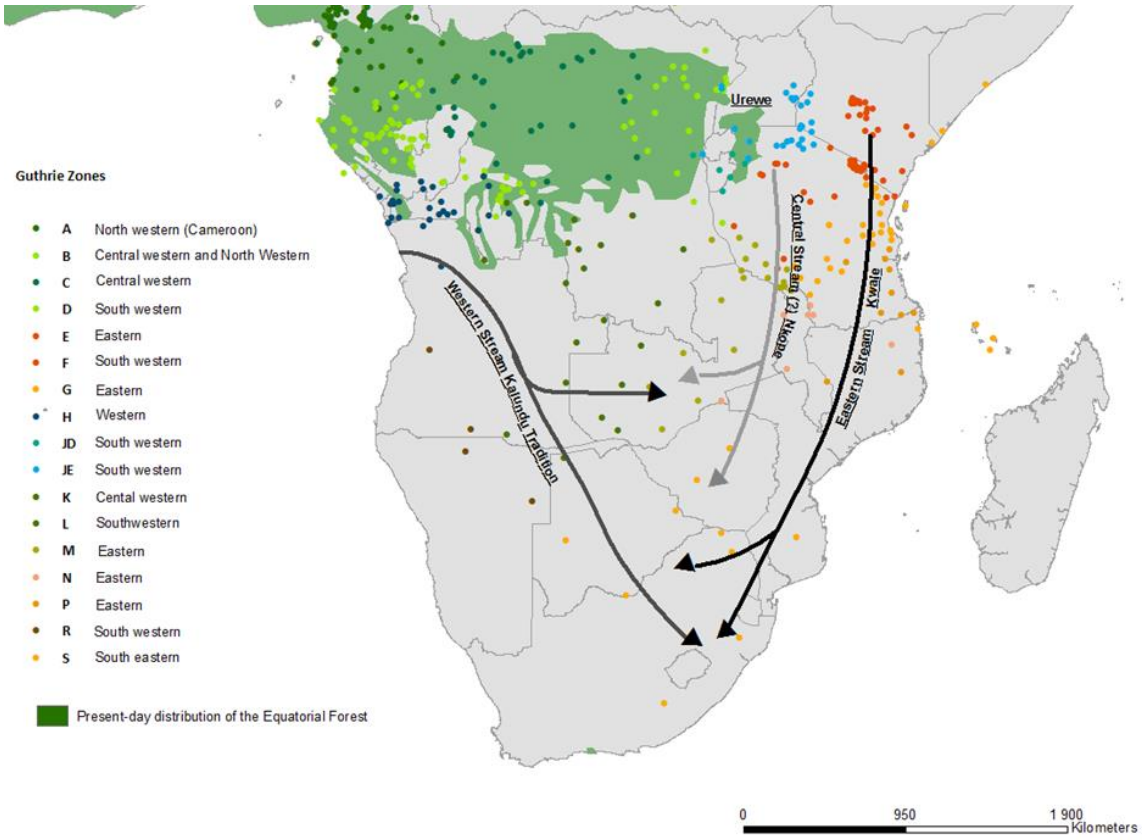

Figure 3.1: Distribution of Bantu-languages overlaid by the three streams as identified by Huffman (2007) and Phillipson (1977). Data points derive from Grollemund *et al*. (2015).

Despite its many critics (Hall 1984; Pikirayi 2007; Ashley 2010; Dores-Cruz 2011), this typological approach, introduced nearly four decades ago, remains the dominant model for the spread of agriculture with Bantu-language speakers. This approach has been particularly important in regions where there is uneven archaeological coverage (Pikirayi 2007). But as Pikirayi (2007: 288) noted:

> A major limitation with African Iron Age archaeology in general is the treatment of pottery as if it is the only evidence found on sites, and yet ceramics are only meaningful within a given cultural context. Pottery relates to, and communicates with, other material culture pottery assemblages are not the only material remains of early agriculturist sites yet their use in a wide range of arguments for the lifeways and ideology of its makers has been played out at the expense of critically analysing the rest of the material record.

These concerns are addressed in Chapter 4.

3.4 Limitations and gaps in the current archaeology and its application to understand the spread of novel traits in southern Africa.

I comment on the three limitations which have stimulated my revisit of the archaeological data as presented in this thesis:

i. Reliance on just a few material traits in the debates

Archaeologists have drawn on a small corpus of archaeological traits to identify mechanisms for spread. In the hunter-herder debate, livestock bones and pottery are generally the most represented of the material assemblages, with stone tool assemblages to lesser extent (Deacon *et al.* 1978; Smith *et al*. 1991; Smith 2008, 2017; Sadr 2014, 2015; Orton 2012). Pottery has been a key in identifying farmer sites (Vogel & Katanekwa 1976; Morais 1988; Huffman 1980, 2007; Evers 1988). This focus is perhaps not surprising

given the durability of these items in the archaeological record. But this overlooks other parts of the material record that might be important. To this end the thesis presents the evidence of rock paintings of sheep and organic containers and suggests how they might be interpreted. The painted record is largely overlooked or dismissed (Sadr 2013a). Besides Cooke's (1965) analysis of the distributions of painted sheep imagery, the only other two such studies by Mazel (1982, 2013) and Manhire *et al.* (1986) have both informed and stimulated my analysis of paintings of fat-tailed sheep in KwaZulu-Natal (Chapter 5). Organic remains, particularly ostrich eggshell containers, and their use as markers within the hunter-herder debate are presented in Chapter 6.

ii. The absence of hunter-gatherer archaeologies in the debates

A number of southern Africanist archaeologists have looked at the dynamics between hunter-gatherers, pastoralists and agropastoralists (Parkington & Hall 1987; Mitchell *et al.* 1996; Wadley 1996; Thorp 1997, 2010; Mazel 1998; Hall & Smith 2000; Klatzow 2000; Reid 2005; Jolly 2005; van Doornum 2005, 2008; Mitchell 2009; Hall *et al.* 2013). Yet these are either based on the archaeology of one site or limited in scale. Spatial-temporal analysis at the larger scale in southern Africa has overlooked hunter-gatherer archaeology. In Chapters 5 and 6 I attempt to re-dress this imbalance by mapping hunter-gatherer material culture and responses to the presence of novel traits on the landscape.

iii. The nature of the archaeological record and its implications for documenting past spread events.

Archaeologists tend to present cohesive accounts of the spread of farming and pastoralism, glossing over the gaps that occur in the archaeology. I have mentioned that the direct dating of livestock bones has changed the hunter-herder debate (Sealy & Yates 1994, 1996). Similarly, Horsburgh *et al*.

(2016) have questioned whether morphological identifications of sheep remains are accurate, suggesting that genetic profiling is the only secure way of identifying these remains in the archaeology (cf. Horsburgh *et al.* 2015; Horsburgh *et al.* 2016; Plug 2018; Scott & Plug. 2019).

A reason for compiling the archaeological databases for this thesis was to interrogate the nature of the archaeological data by including information on stratigraphic integrity, reliability of radiocarbon determinations, contextual associations between the material assemblages and the type of assemblages reported for each site. Importantly, the databases were created to allow for this detail to be read at large-scale analyses. I address this work in Chapters 4, 5 and 6.

Chapter 3 PART TWO: The role of genetic research findings in the hunter-herder debate in southern Africa

3.5 Introduction

In this chapter, I review the genetic research that I suggest is changing the nature of debate within southern Africanist archaeology. In southern Africa, research surrounding the origins of the lactase persistence gene is steering archaeological interpretations within the hunter-herder debate to ones that give primacy to migration as an explanation for change.

3.5.1 Assessing the genetic data

A georeferenced dataset of genetic research was compiled as part of this review, which I have named, 'The Lactase Persistent Genetic Dataset' (Dataset 1). It is a georeferenced list of all present-day southern African populations whose chromosomes have been tested for the lactase persistence trait. Here referred to as LP for Lactase Persistence, LNP for Lactase non-persistent (after Tishkoff *et al*. 2007) and LDC for low digestion capacity (after Holden & Mace 2002). The presence or absence of the Lactase Persistent -14010*C mutation amongst present-day southern African populations is significant as it suggests a likelihood for the presence of a proto-historic fresh-milk drinking among adults in pastoral population in southern Africa, as well as a biological connection between southern African pastoralism and an East African source population (Breton *et al.* 2014; Macholdt *et al.* 2014). For this reason, a similar East African geo-referenced genetic dataset is presented for comparison to the southern African LP genetic dataset.

The data captured here are plotted onto maps alongside the tabulated dataset information presented in Appendix 2. The methods used to compile the genetic dataset is outlined in Appendix 2.

3.6 The milk digestion trait (The Lactase Persistence Genetic Dataset, Dataset 1, Appendix 2)

Geneticists are increasingly finding biological evidence for the movement of livestock into southern African with a parental population with a non-Bantu language-speaking East African pastoralist source (Breton *et al.* 2014). Of importance in this identification is the presence of the Lactase Persistent (LP) allele - a genetic trait that is attributed to adult populations who have the ability to break-down milk lactose during digestion. The LP gene is found in just a few of the world's populations and only 3.6 percent of Africa's populations contain the enzyme (Ingram *et al.* 2009) (Fig. 3.2).

Importantly the presence of the LP mutation may reflect a deep-ancestral link with domestic livestock-keeping practices and related human-domestic-animal relationships (Tishkoff *et al.* 2007; Scheinfeldt *et al.* 2010). Its presence among populations opens up questions about the type of specialized pastoralism that may have been practiced in the past. The LP mutation may reflect the specialized practiced referred to as 'milch pastoralism' (Ingold 1980), wherein pastoralists use their livestock for milk rather than meat (c.f. Holden & Mace 2002).

The lactase persistence trait occurs in higher frequencies in East African pastoral populations who mostly occupy more arid regions where water is often substituted in the form of livestock milk (Holden & Mace 2002) (Fig. 3.2). Some agropastoral and hunter-gatherer groups carry this genetic trait, albeit at much lower frequencies.

*3.6.1. Lactase persistence allele -14010*C: connecting southern African pastoralists to East African populations*

In southern Africa, 52 ethnic population groups have been screened for the LP mutation (Table 3.2). Of these populations, 29 are Bantu language-speaking with 16 belonging to the northern Khoesan speaking cluster (Coelho *et al.* 2009; Tornianen *et al*. 2009; Breton *et al.* 2014; Macholdt *et al.* 2014; Jones *et al.* 2015; Pinto *et al.* 2016). The geographical coverage of these populations is patchy but

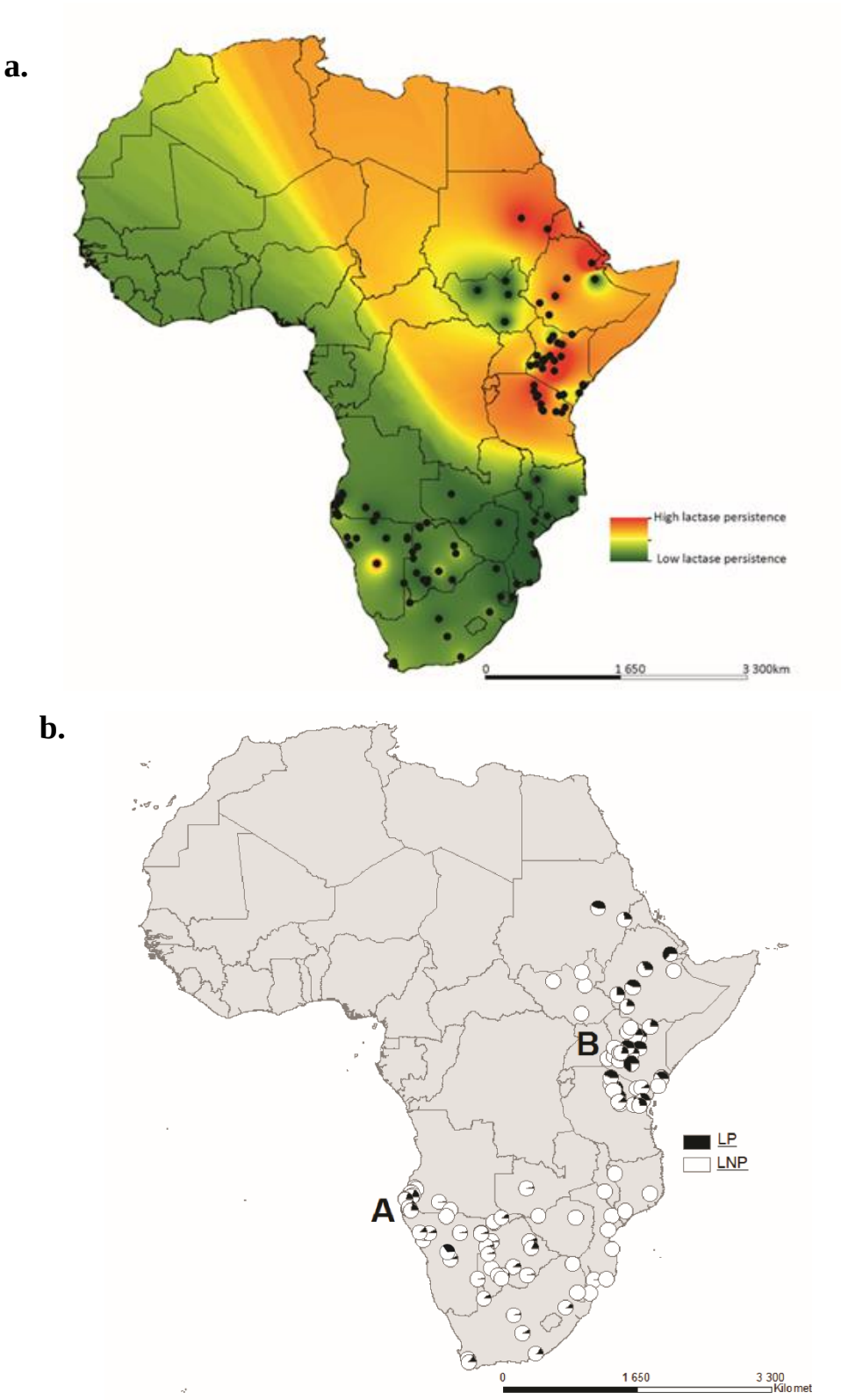

Figure 3.2. Interpolated map (a) showing the distribution of modern East and Southern African populations screened for the lactase persistent trait. High frequency of LP is shaded in red, relative LP frequency shaded in yellow and non-digestors shaded in green. Note that West, North and Central Africa was not used in this interpolation. Map (b) shows relative frequency of LP population phenotypes for east and southern Africa. Dataset 1, Appendix 2.

includes parts of Angola, Namibia, Botswana, Zambia, Swaziland, Mozambique and South Africa (Table 3.2 and Fig. 3.3).

According to the global lactase persistence frequency data, southern African populations fall within a low frequency LDC (Fig. 3.3 and Dataset 1, Appendix 2). In comparison, East African populations show greater frequencies of LP with a far greater number of populations having been phenotyped. For example, 108 East African ethnic groups have been screened so far for the LP trait (Table 3.3 and Fig. 3.4). The presence of the LP gene in southern African populations is significant when considering the biological spread of pastoralism into the region (Holden & Mace 2002).

Table 3.2 A summary of modern southern African population statistics based on the selected published genetic Lactase Persistence (LP) tests. Dataset 1, Appendix 2.

	Number of ethnic groups	*Regions*	*Bantu-language speaker**	*Khoe-speaker**	*Non-Khoe**	*Other**	*Source*
	13	South Africa, Namibia, DRC	3	5	3	2 [Afrikaans]	Breton *et al.* 2014
	18	Botswana, Namibia, Zambia	7	11	7	-	Macholdt *et al.* 2014
	1	South Africa	1	0	0	0	Tornianen *et al.* 2009
	12	Angola, Mozambique	11	0	1	0	Pinto *et al.* 2016
	4	Angola	4	0	0	0	Coelho *et al.* 2009
	1	Swaziland	1	0	0	0	Segal *et al.* 1987
	3	Mozambique, Malawi, Namibia	2	0	1	0	Jones *et al.* 2015
Total	**52**	-	**29**	**16**	**11**	**2**	-

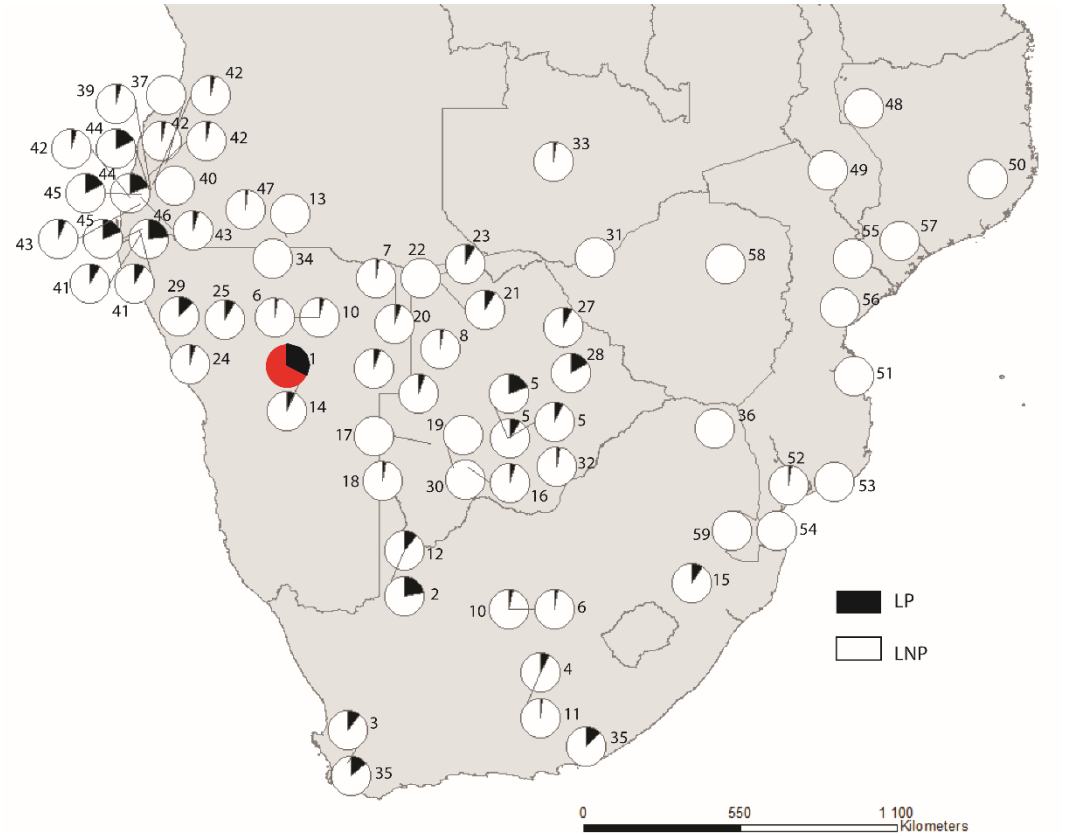

Figure 3.3. Distribution of modern southern African populations so far screened for the LP phenotype and the associated frequencies of lactase persistence (represented as black on symbols). Red symbol represents the Nama (1) population. Numbers on the maps represent the database code for each ethnic group. Dataset 1, Appendix 2.

Table 3.3 A summary of modern East African population statistics based on the selected published genetic Lactase Persistence (LP) tests. Dataset 1, Appendix 2.

	Number of ethnic groups	*Regions*	*Bantu-language speaker*	*Khoe-San speaker*	*Nilo-Saharan*	*Afro-Asiatic*	*Source*
	17	Ethiopia, Sudan, Tanzania	1	0	4	12	Jones *et al.* 2015
	43	Tanzania, Kenya, Sudan	5	2	21	15	Tishkoff *et al.* 2007
	1	Ethiopia	0	0	0	1	Ingram *et al.* 2009a
	47	Kenya, Sudan, Tanzania	9	2	20	16	Ranciaro *et al.* 2014
Total	**108**	-	**15**	**4**	**45**	**44**	-

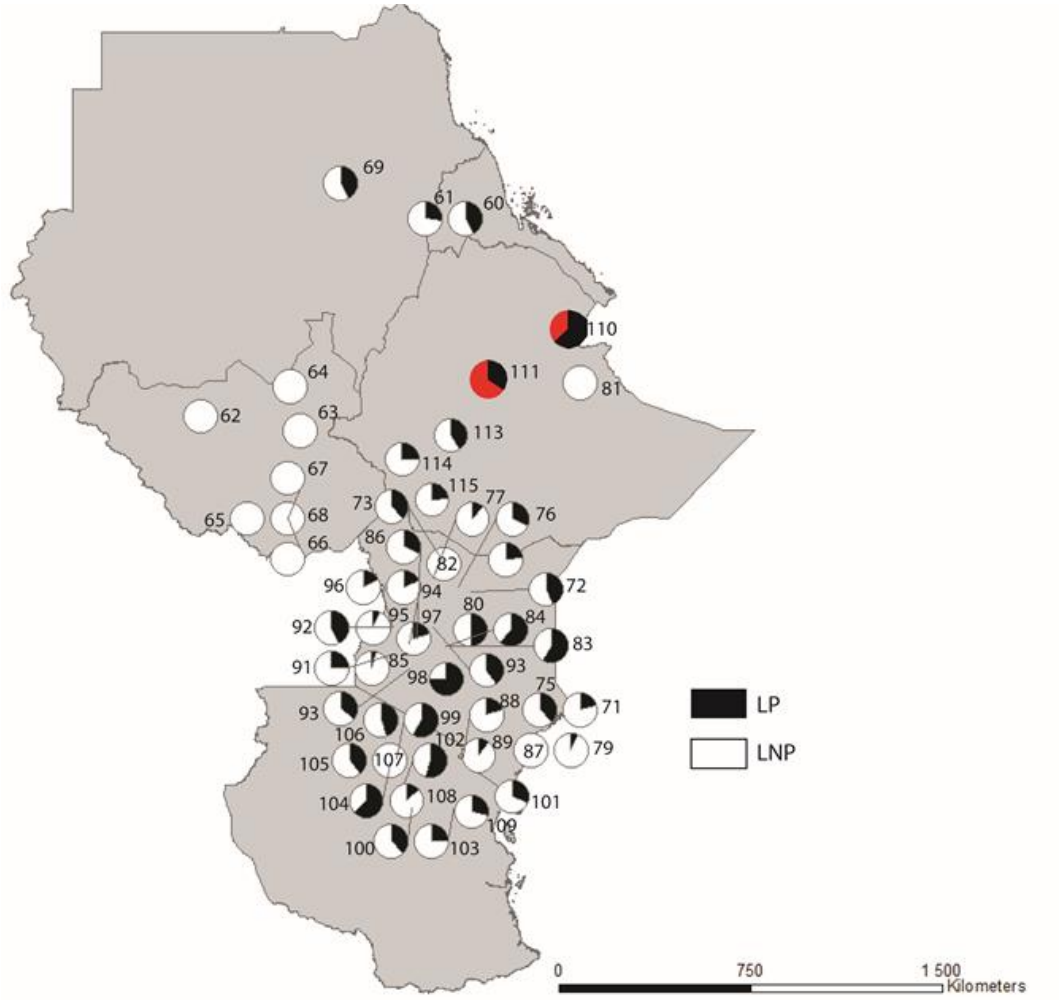

Figure 3.4. Distribution of modern East African populations so far screened for the LP phenotype and the associated frequencies of lactase persistence (represented as black on symbols). Red symbols represent the Afar (code 110) and the Amara (111) populations. Numbers on the maps represent the database code for each ethnic group. Dataset 1, Appendix 2.

Further patterns suggest that most southeastern Bantu language-speaking agropastoralists are non-lactose-digesters (LNP). For example, populations coded 30, 31, 36 and 40, 48-51 and 53-58, the majority of whom occupy the summer rain-fed regions of the eastern part of southern Africa (Fig. 3.3, Dataset 1, Appendix 2). There are however a few outliers suggesting a more complex history of genetic diversity and perhaps a degree of cultural-borrowing. For example, the southeastern Bantu language-speaking Xhosa agropastoralists (code 35) of the eastern and western Cape have a 12.8 to 14.3 percent of the -14010*C LP variant (Breton *et al.* 2014). The presence of this trait amongst the population has been attributed with a long history of intermarriage with click-language speaking Khoe and San

populations (Barbieri *et al.* 2014). Mitochondrial DNA with the presence of *L0d* within the Xhosa population further suggests a likely admixture with Khoe and San populations (*ibid.*).

In the drier western half of southern Africa, it is the Khoe-speaking Nama pastoralists (code 1, Fig. 3.3) who contain the highest frequency of the LP -14010*C variant at 37.5 percent (Breton *et al.* 2014; Macholdt *et al.* 2014). This frequency is closely followed by 22.5 percent traced amongst the Askham Coloured population (code 2) of the Northern Cape who has ancestral and linguistic ties with Khoe-speaking Nama and Damara groups. Of the non-Khoe speaking hunter-gatherer populations, the Ju|hoan (code 9) and !Xuun (code 20) show a relative LP -14010*C frequency of 5.8 and 3.8 percent respectively (Breton *et al.* 2014; Macholdt *et al.* 2014) (Fig. 3.3, Dataset 1, Appendix 2).

It is the Nama population, however, who have come to represent a genetic link in the chain of demographic movement from East to southern Africa. This population has been identified as containing 10 to 15 percent East African ancestry (Schlebusch *et al.* 2016). Y-chromosome data suggests a potential gene flow of 1200 to 2700 years ago (Henn *et al.* 2009; Breton *et al.* 2014). Based on the LP gene data, this link has been proposed to date to 1300 years ago (BP) based on the small amount of Bantu language-speaking admixture found in the Nama and East African parental population(s). Here, three parental populations are considered as a potential source – the Afar (code 110), the Amhara (code 111) and the Tigray of northern Ethiopia (Breton *et al.* 2014: 856) (Fig. 3.4, Dataset 1, Appendix 2). Both chronometric dates offered by Henn *et al.* (2009) and Breton *et al.* (2014) seem to show relatively broad time scales for gene flow. The 1300-year date, has been suggested to support a late first millennium migration model for pastoralist populations into southern Africa, a model initially presented by Sadr (2003) based on archaeological evidence from the southwest coast of southern Africa. Archaeological sites during this time period include Jakkalsberg A and B, situated in the homeland of the Nama population, and dating to 1300 years ago (Webley 1997) (see Chapter 6 findings for a different interpretation for this site). The sites are characterized with a high number of livestock bones (*ibid.*). Further south, on

the Vredenburg Penninsula of the Western Cape, Kasteelberg B site, occupied around cal AD 1200 has been identified as a meat-feasting location and attributed with a social hierarchy that is distinguishable from ethnographically observed southern African Kalahari hunter-gatherer groups (Sadr 2004, 2019). These sites, although dating roughly to a similar time frame as the genetic data, are exceptions rather than the rule. Most archaeological sites of this time period having low livestock bone counts.

3.7 Variation in the Lactase Persistence data: the current gaps

The LP genetic data reveals a vast amount of variation amongst present-day populations and it is for this reason that it must be contextualized within the debates that surround demographic movements in the archaeology. Three limitations are stressed here: (1) the practice of milk-drinking amongst present-day populations who have low or no lactase digestion capacity but still drink milk, (2) present-day genetic population sampling strategies represent a tiny fraction of the population total and (3) the calibration of the timing for genetic divergences is imprecise and poorly explained.

3.7.1 Milk-drinking: variation in biology and cultural-practices.

Currently the genetics of lactase digestion supports its co-evolution with the cultural phenomenon of fresh-milk drinking amongst African pastoralist populations. However there is data to suggest that some pastoralist groups who practice milch pastoralism do not have the lactose digestion gene. For example, two southwestern Savanna Bantu-language speaking populations, the Herero (code 13) and Himba (code 29) are heavily reliant on a pastoral economy and have a low lactose-digestion capacity ranging from 0 to 12.5 percent (Fig. 3.3, Dataset 1, Appendix 2) (Coelho *et al.* 2009; Torniainen *et al*. 2009; Breton *et al.* 2014; Macholdt *et al*. 2014). Similarly, this trait is absent amongst Nilo-Saharan cattle pastoralists, the Dinka (code 62) (Tishkoff *et al.* 2007) of southern Sudan (Fig. 3.4, Dataset 1, Appendix 2) who keep cattle, slaughter cattle reluctantly and use milk and blood as substitute for water as well as for number of other important social and ceremonial reasons

(Holden & Mace 2002; Russell 2013; Russell & Lander 2015). Like the Herero and the Himba, the Dinka livelihood centres on their herds. The consumption of milk even amongst non-digesters may equally be informed by environmental constraints and biologically non-related cultural practices (Holden & Mace 2009). As Henn *et al*. (2008: 10697) recognise:

> Although genetic data can be a powerful tool for inferring past human migrations, the additional inference of cultural processes associated with migration will always be more tenuous because culture is necessarily decoupled from the genes.

The consumption of sour or fermented milk has been largely underestimated in the LP genetics of populations. It is well known that a large portion of Africa's population consumes soured milk (Bryant 1967; Segal *et al.* 1983; Kimonye & Robinson 1991; Abdelgadir *et al.* 1998; Beukes *et al.* 2001; Gonfa *et al.* 2001; Gadaga *et al.* 2013). For example, in the sourveld region of the Eastern Cape, Xhosa speaking cattle farmers and related household kin consume up to 2.3 litres of sour milk per day (Mapekula *et al.* 2009) (see also Masika and Mafu (2004) for a small group of Xhosa goat-raisers who produce and consumer fermented goat milk). Khoe pastoralists were also known to produce and drink fermented milk (Lombard & Parsons 2015). One of the key elements influencing the quality of fermentation in milk is the vessel used (Bohme 1976; Kebede *et al*. 2007). Generally, vessels made of grass, wood, gourd and animal skin bags are the most common forms known today and historically. Clay pots were also used (Kebede *et al.* 2007). The lactose found in fresh cows' milk is substantially lower than in that found in human milk but once fermented it is one-third lower in lactose content (Schaafsma 2008).

3.7.2 Sampling the genetic diversity of southern African populations

The geography of populations may also have further implications for how genetic heterogeneity is explained. Pinto *et al.* (2016) analysis of LP mutation amongst the Herero population sample in Kuvale, Angola recorded a relative frequency of 6%.

This contradicts the findings of Breton *et al.* (2014) who found no LP mutation amongst their sample group of Namibian Herero. This may have as much to do with environmental factors shaping the genetics as it is with the population sample size (see for instance, Pakendorf *et al.* 2011). It is often cited that southern Africa is one of least genetically sampled regions in Africa (Sikora *et al.* 2011). The Nama, represent a single population group out of a number of Khoe-speakers that are thought to have occupied the landscape (Güldemann 2008; Ehret 2008). A 2011 population census identifies over forty-seven thousand Nama living in South Africa (Statistics South Africa 2011). This number compared to the minute genetic sample – just 22 individuals that were counted in this review - raises questions about how representative the lactase persistent trait is for the entire population.

3.7.3 How reliable is the genetic clock?

The timing of genetic contributions in southern Africa population groups is imprecise and poorly explained by geneticists. For example, Henn *et al*. (2008) provide broad timeframes: "Genetic estimates indicate that gene flow between eastern and southern populations most likely occurred between 1,200 (credible region bounded by 40–5,000 ya) and 2,700 years ago (SE bounded by 1,600–3,800 ya)" (ibid: 10697). Similarly, Breton *et als.* (2014) estimate of a 1300-year (BP) introduction of admixture with the lactase persistent allele amongst southern African populations is much later than the archaeological evidence for the initial appearance of livestock and pottery. Their findings support a later migration as suggested by Sadr (2003, 2008a) based on the archaeology (see Section 3.2.1).

3.8. The use of genetic data as a source for identifying migration in the archaeology: implications.

Between 1990 and 2008, the hunter-herder debate had reached an impasse (c.f. Russell & Lander 2015). Recent genetic findings are once again allowing archaeologists to see migration as the most likely explanation for change. These

shifts are seen in the archaeological discipline. For example, Sadr (2019: 90) suggests:

> The debate now has been resolved with archaeological, genetic, and linguistic data. These show that both immigrant Khoe speakers from the northeast and northern San hunter-gatherers were involved in the sporadic, gradual spread and adoption of livestock in southern Africa.

For Smith (2017:415), a major proponent for an early Khoe pastoralist migration, the idea that local southern African foragers could simply not make the leap to livestock-rearing has been reinvigorated.

The difficulty of connecting multi-disciplinary sources has been noted by many (MacEachern *et al*. 2000; Eggert 2005; Blench 2006, 2013, Blench *et al.* 2008; Scheinfeldt *et al.* 2010; MacEachern 2013; Pakendorf *et al.* 2011; Mitchell 2011). The challenges stem from gaps and limitations in both the archaeological record (as discussed in Section 3.4) and in the genetic data (as discussed in Section 3.7). Both deal with different types of data that are patchy in their geographical coverage and temporal scope. Archaeologists and geneticists struggle to understand the others' data and its limitations.

The current popularity of migration pushes aside the southern African hunter-gatherer populations and their place in the history of this region. In light of these developments it became increasingly important to revisit the archaeology and to evaluate the archaeological evidence for this spread, independently of the genetic work. This is reflected in work presented in Chapters 4. 5 and 6.

Chapter 3 PART THREE: Assessing the role of the linguistics in understanding the spread of novel traits

3.9 Introduction

The dispersal of languages is often seen as synonymous with the spread of novel traits. One of the longstanding practices in archaeology has been the identification of a particular language group by its material culture (Phillipson 1977; Ehret & Posnansky 1982; Vansina 1995; Pikirayi 1999, 2007; Eggert 2005, 2016; Blench *et al*. 2008; MacEachern 2012). This method has been particularly popular in attempts to understand the dispersal of Bantu-languages and farming into southern Africa (Fagan 1966; Huffman 1970, 1980, 1989, 2007; Vogel 1973; Phillipson 1977; Ehret & Posnansky 1982; Evers 1988; Whitelaw 1994; Vansina 1995; Bostoen 2007; Pikirayi 2007; De Luna *et al.* 2012; Eggert 2016).

I briefly address linguistics because of its use by archaeologists in arguments surrounding demic versus cultural diffusion (Cooke 1965; Huffman 1970; 1980; 2007; Walker 1973; Phillipson 1977; Vansina 1979, 1980, 1995; Ehret 1982; Denbow 1986; Smith 1990, 2008, 2017; Sadr 2003, 2015). Linguistic research largely supports migration as an explanation for change – particularly in the spread of farming connected with Bantu-languages and in the spread of herding and Khoe-language speakers (Bostoen. 2007). As with genetic research findings, archaeologists have used linguistics to trace population movements without critically testing the validity of the linguistic data against the archaeology (Eggert 2005). A possible reason for this is that for non-linguists, the methods used in historical comparative linguistics, are difficult to grasp. Attempts to scrutinize this work requires a specialist linguistic background (c.f. MacEachern 2012). As Heine and König (2008: 235) suggest:

> The main problem lies in the fact that the two disciplines concerned are dealing with entirely different research subjects, and the question of how, for example, the artefacts of the archaeology relate to the phonology of

> syntax of the people in the area where these artefacts have been discovered must of necessity remain to some extent conjectural.

The connections between archaeological evidence and language groups are explored in Chapter 4 where a southern African language distribution map is produced. I introduce the geo-referenced dataset that was used in this mapping exercise with a brief review of linguistic classifications and their role in the hunter-herder debate and the spread of Bantu-language speaking farmers.

3.9.1 Assessing the linguistic data

A geo-referenced linguistic dataset of Bantu-language speakers and Khoesan hunter-gatherer and herder speakers, 'The southern African linguistic dataset for Bantu and Khoesan languages' (Dataset 2), is provided in Appendix 2 of this thesis. The georeferenced data points were plotted using ArcGIS version 10.4 (Fig. 3.5).

The dataset was collated using reference material available online through glottolog.org and ethnologue.com (Eberhad *et al.* 2020). These online language databases provided maps to locate areas of present and past distributions of different language groups. The database covers southern African populations both present and extant, who speak Khoe or other languages belonging to the Khoesan family, as well as Bantu-languages. Additional sources were consulted to corroborate these classifications, for example: Maho's (2003) work covers and revises the linguistic classification of Bantu-languages after Guthrie; Sommer (2003) and Bostoen (2009) focus on western Bantu-languages and Güildemann and Vossen's (2000) and Güldemann's (2008) classifications for Khoesan languages. The methods used to compile Dataset 2 are provided in Appendix 2.

3.10 The classification of African languages (The southern African linguistic dataset (Dataset 2, Appendix 2)

The languages of Africa can be classified into four broad language phyla (or 'mega-families') – Niger-Kordofanian (of which the Bantu-language sub-group belongs), Nilo-Saharan, Afroasiatic, and Khoesan (Heine and Nurse 2000; du Plessis 2017: 2). Two 'mega-families'- Bantu-languages and Khoesan (alternatively spelled Khoisan) are of importance to southern Africa as these languages are implicated with the spread of herding and farming during the beginning of the first-millennium AD.

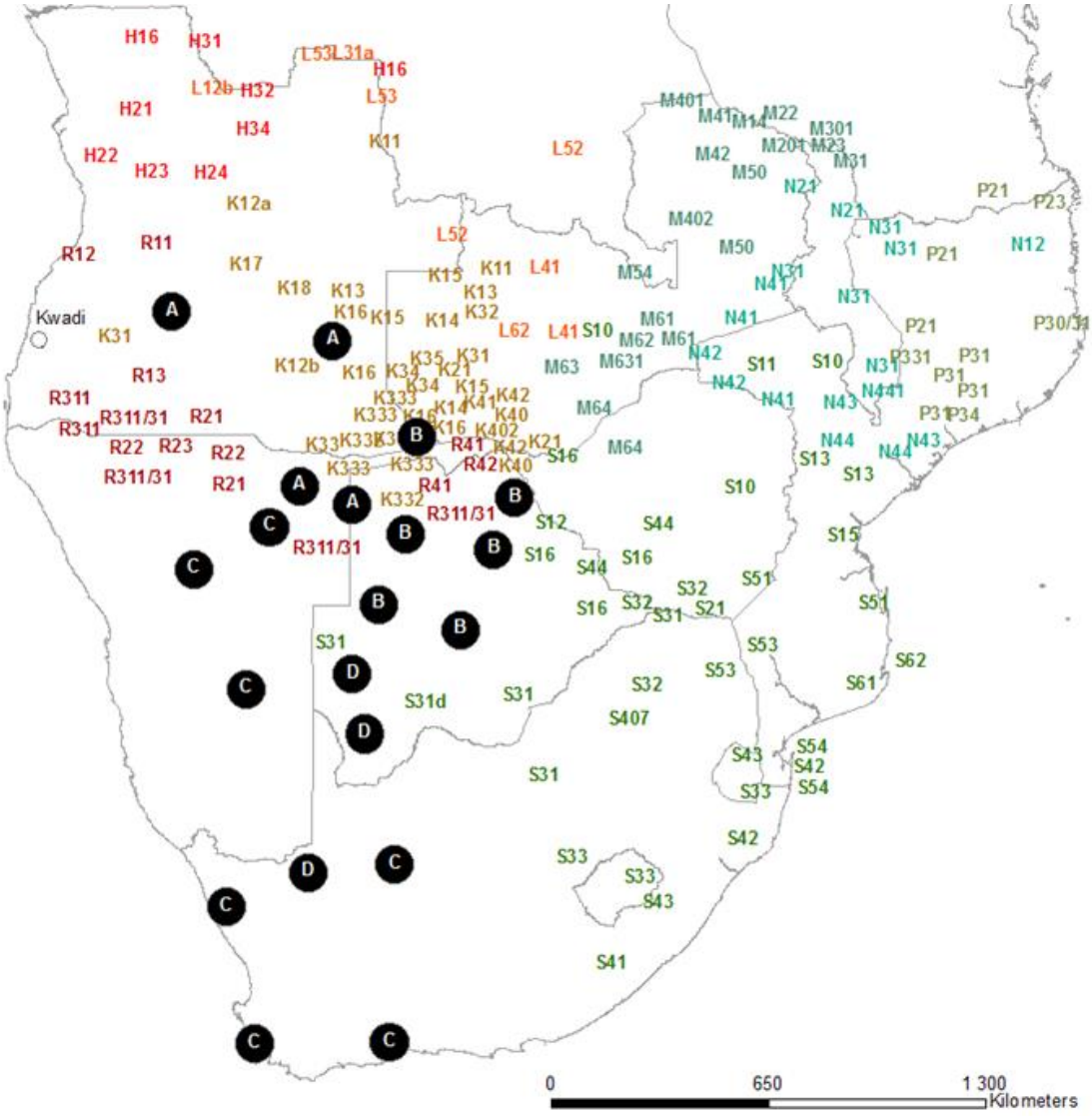

Figure 3.5. Point data for the distribution of Bantu-languages in southern Africa according to Guthrie's zones **S, M, R, K, N, P** and **L** and their related subgroups. Red-to-orange represent Western Bantu-languages and Green-to-blue represent Eastern Bantu-languages. A-D represent the Khoesan 'mega-language-family'. **A** = Juu (includes Ju|'hoan), **B** = Kalahari-Khoe (includes ǁGana/ǁGwi), **C** = Khoe (includes Nama, Dama, Cape Khoe) and **D** = Tuu (includesTaa and !Ui). The data plotted onto this map was captured as part of Chapter 4, in this thesis. Dataset 2, Appendix 2.

3.10.1. Bantu-language speakers

Language classifications have played a key role in the reconstruction of southern African farmer histories (Maho 2001; Eggert 2016; Bostoen 2018). The method is not without critique, as Vansina (1995: 189) writes:

> Scholars have been mesmerized by the huge extent of the present distribution of Bantu languages and could think only of a single process, an equally huge human migration, 'the Bantu expansion', to explain it. They interpreted the earlier and partial tree diagrams in this light and, using the principle of least moves, traced migration routes on the map. Tentative glottochronological dates lent verisimilitude to the whole.

Malcolm Guthrie's (1948; 1971) classification of the various Bantu-language zones and sub-groups is still widely used (Flight 1980; Vansina 1995; Maho 2001) (Fig. 3.5). One of the main premises of Guthrie's classification scheme is the idea that each sub-group genetically correlates with another and that these shared similarities can be geographically located within a broader language zone (de Maret 2013: 53). Since its initial inception Guthrie's classification has undergone a number of revisions and updates. It is proposed that in southern Africa it was the southeast Bantu-language speakers (zones S, M, N and P) who introduced agropastoralism (Fig. 3.5). The presence of south western speakers (zone R) and central western speakers (zone K) in southwestern Zambia and parts of Angola are linked to a different archaeological 'trait' package on the landscape, including the presence of agriculture without livestock-keeping, rectangular pole-and-*daga* structures and a social organization based on matrilineal descent (de Maret 1994/5, 2013) (Fig. 3.5).

3.10.2 Khoesan languages

The 'Khoesan' phyla comprises of a diverse range of languages not always mutually intelligible by the groups who speak them (Ehret 2008; Güldemann & Vossen 2000; Güldemann 2006, 2008) (Fig. 3.5). Many of these languages and

dialects are today extinct and their linguistic reconstruction relies on their documentation in a historical-comparative framework. There is an uncontested identification of three families within this phylum: Khoe, Ju and Tuu (Güldemann 2008; Ehret 2008). Khoe is the largest of these groups, it has a wide geographic distribution and has the highest number of speakers today. The language however is highly diverse. Two branches are correlate to Khoe: Khoekhoe (including Nama, Damara and the historical Cape Khoe) and Kalahari Khoe (including Khwe, Naro, ||Gana/|Gwi, Shua and Tswa) (Fig. 3.5). Güldemann (2008) suggests a connection between Khoe-Kwadi speakers and the click-languages spoken in East Africa, although this is debated. For example, Heine and König (2008: 242):

> If we argue that there was a spread, a caveat must be kept in mind. It is at least theoretically possible that the territory of the Proto-Khoe speaking community extended all the way from northern Botswana to the Cape, rather than having been confined to the area [*East Africa*, own emphasis].

To use the term Khoesan, however, is to some degree problematic even though it is widely accepted and used. du Plessis (2019:3) states that, "It should be noted, though, that when the term [Khoisan, own emphasis] is used in this way, it does not carry any automatic implication of a relationship between the different language families." Rather, Khoe and San have been historically used to identify two socially and economically different groups, they thus fall partly under colonial construction (Barnard 1992). The term Khoe often used to describe people with abundant herds of livestock, such as those groups witnessed at the Cape of Good Hope by early 17th century European mariners; and the San, used to describe groups existing off of the wild resources of the land, do not correlate meaningfully with linguistically determined groups of languages (Barnard 1992). These distinctions are important because it reminds us that language does not always positively correlate with a particular subsistence group (c.f. Heine & König 2008: 240).

The relatedness of the three families- Khoe, Ju and Tuu - remains relatively unclear with little consensus on their potential connectedness in the past. As Heine and

König (2008: 244) note a particular caveat to methods involved in linguistic reconstruction:

> Cultural vocabulary can easily spread from one language to another and there is reason to suspect that such a spread has occurred on a massive scale among Khoisan languages

3.11 Limitations with the use of linguistics in the debates

I select two main limitations that have been raised by others.

i. Imprecise methods for reconstructing the timing of linguistic divergence

As with issues associated with the calibration of human genomics in tracing points of genetic admixture and divergence (Section 3.7), lexicostatistic models used to calculate relative dates for linguistic divergences are not precise (Blench 2006). The calibration of linguistic time-scales often therefore relies on the archaeological dating methods.

ii. Historical linguistic classifications are consistently revised and debated

Language classifications are consistently undergoing revision as new research and methods emerge (Maho 2001; Blench 2006; Heine & König 2008). As with the archaeological record and its interpretation, linguists debate these methods and the exact classifications used (Maho 2001). This makes it challenging to keep up with revisions as a non-specialist.

I now return to the archaeological evidence. The next three chapters are the result of my spatio-temporal analyses of the five southern African databases.

Chapter 4: The archaeological evidence for the appearance of pastoralism and farming in southern Africa

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Supporting information is provided in Appendix 3

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RESEARCH ARTICLE

The archaeological evidence for the appearance of pastoralism and farming in southern Africa

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Abstract

This paper is a response to the growing reference to archaeological evidence by linguists and geneticists interested in the spread of early farmers and pastoralists in southern Africa. It presents two databases. The first contains the archaeological evidence for pastoralism and farming in southern Africa, for the period 550 BC to AD 1050. This is the first time that the seven different types of archaeological evidence that have traditionally been used to identify both spread events are presented together at this scale. This was stimulated by our interest in investigating the antiquity of an early 'Iron Age package' relative to the spread of single archaeological traits. The analysis shows that the package appears approximately 700 years after sites containing pottery, cattle and sheep, without agriculture, appear in the drier parts of the sub-continent. It post-dates the appearance of earlier sites with pottery associated with farmers, metal-working and cultivation in the eastern half of the sub-continent. While poor preservation undoubtedly explains the absence of some parts of the package, the analysis suggests that other explanations should be considered. The second database is a quantitative, spatial study of archaeological publications on southern African farming and pastoralism for the period 1950 to 2016, covering the same geographical area and archaeological timeframe. This is presented as a proxy for research-intensive areas in attempt to show the gaps in archaeological fieldwork and knowledge.

Introduction

Archaeologists have long grappled with the identification of past movements of people through the examination of their material culture. Consensus has not been reached on how, why and with whom livestock first spread in southern Africa, but recent genetic analyses, in particular, have freed archaeologists to once again talk of demic diffusion as an explanation for change, particularly for the spread of livestock without agriculture. Genetic evidence for the relatedness of present day Bantu-language speaking Africans across the sub-continent, and the persistence in Namibian Khoesan descendants of the gene that enables adults to digest milk

Competing interests: The authors have declared that no competing interests exist.

Table 1. Databases that present archaeological traits that are related to early southern African farming and pastoralism and that contain either a spatial or temporal dimension.

Material	Coverage	References
LSA fauna	South Africa	[5]
	South Africa, Lesotho, Namibia, Kenya and Tanzania	[6]
	Namibia, Lesotho, South Africa and Botswana	[7]
Farmer and LSA pottery	Southern Africa from Latitude 10˚S	[8, 9]
LSA fauna and Farmer fauna	Southern Africa	[10]
Farmer sites	Eastern and Southern Africa	[11]
Farmer pottery	Zimbabwe, Botswana and South Africa	[12]
	Sub-Saharan Africa	[13, 14]
LSA pottery and fauna, farmer pottery and fauna	KwaZulu-Natal province, South Africa	[15]
LSA stone tools	Southern Africa from latitude 10˚S	[16]

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proteins, has allowed geneticists to see migrations [1, 2, 3] and to suggest their origins and antiquity. Yet this does not remove the longstanding problem that archaeologists face: that it is difficult to tell cultural from demic diffusion. Archaeologists need to pause, rather than scrambling to see migration in their data. This recalls a similar reaction by archaeologists to linguistic analysis in past decades [4].

There is an increasing reference to archaeological evidence by researchers outside the discipline, but this evidence has not been brought together by archaeologists. Previous research has considered the spatio-temporal spread of single traits (Table 1), this is the first time that seven different archaeological traits are presented together at this scale. This paper attempts a comprehensive summary of the material remains of pastoralists and farmers in southern Africa for the period 550 BC to AD 1050. We present a detailed spatio-temporal review of the types of archaeological evidence that have been used by archaeologists who study the movement of the first southern African farmers and pastoralists. A second dataset provides an overview of those areas where the most research has been carried out in southern Africa, in order to identify the lacunae in archaeological field survey and published research. The second dataset shows how patchy the evidence is. Any conclusions must be tentative.

We were concerned about how to label people in the database and maps. Traditionally southern Africanist archaeologists have labelled sites by the subsistence type of their occupants–farmer, herder, hunter-herder, for example. Conventionally, livestock bones and pottery found within a Later Stone Age context (i.e. without iron tools) in the western half of southern Africa are understood to be the remnants of herders (who may or may not be related to autochthonous hunter-gatherers and who spoke languages related to the Khoe language group), whilst pottery (and later, iron tools, livestock and cereals) found on the eastern side of southern Africa is interpreted as having an agro-pastoralist origin, and is linked to the movement of Bantu-language speakers. We have retained these conventional labels for ease of comparison with other work, while recognizing that they may be problematic [6]. The detailed description of the archaeological finds at each site in the database allows the reader to interrogate their strength and to understand which proxies are commonly used for farming and pastoralism in the discipline. Whilst the database and maps refer to 'herders' and 'farmers', our naming of the database, outlined below, is in recognition of the difficulty of moving from archaeological evidence to subsistence type and group identity.

In summary, the objectives are:

i. To present a spatio-temporal review of multiple archaeological traits that are taken as evidence for farming and pastoralism in southern Africa.

ii. To investigate the antiquity of an early 'Iron Age Package' relative to the spread of single archaeological traits.

iii. To look for patterns that might be missed at a smaller scale of analysis.

iv. To present an overview of the coverage and quality of the archaeological data.

v. To investigate whether archaeological classifications have been over-influenced by the modern distribution of linguistic groups.

Materials

Two geo-referenced databases and a southern African language distribution map are presented. The first database (Database 1) is named the 'Southern African Database for the appearance of Livestock, Pottery, Metal and Crops' (S1 Table). The naming reflects our reluctance to definitively identify the occupants of a site as farmers or pastoralists–although, most commonly, farmer sites are identified by archaeologists on the presence of a minimum of pottery type and geographical position, and pastoralist sites by the minimum evidence of livestock and geographical position.

There are multiple ways of being a *pastoralist* and here we use it very broadly to describe livestock-keepers without agriculture. It thus encompasses all the various terms (hunter-herders, hunters-with-stock, stone-tool-using herders) that have been used to describe livestock-keepers by southern Africanist archaeologists. We use the term *hunter-gatherer* to describe LSA sites where no livestock are found.

The southern African database for the appearance of livestock, pottery, metal and crops (Database 1)

This is the first database to provide a chronological, geo-referenced list of the material that is commonly used by archaeologists to identify the presence of early farmers and pastoralists in southern Africa. The database contains geo-referenced and radiocarbon-dated archaeological evidence for farmers and pastoralists from 209 sites dating to between 550 BC to AD 1050 in southern Africa. Southern Africa includes all countries which lie to the south of Congo, the Democratic Republic of Congo and Tanzania. The cut-off of 1050 AD is chosen to exclude the Later Iron Age and the increasing socio-political complexity that occurs thereafter. Farmers are traditionally identified in the archaeology when the remains of domestic livestock, crops, iron tools, iron working, diagnostic pottery, daga walls and floors, grain bins, pits and livestock byre floors or enclosures are found. Together these constitute what has been called the 'Iron Age Package' or the 'Chifumbaze complex' [17]. This archaeology is conventionally understood to be that of Bantu-language speaking farmers.

Pastoralists are identified by the remains of livestock, pottery type and the geographical location of the site. Sites containing evidence of livestock and/or pottery without agriculture might contain other items of material culture such as stone and bone tools, and/or ostrich eggshell and marine shell beads but we have chosen not to include these in the database. Instead we have focused on recording those items that are common to both farmer and pastoralist sites. For example, grindstones, metals, pits and stone features, when they occur at pastoralist sites, are listed in the database. Traditionally, pastoralists are understood to be non-Bantu-language speakers and ancestral to the Khoe.

Table 2. A summary of the number and type of dates for LSA and farmer sites in Database 1.

Type of site	Number of sites	Number of conventional dates	Number of direct dates
LSA	93	176	20 (livestock bone)
			8 (fibre from pottery)
			1 (charcoal from pottery
Farmer	113	257	5 (carbon from pottery)
			1 OSL (pottery)
			2 (charcoal from pottery)
Metal-workers	3	2	3 (charcoal from pottery)
Total	**209**	**435**	**40**

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We collected all available archaeological data relating to farming and pastoralism, by southern African country. All except two sites fell below latitude 10 degrees south. The two outliers, at 8 degrees south, are Benfica in northern Angola and Kalambo Falls in northern Zambia. Benfica, on the coast of northern Angola, stands out as a potentially important site because Huffman [12, 18] has identified pottery from a shell midden at Benfica as a possible origin for the Kalundu tradition of pottery, linking it to a potential westerly route for the spread of farming. The 209 sites listed in the database have a total of 475 radiocarbon dates of which 40 are direct dates (Table 2).

The southern African farmer and pastoralist publication database (Database 2)

Database 2 presents a spatio-quantitative study of the numbers of publications on farmer and pastoralist archaeology for the period 1950 to 2016 for the research area (S2 Table).

Southern African language map

This map presents the distribution of extant southern African languages. It excludes European languages and Afrikaans. Whilst the Bantu language distribution is based on the modern distribution of these languages, the distribution of Khoe languages is based on their precolonial distribution (after [19]).

Method

All maps were created using ArcGIS version 10.5. The base map for Database 1 was compiled using the freely available USGS (US Geological Survey) Africa Digital Elevation Map.

Compilation of the southern African database for the appearance of livestock, pottery, metal and crops (Database 1)

The database was compiled from a combination of site reports, academic publications, radiocarbon laboratory lists and existing databases in print. It expands on previous spatio-temporal databases that focused on single traits in southern Africa (Table 1). The principle source journals for radiocarbon data and geographic coordinates are *Radiocarbon* and the *Journal of African History*. Other journals publish site specific reports which contain the detail required to understand what a radiocarbon date is associated with. A full list of journals and reports consulted whilst compiling the database are provided in S1 Text. The database contains these fields:

1. A unique site identifier and its location by country.

2. The official site name, the type of site and the subsistence base of its occupants as designated by archaeologists.
3. Uncalibrated radiocarbon date and laboratory number. Direct dates are noted in bold alongside the material dated.
4. Calibrated date ranges. Dates were calibrated using OxCal 4.2 and the southern hemisphere calibration curve ShCal 13. Calibrations are to 1 sigma and reported as calibrated years BC/AD.
5. Average date ranges are given in cases where there is overlap in the calibrated date ranges of multiple dates at a site and/or where a researcher recognizes a single occupation phase which has multiple dates.
6. The radiocarbon dates are given the following rating:
    1. Good. A direct date.
    2. Fair. Sequence of dates with relatively good stratigraphic control/excavator is highly confident of the association between dates and materials.
    3. Poor. Single radiocarbon dates or poor stratigraphic control and/or poor correlation between radiocarbon date and associated material and/or excavator notes that the date is unreliable.
7. A number of archaeological sites were excluded from the database (S3 Table). The criteria for exclusion from Database 1 are as follows:
    i. Insufficient detail was provided about an archaeological trait and its context.
    ii. Reports were not accessible.
    iii. The radiocarbon date is considered an outlier (i.e. very old or very young).

The sites are grouped temporally into eight 200 year time slices: 1: 551–351 BC; 2: 350–150 BC; 3: 149 BC-AD 51; 4: AD 52–252; 5: AD 253–453; 6: AD 454–654; 7: AD 655–855; 8: AD 856–1056. We are cognizant of the fact that the way in which data are grouped can manipulate patterns. However the information in Database 1 allows the reader to see the finer chronology for the appearance of archaeological traits within each time slice and their overlap. The use of a tight time range is to try to ensure that things that are plotted on the same map are contemporaneous, although the calibration distributions on radiocarbon dates constrain how refined these slices can be.

To show the spatio-temporal co-occurrence of archaeological traits at a site, a coding system is used. It represents the 12 combinations of types of archaeological evidence that may be present at archaeological sites across southern Africa. These are simplified for easy visualization; for a detailed description of each of the archaeological traits at a particular site see S1 Table. Code i and ii are only found in combination with one of the codes 1–10. The codes are:

Code 1: Site with pottery.

Code 2: Site with livestock.

Code 3: Site with pottery and livestock.

Code 4: Site with pottery, livestock and metal artefacts.

Code 5: Site with pottery and metal artefacts.

Code 6: Site with pottery and metal-working.

Code 7: Site with pottery, metal-working and cultivation.

Code 8: Site with pottery, metal-working, cultivation and livestock.

Code 9: Site with pottery, metal-working and livestock.

Code 10: Site with pottery and cultivation.

Code i: Site with structures (including pits).

Code ii: Site with livestock byres.

The following criteria were used to compile the codes:

- Presence of cultivation: carbonized seeds, seed impressed pottery and/or raised granary structures. Grindstones were not taken as a proxy for cereal cultivation but their presence is noted in the database.
- Presence of livestock: faunal remains and livestock byres.
- Presence of metal use: metal artefacts.
- Presence of metal-working: slag, tuyere and other fragments; bloom, ore, and furnace remains.
- Presence of structures: daga, floors, post-holes and pits.
- Presence of byre: phytolith analysis of soil and dung layers.

For farmer sites, in particular, there is frequently inadequate information on the association between radiocarbon dates and the archaeological finds. This means that it is difficult to determine exactly when a particular item was first introduced at a site. For example a site may be described as having a date range that covers 4th to 8th centuries AD but we have no way of knowing where in this 400 year period a particular find (e.g. a cattle tooth) fits.

Livestock are reported as Minimum Number of Individuals (MNI) represented by (M) in Database 1. When MNI is not available the number of individual specimens (NISP) is given, represented by (N) in Database 1. In cases where livestock are reported without a breakdown with stratigraphy, only the total livestock at the site can be presented.

Compilation of the southern African farmer and pastoralist publication database (Database 2)

The following online publication databases were accessed (1) Ebsco Host (Academic Search Complete and Africa-Wide Information); (2) ProQuest; (3) Taylor and Francis and (4) Jstor. We searched by country name, the term 'archaeology' and one of the following additional search terms: Iron Age, Later Stone Age (LSA), farming communities (early and late), pottery, livestock, herder, hunter-gatherer and hunter-herder.

All language categories were searched with the majority being in English; less frequently were, in order, Portuguese, German and French. Rock art research was omitted from the study as our focus was on survey and excavation for occupation sites. Once the results were reviewed, references were identified and included that were missed by the search (listed as 'Personal documentation' in Table 3). The initial search, which was hugely inflated, was whittled down to 1451 publications (Table 3). These 1451 publications were then examined for their geographic focus and to confirm their relevance for this study. When a single publication referred to multiple archaeological sites then this publication was counted against the tally of total number of

Table 3. Total publications for each southern African country as accessed through online academic databases (accessed between 21 July 2017 and 21 August 2017).

Country	Ebsco Host Academic Search Premier	ProQuest	Taylor & Francis	Jstor	Personal documentation	Total
South Africa	402	62	9	248	1	722
Swaziland	1	2	0	4	4	11
Lesotho	8	3	1	6	0	18
Botswana	97	13	2	49	16	177
Zimbabwe	50	12	8	84	0	154
Namibia	116	3	0	27	0	146
Mozambique	28	2	0	3	22	55
Malawi	16	9	4	17	10	56
Zambia	38	7	13	50	0	108
Angola	15	0	0	5	2	22
Total	**763**	**109**	**37**	**487**	**55**	**1451**

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publications for each of the sites, therefore, the total publication count rose to 2033 publications (S2 Table). In cases where archaeological research was across an area, then a central set of geographic coordinates was taken for plotting purposes (S2 Table). There are a total of 609 geo-referenced 'publication' points which were used to plot the map. An example of the full electronic search strategy is included in S2 Text. The map was compiled by overlaying a graduated symbol map (to show the geographic distribution and quantity of publications for each research area) on to an Optimized Hot spot map. This is a spatial statistical method in ArcGIS to identify high and low value regions, in this case a proxy for high and low research coverage based on publication count (Fig 1).

Compilation of the southern African language map

The language map was compiled by reference to the online sources: glottolog.org, ethnologue.com and sil.org (accessed February 2018). These databases of world languages provided the modern day distribution of different language groups. Glottolog and Ethnologue provide a classification for western and eastern Bantu-language speakers. Other reference material was also consulted to validate the map–an overview of Western, West-central and Eastern Bantu languages [20], an updated version of Malcolm Guthrie's classification of the Bantu languages [21], a classification of Western Savanna Bantu languages [22], Western and Eastern Bantu language distributions in Zambia [23], and the classification and distribution of extant pre-colonial Khoesan languages [19].

Results

The maps (Figs 2–9) (S1–S8 Figs) and S1 Table are designed to be read in conjunction and they follow the same chronological order. Key events for each of the two hundred year time slices are summarized below. The conventional interpretation as to the subsistence base of groups (farmer, pastoralist, hunter-gatherer and occupants unclassified) at a site is noted in brackets after data is presented below. A summary of the chronological appearance of livestock and directly dated pottery at southern African sites is given in S3 Text.

Map 1 (551–351 BC) (Fig 2): Earliest LSA sheep and pottery

In southern Africa the earliest evidence for sheep and undecorated pottery comes from the western half of the sub-continent. Directly dated sheep bone and associated pottery are found at Leopard's Cave in Namibia (pastoralist) [24]. This is followed by the earliest evidence of

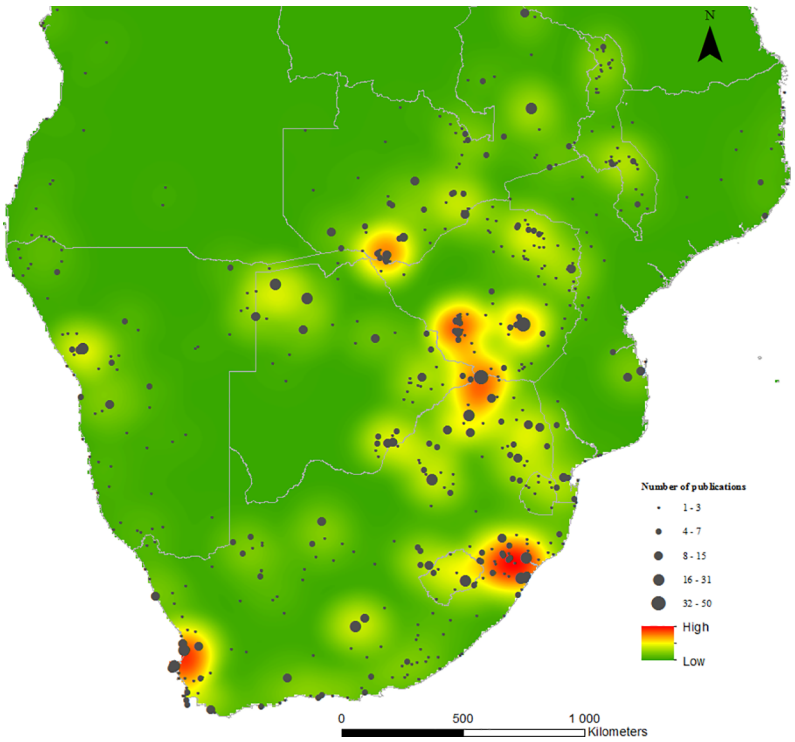

Fig 1. Quantitative spatial distribution of publications relating to LSA and farming research for the period 1950 to 2016.

https://doi.org/10.1371/journal.pone.0198941.g001

decorated pottery from direct dates on pottery at two sites in southern Mozambique (farmer) [25].

Map 2 (350–150 BC) (Fig 3): Pottery in multiple contexts

Further directly dated decorated pottery is found in the same area in Mozambique (farmer) [25]. Bambata Cave in Zimbabwe has evidence for caprines, decorated Bambata pottery, two spouts and a copper bead, although the dating is poor (pastoralist or hunter-gatherer) [26]. The earliest pottery from a South African context is found at Boundary Cave in the southern Cape with a direct date obtained from fibre temper in the pottery (hunter-gatherer) [9]. Soon after thin-walled, grit-tempered pottery is found in LSA contexts in KwaZulu-Natal and the Eastern Cape (hunter-gatherer or pastoralist) [15, 27]. The earliest sheep from a South African context are found at the LSA site of Spoegrivier Cave and are directly dated to this period (pastoralist) [28]. In Zambia, there is the first evidence of a farmer presence on the basis of decorated pottery, however, its association with radiocarbon dating is poor [29]. The last site occupied in this time period is Messum in Namibia which has evidence of pottery, pits and iron loops–the association between artifacts and dates are poor (occupants unclassified) [30, 31].

Map 3 (149 BC- AD 51) (Fig 4): Farmer sites within a restricted area

This period sees the appearance of more LSA sites with pottery and sheep in Namibia (pastoralist or hunter-gatherer). The earliest evidence of cattle in southern Africa is directly dated to an LSA site in Botswana, where they are found in association with sheep (pastoralist or hunter-gatherer) [32]. Decorated pottery with lugs, caprines and pits are found together at /Ai

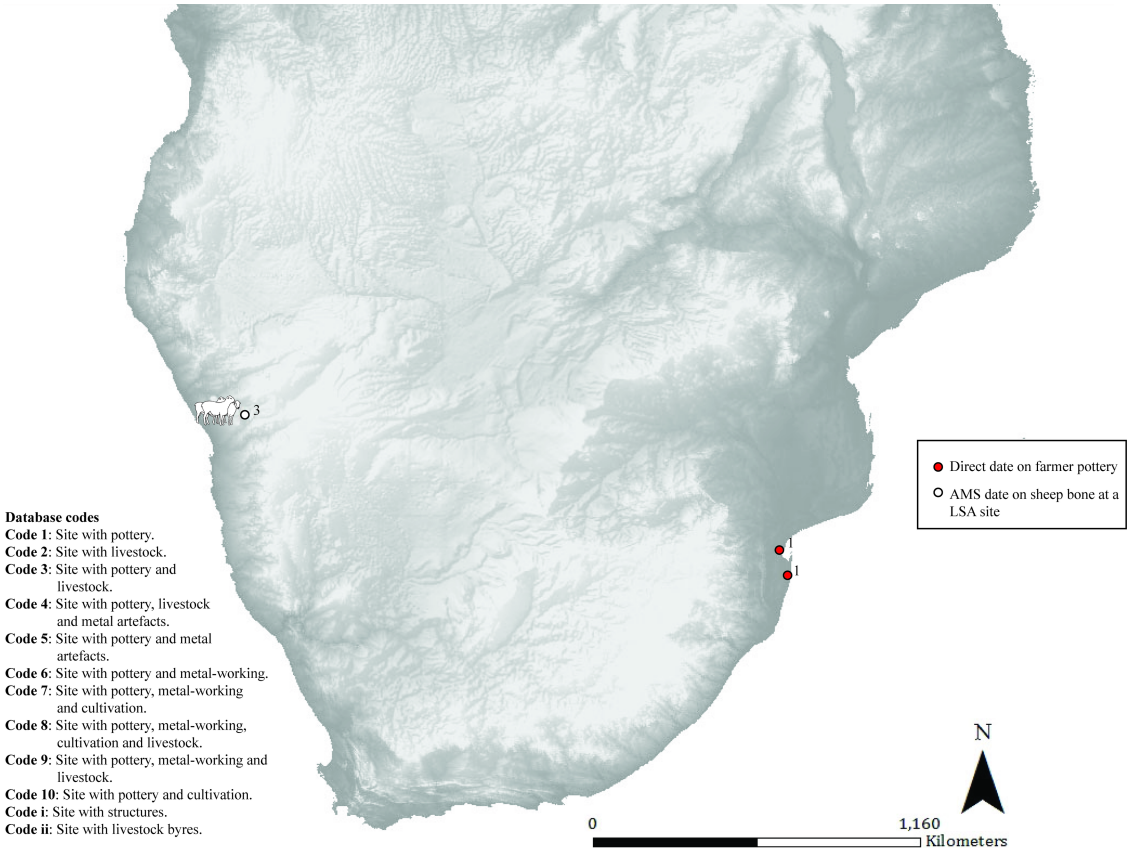

Fig 2. Map 1. Archaeological evidence for pastoralism and farming for the period 551–351 BC.

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Tomas in South Africa (pastoralist) [28]. Pottery is found at further sites within a variety of LSA contexts that cannot be confidently linked to any particular subsistence strategy/group. Sites with sheep (directly dated) and pottery on the southern Cape coast appear for the first time (pastoralist). Farmer sites, identified by their decorated pottery proxy, are found within a restricted area.

Map 4 (AD 52–252) (Fig 5) First evidence of crops in a farmer context

Sheep and pottery are found in further LSA context sites, along the western and southern coast of southern Africa (pastoralist or hunter-gatherer). Pottery is found in a variety of contexts. For the first time evidence of metal-working, metals and daga remains are found alongside pottery at farmer sites. This period has the first evidence of crops at a farmer site dating to mid-3rd century AD—impressions of bulrush millet in pottery at the site of Silver Leaves, South Africa [33]. Farmer sites appear north of the Zambezi. Direct evidence of livestock is yet to be found at a site associated with farming in southern Africa.

Map 5 (AD 253–453) (Fig 6): Earliest evidence of cattle in farmer context

There is the first evidence of cattle, a single tooth, in a farmer context north of the Zambezi (Malawi). It dates to the end of 4th century AD, however, the dating is poor [34]. During this period LSA sites with livestock (15 sites) outnumber farmer sites with livestock (3 sites). Decorated pottery and iron-working are found at sites along the southern African East coast from

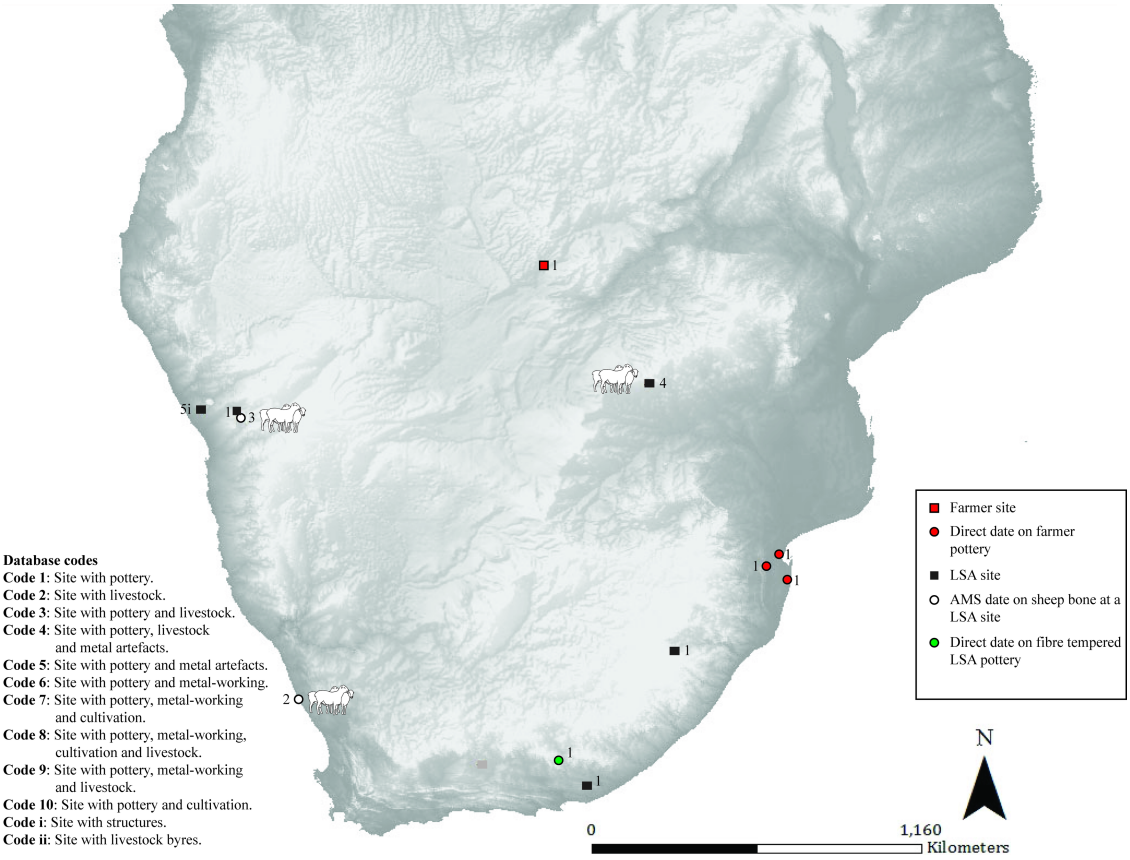

Fig 3. Map 2. Archaeological evidence for pastoralism and farming for the period 350–150 BC.

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southern Mozambique to KwaZulu-Natal, South Africa, with no evidence for cattle or crops at these coastal sites (farmer). Caprines and cattle from two sites in South Africa date to the 5th century AD, this is their earliest occurrence at farmer sites in South Africa. Further sites appear with metal-working, metal artefacts and pottery in Namibia (occupants unclassified) [35]. Sheep and some cattle are found across the drier parts of southern Africa, sometimes associated with pottery (pastoralist or hunter-gatherer). There is the first appearance of sheep in an LSA context in the interior of South Africa (end of 3rd century AD), although the dating is poor [36]. Cattle, identified through ancient DNA analysis of a horn core, and directly dated, first appear in an LSA context in South Africa (pastoralist), dating to the end of the 5th century AD [37].

Map 6 (AD 454–654) (Fig 7): LSA livestock at a peak. First appearance of the Iron Age package at three sites

As well as cattle and caprines appearing at many farmer sites (21 sites with livestock, 17 of which have cattle) for the first time, proxy evidence for cattle byres also appears for the first time. Cattle byres are only found at sites from the Limpopo basin southwards. Caprines and pottery predominate at LSA sites in the drier western half of the sub-continent, although cattle do occur (17 sites with livestock, 3 of which have cattle). In Zimbabwe, a possibly circular hut floor is recorded, if this is correct it is the earliest example of this type of feature [38]. This is the first time that rectangular hut floors are recognized in southern Zambia [39]. Whilst only

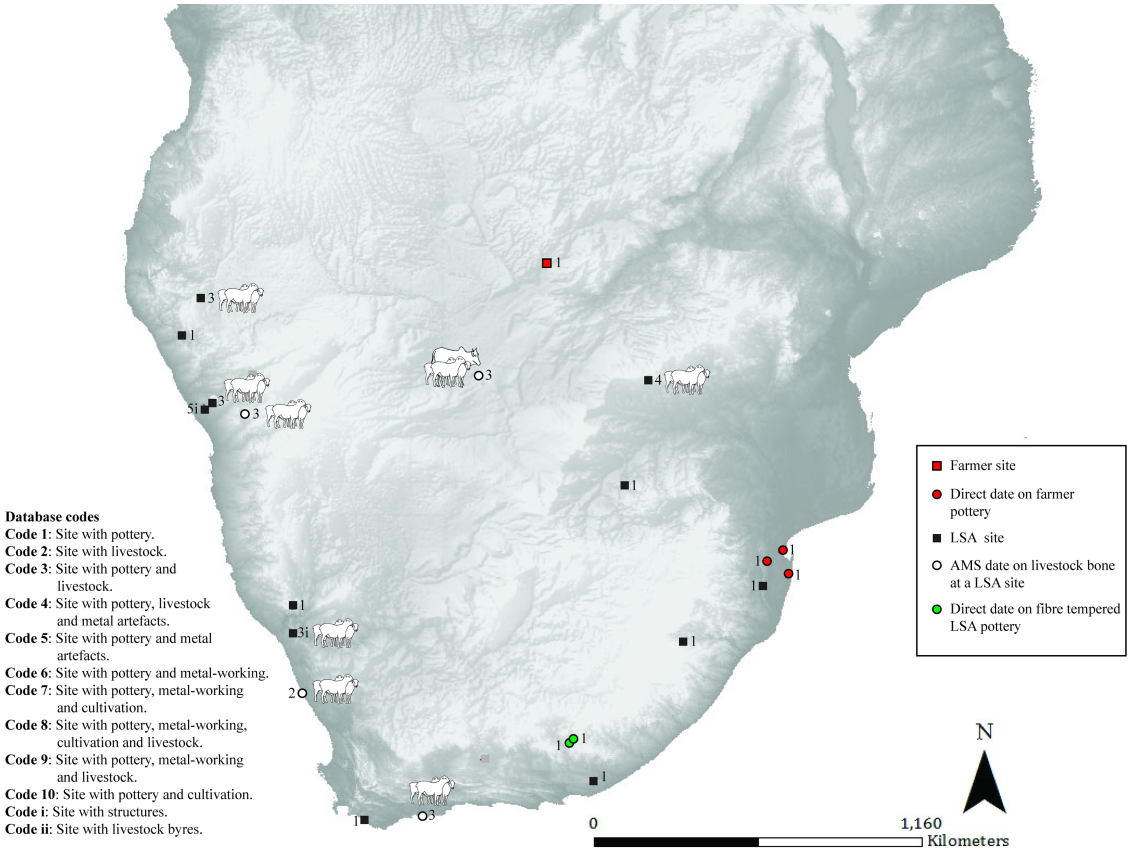

Fig 4. Map 3. Archaeological evidence for pastoralism and farming for the period 149 BC–AD 51.

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three sites have the complete Iron Age package (code 8), there are 19 sites containing an almost complete package (code 7 or 9), making this time slice the first in which the Iron Age package is common (total 22 sites).

Map 7 (AD 655–855) (Fig 8): Farming reaches most southerly known point

The Iron Age package is found at many sites in the eastern half of southern Africa during this period. Cattle numbers increase, with many farmer sites having evidence for pottery, metal-working, cultivation and livestock. Caprines and pottery have a continued presence in the drier western half of southern Africa. The spread of farming reaches its most southerly point near the Fish River, South Africa. This is the first time that farmer sites with livestock significantly outnumber LSA sites with livestock (18 LSA to 32 farmer). Farmer sites containing cattle are at a peak.

Map 8 (AD 856–1056) (Fig 9)

The ratio of farmer sites with livestock to LSA sites with livestock remains almost constant from the proceeding period (16 LSA to 32 farmer). This period sees the continued dominance of cattle, caprines and the Iron Age Package at farmer sites throughout eastern southern Africa and the continued presence of pottery and caprines in LSA contexts in the western half of southern Africa.

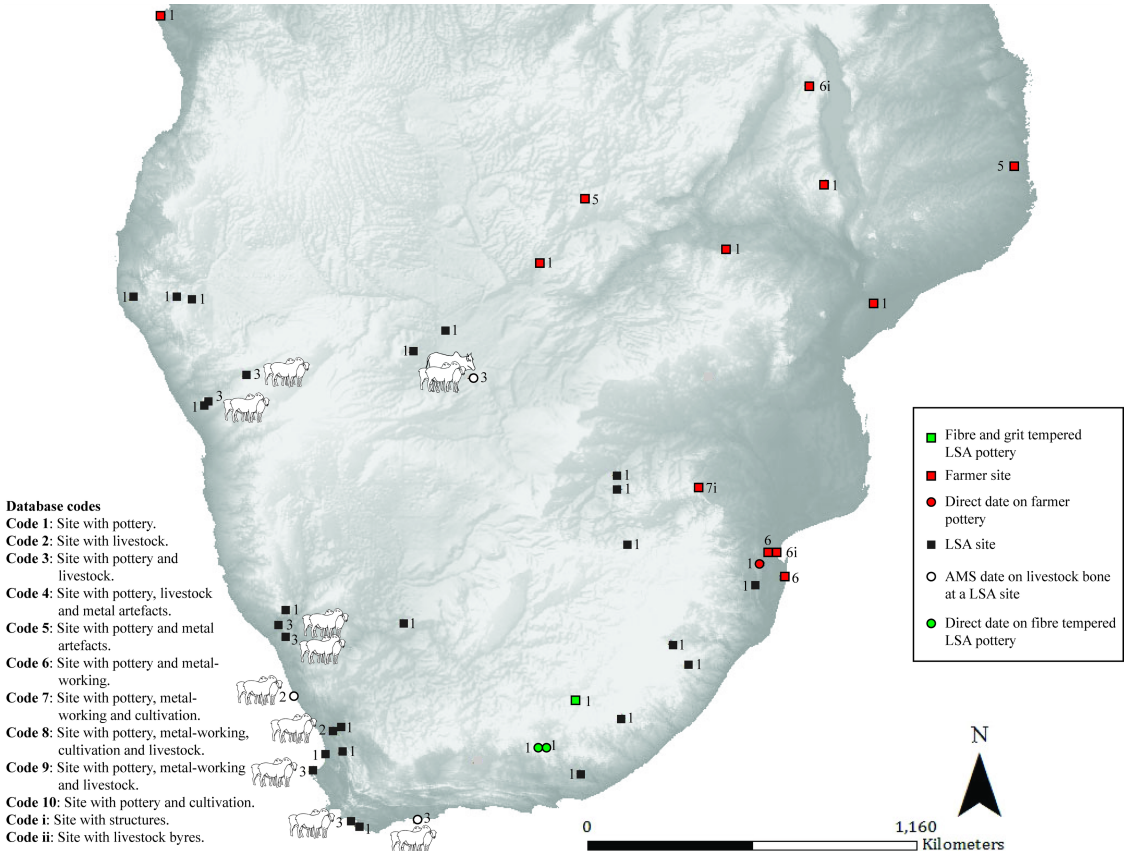

Fig 5. Map 4. Archaeological evidence for pastoralism and farming for the period AD 52–252.

https://doi.org/10.1371/journal.pone.0198941.g005

Discussion

This paper is a response to evidence of increasing interest from other disciplines in the spread of farming and pastoralism in southern Africa, as evidenced in cross-disciplinary papers [40, 41, 42]. We first comment on the two spread events themselves, before raising some points that speak to potential gaps and weaknesses in archaeological research and method.

The spread events

The main contribution of our analysis is to suggest five patterns in the archaeology of this period. New archaeological finds may well change such patterns. Our data highlights the gaps in our evidence.

1. Contrary to prevailing assumptions, our data shows a strong and enduring pastoralist presence in the western half of the subcontinent. Most papers on the spread of pastoralism to South Africa recount the sightings of large herds of cattle by early European mariners visiting the southern shores of Africa and then discuss the absence for evidence for them in the archaeological record. Mapping at this scale reveals that which has been overlooked by archaeologists–the enduring pastoralist presence in the western half of southern Africa, ahead of and during the period of farmer expansion. This pattern is revealed because we chose to group all the various categories of LSA people who are found with domestic animals as pastoralists, rather than following previous research that focused on categorizing

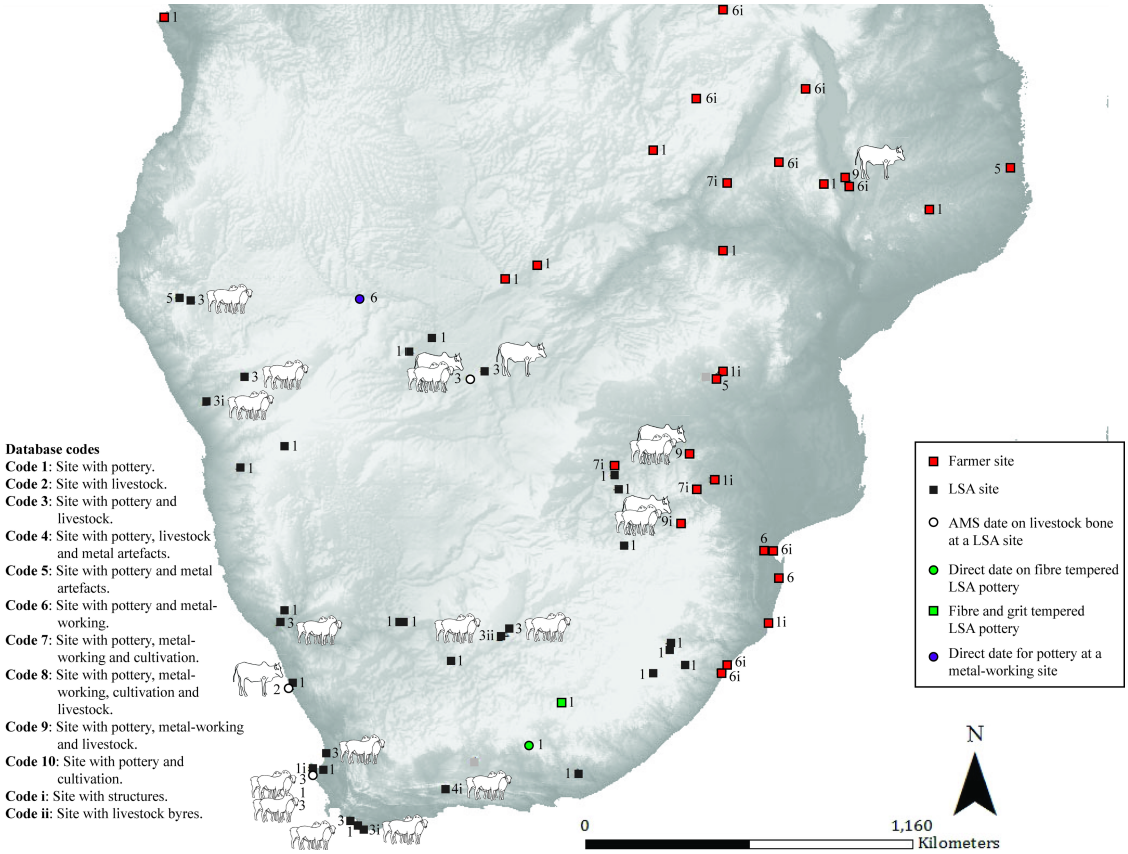

Fig 6. Map 5. Archaeological evidence for pastoralism and farming for the period AD 253–453.

https://doi.org/10.1371/journal.pone.0198941.g006

people with livestock to distinguish hunter-gatherer-herders from immigrant herders (for a discussion see [6]).

2. Different types of early pottery, which have been attributed to pastoralists, farmers and hunter-gatherers, appear at the same time at widely dispersed points across southern Africa (cf. [8]).

3. Crops predated livestock in farmer contexts. Livestock are absent at the earliest farmer sites on the eastern side of southern Africa. This absence of evidence has most commonly been attributed to poor preservation and the ritual disposal of bone [43], but with the greater body of archaeological data this argument is becoming less tenable—livestock remains of greater antiquity are preserved at many southern African pastoralist sites and from AD 600 onwards at many farmer sites. The current evidence favours a scenario that sees the arrival of farmers without livestock ahead of agro-pastoralists (see [44]).

4. There is an explosion of livestock, particularly cattle, at farmer sites, from the mid-7th century AD onwards, contemporaneous with the appearance of the Iron Age package at many sites across eastern southern Africa (cf. [45, 46])

5. Pastoralism arrived in southern Africa ahead of farming: livestock-keeping spread rapidly from present day Namibia across a wide area southwards and eastwards (cf. [37]).

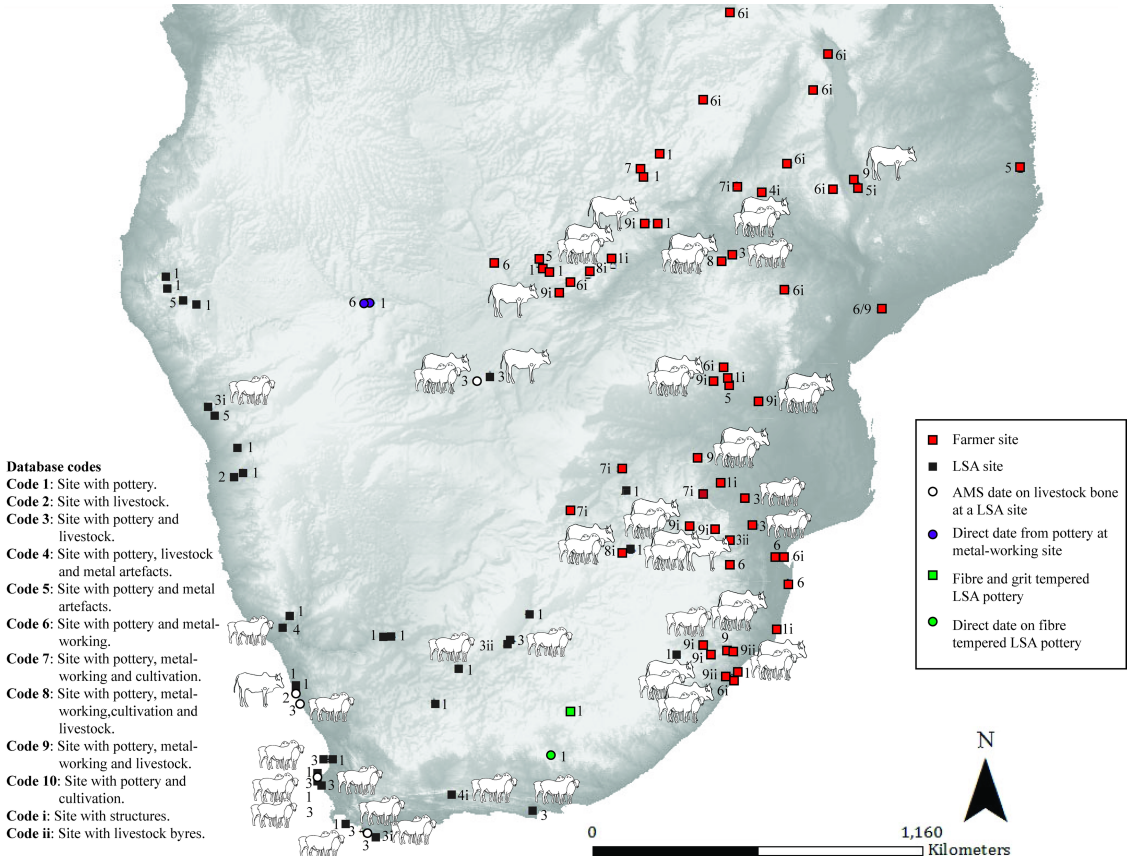

Fig 7. Map 6. Archaeological evidence for pastoralism and farming for the period AD 454–654.

https://doi.org/10.1371/journal.pone.0198941.g007

The robustness of the archaeological evidence: Potential biases

Arthur [47] draws attention to the inherent bias in South African pastoralist research towards long occupation rock shelters. These are most commonly discovered and excavated at the neglect of open air sites. Furthermore open air sites are more likely to represent a single occupation period and thus have a more fleeting presence on the landscape. In the database the bias is clear, 67 of the 93 LSA sites are rock shelters or coastal boulder sites (of which there are only five), while 10 are coastal shell middens and 15 are inland open air sites. This bias in survey and excavation affects the mapping exercise by presenting an artificially static, and coastal, distribution, of what we assume would have been more widely distributed and mobile pastoralist groups. It is likely that as more open air sites are found and dated, the picture will become more fluid and filled.

We have made the assumption in presenting this work that the identification of cattle and caprines is valid. Recent debates about the strength of genetic identification versus morphological identification suggest we need to be cautious and that there is need for increased analysis of the ancient DNA of animal bones [48–53]. Similarly, the finds needs to be directly dated. Whilst there is an awareness of the importance of direct dating among those working on pastoralism this is not the case in early farmer research. There is not a single direct date on livestock from a farmer context in southern Africa. Research at pastoralist sites has demonstrated that livestock bones may be younger than their deposit, which has led to a concerted effort to directly date bones at pastoralist sites [54, 55]. The need for direct dating of livestock on farming sites is

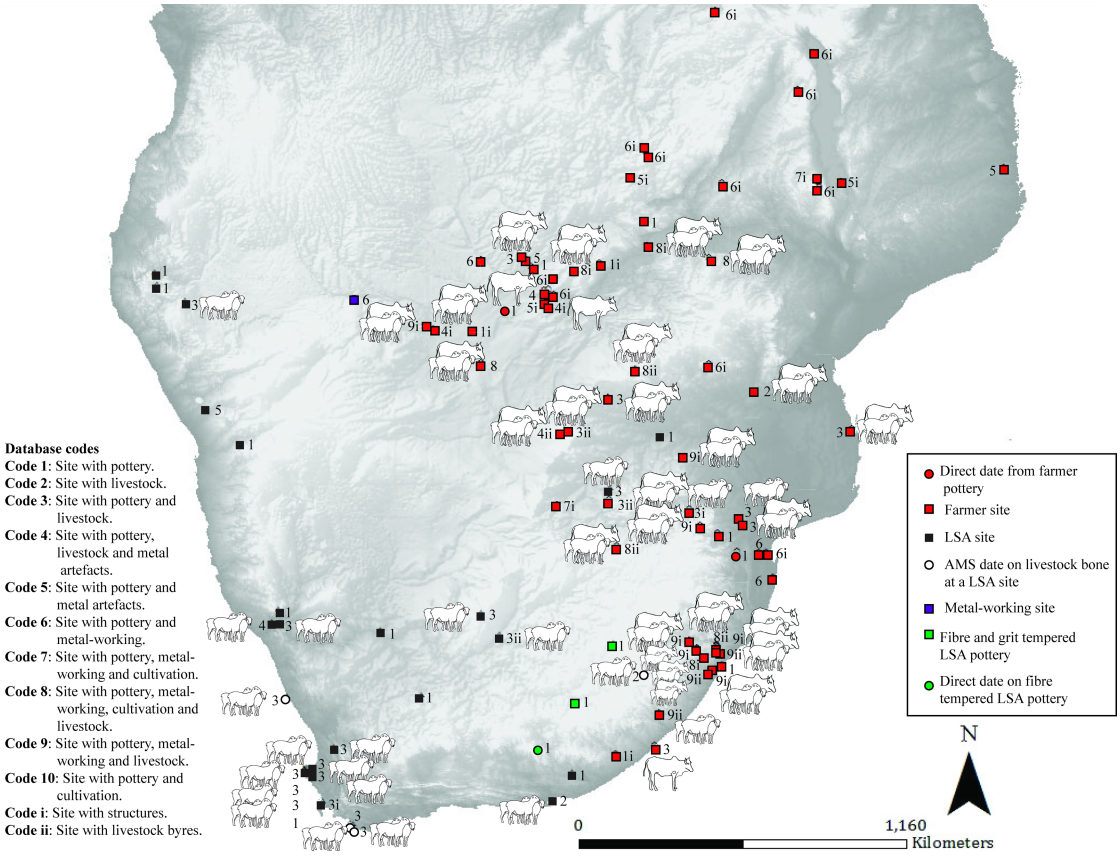

Fig 8. Map 7. Archaeological evidence for pastoralism and farming for the period AD 655–855.

https://doi.org/10.1371/journal.pone.0198941.g008

pressing, particularly given the dominance of an interpretative model, the Central Cattle Pattern, which relies on the early presence of cattle at farmer sites ([43, 56], see also [57]).

The dating of pottery is also problematic. It is still overwhelmingly dated by association with stratigraphic layer at LSA sites, even at those sites where bones within the same stratigraphic layer have shown to be younger (i.e. [54]).

We compiled the Southern African Language map because of a concern that there was inherent bias on the part of researchers to interpret the subsistence base of a site's occupants based on a site's geographical position. To explore this we have plotted all of the archaeological sites onto the language map (Fig 10). We wanted to see if there were any outliers–namely an archaeological classification that did not follow modern day language patterning. There is only one. The site of Gundu (GUN) is not classified as Eastern Bantu but falls within the modern day distribution of Eastern Bantu languages. Similarly, with the exception of a handful of sites, pastoralist LSA sites are found outside of the eastern Bantu language area. Further investigation is needed—were pastoralists absent from areas where eastern Bantu-languages dominate today? This seems unlikely. These areas would have been attractive to pastoralists given their watering and grazing potential.

In 2004, Smith and Ouzman raised the hypothesis that a body of southern African geometric rock art had a pastoralist authorship [58, 59]. In Fig 11, its distribution is shown overlaid on to the language map. As the figure shows this type of pastoralist archaeology falls within the modern day distribution of eastern Bantu-language speakers and is illustrative of what might be missing from our archaeological knowledge.

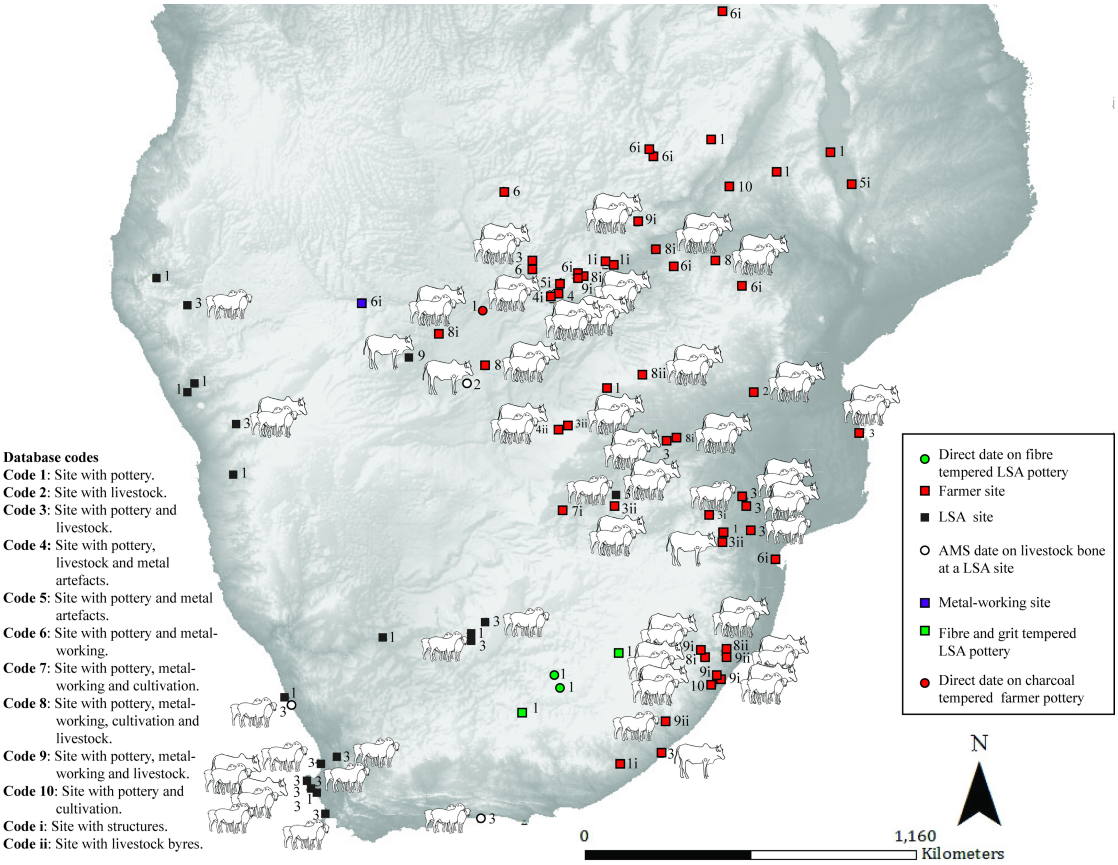

Fig 9. Map 8. Archaeological evidence for pastoralism and farming for the period AD 856–1056.

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When we mapped the number of publications on pastoralist and farmer research for the period 1950 to 2016, the bias in our data towards research-rich areas is clear. More research is needed in Angola, Mozambique, large parts of Botswana and South Africa's interior. Angola is a potentially important route for the spread of pastoralists, farmers and livestock [12, 17] and yet there is hardly any archaeology from this region. The picture and patterns presented in this short paper are sure to change as these gaps are filled.

Conclusion

This paper is a response to a growing interest in the spread of farming and pastoralism in southern Africa by other disciplines, particularly geneticists, by providing a detailed spatio-temporal overview of the archaeological evidence that is used to interpret the past spread of these groups. Sadr [8] has stressed that more might be learnt about past population movements and interactions in southern Africa by dissolving the conceptual boundary between the southern African Iron Age and Stone Age periods because they overlap in time. The patterns presented in the paper prove the strength of this argument at this scale of analysis.

Our key findings are (1) evidence for an enduring pastoralist presence in southern Africa ahead of, and during, the appearance of agro-pastoralists; (2) the early, contemporaneous and widespread appearance of pottery that has conventionally been assigned to different subsistence groups (hunter-gatherer, farmer and pastoralist), and (3), the appearance of crop farming ahead of agro-pastoralism at farmer sites. These findings are tentative. Patterns may

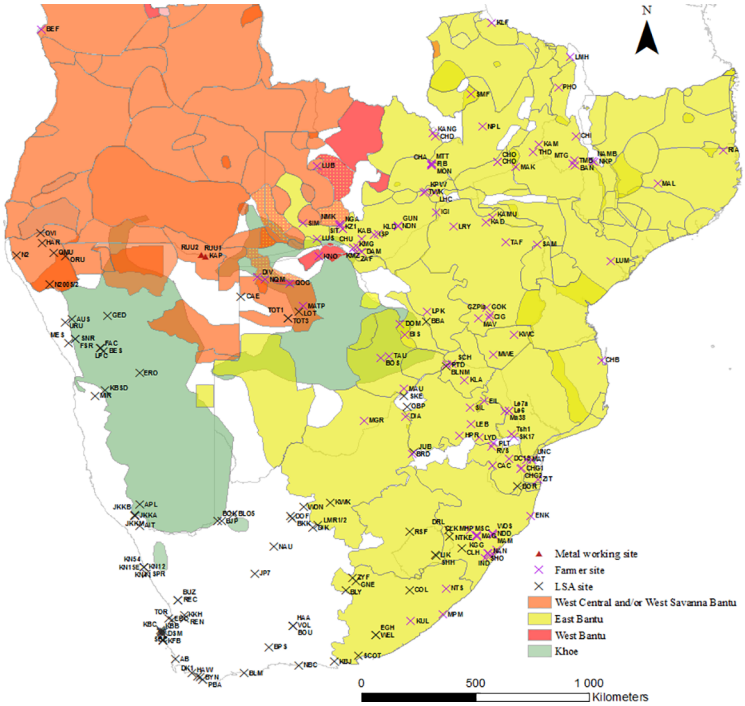

Fig 10. The distribution of archaeological sites in Database 1 overlaid onto the distribution map of African languages–note the almost perfect match between modern language distribution and archaeological classification.

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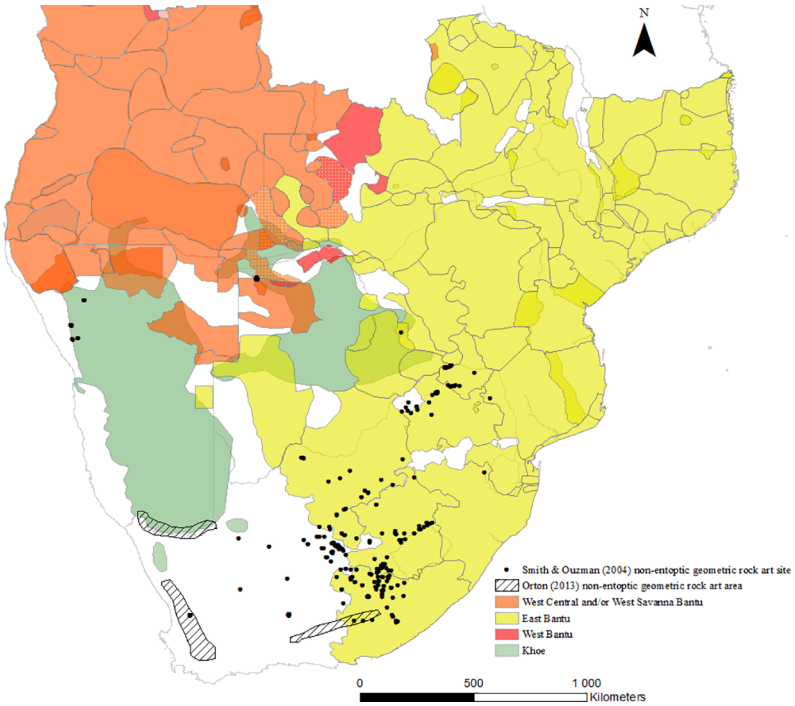

Fig 11. Map to show the distribution of geometric rock art (pastoralist) [58, 59, 60] compared to the distribution of African languages as an illustration of areas which might potentially contain archaeological evidence that has not yet been captured.

https://doi.org/10.1371/journal.pone.0198941.g011

change as more data becomes available. In particular we draw attention to the bias towards rock shelter excavation in Later Stone Age Archaeology and to the complete absence of direct dates on livestock within farming research.

Supporting information

S1 Fig. Archaeological evidence for pastoralism and farming for the period 551–351 BC.
(TIF)

S2 Fig. Archaeological evidence for pastoralism and farming for the period 350–150 BC.
(TIF)

S3 Fig. Archaeological evidence for pastoralism and farming for the period 149 BC–AD 51.
(TIF)

S4 Fig. Archaeological evidence for pastoralism and farming for the period AD 52–252.
(TIF)

S5 Fig. Archaeological evidence for pastoralism and farming for the period AD 253–453.
(TIF)

S6 Fig. Archaeological evidence for pastoralism and farming for the period AD 454–654.
(TIF)

S7 Fig. Archaeological evidence for pastoralism and farming for the period AD 655–855.
(TIF)

S8 Fig. Archaeological evidence for pastoralism and farming for the period AD 856–1056.
(TIF)

S1 Table. The archaeological evidence for the appearance of livestock, pottery, metal and crops in southern Africa (Database 1).
(DOCX)

S2 Table. Southern African publication count for research on farming and pastoralism for the period 1950 to 2016 (Database 2).
(XLSX)

S3 Table. List of archaeological sites that were excluded from Database 1.
(DOCX)

S1 Text. The full list of journals and reports consulted to compile Database 1.
(DOCX)

S2 Text. An example of the full electronic search strategy used to capture data for Database 2.
(DOCX)

S3 Text. A chronological summary for the appearance of livestock and directly dated pottery at southern African sites for the period 550 BC to AD 1056.
(DOCX)

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Formal analysis: Faye Lander, Thembi Russell.

Investigation: Faye Lander, Thembi Russell.

Methodology: Faye Lander, Thembi Russell.

Visualization: Faye Lander, Thembi Russell.

Writing – original draft: Faye Lander, Thembi Russell.

Writing – review & editing: Faye Lander, Thembi Russell.

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Chapter 5: Fat-tailed sheep and thin-walled pots: contextualising rock art and pre-agriculturist pottery within the last 3000 years in KwaZulu-Natal, South Africa

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Fat-tailed sheep and thin-walled pots: contextualising rock art and pre-agriculturist pottery within the last 3000 years in KwaZulu-Natal, South Africa

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ABSTRACT

Rock art is underutilised in the debate surrounding the indigenous adoption or rejection of domestic livestock during the last 2000 years in southern Africa. We redress this by exploring the antiquity and possible meaning of paintings of sheep in the northern uKhahlamba-Drakensberg. Diachronic changes in the archaeological record of the Thukela Basin over the last 3000 years are mapped. The distribution of early, thin-walled, non-fibre-tempered pottery and a relative chronology of rock art are used to build an argument that sheep paintings are old. We draw on the later patterning in agriculturist and forager material culture to explore the meaning of the older distributions. We suggest that the paintings predate the arrival of agriculturists to this region and that they are paintings of pastoralist-owned sheep. This conclusion has significance for the larger debate surrounding the arrival of the first livestock into southern Africa around 2000 years ago.

KEY WORDS: Fat-tailed sheep, rock art, pottery, northern Drakensberg, human-animal relationships, pastoralists, foragers, agriculturists.

PLACING PAINTED LIVESTOCK INTO THE HUNTER-TO-HERDER DEBATE IN SOUTHERN AFRICA

This research seeks to understand the timing, authorship and symbolism of livestock-connected rock art in southern Africa. It stems from an interest in the debate over the introduction of non-agricultural food production in this region about 2000 years ago (the 'hunter-to-herder debate'). The long-running debate surrounding the introduction and keeping of sheep and cattle into the drier, western half of southern Africa has revolved around whether they were adopted and exchanged amongst indigenous foragers or herded by migrant pastoralists or a combination of the two (e.g. Sadr 2008, 2013a, b; Smith 2008, 2014; Orton 2015). Much of this debate is built on interpretations of the archaeological evidence that are based on the contrast between foragers and food producers, and the consequent expectation that the archaeological evidence of the two will be very different. We recently challenged this assumption and raised the possibility that migrant pastoralists might have been missed because they did not fit the 'true' pastoralist definition (Russell & Lander 2015a), which is frequently modelled on Khoe pastoralists as encountered by Europeans along southern African shores from the 15th century onwards (Ross 2012). We instead suggested that it might be useful to consider the similarities between groups with different subsistence bases. Here we extend this argument to include human-animal relationships as reflected in the rock art, with particular reference to sheep.

Within the debate, livestock paintings have been overlooked, or have become the subject of fleeting speculation (Smith 2000: 233; Sadr 2013a: 178), because they remain for the most part undated. This poses a challenge to their incorporation into wider archaeological interpretations. Sadr (2004) proposes that foragers adopted, herded and exchanged sheep as prestige items. However, "paintings of livestock are rare and

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do not suggest great symbolic importance" (Sadr 2013a: 178). Similarly, Smith (2000: 233) considers that fine-line cattle paintings in the Brandberg, Namibia, are ritually unimportant: had they been, "they would have been more graphically represented in the art". Whilst we disagree with the underlying assumption in both their speculations, that quantity equates to significance, they nevertheless raise the interesting question of why livestock were painted by foragers. To attempt to answer this we need to understand the timing and context of their painting.

We were drawn by Mazel's (1984a, 1992a, 2013) suggestion that there may have been an alternative and earlier source of sheep than those brought by sedentary, iron-producing, Bantu-speaking agriculturists, who arrived in KwaZulu-Natal in the 4th century AD (Maggs 1980a; Whitelaw & Moon 1996). Mazel (1992a) raises the possibility that the thin-walled pottery that is found on some forager sites dating to around 2000 years ago is derived from pastoralists who were in or close to the uKhahlamba-Drakensberg (hereafter shortened to Drakensberg) at this time (see also Rudner 1979). His hypothesis caused us to consider whether some of the sheep paintings in this area might relate to the same event.

In this paper we tackle the timing of the painting of sheep images through the use of a regional, *relative* chronology based on (a) the manner of depiction of domestic livestock and (b) the presence or absence of time markers such as colonial imagery (Mazel 1982; Lander 2014; Russell & Lander 2015b), together with (c) the history of forager and agriculturist occupation of the landscape, as understood from excavation.

To explore the context of the livestock paintings and thin-walled pots, the spatial distributions of rock art, people and their animals in the area now known as KwaZulu-Natal are compared through time by mapping a dataset of all known forager and agriculturist sites for the time period of *circa* 3000 to 500 BP. The time frame is chosen to capture the period preceding the arrival of food producers to South Africa. The agriculturist and forager data comes from published site reports and the KwaZulu-Natal Museum database (cf. Russell & Steele 2009; Lander 2014). Sites that contain a similar type of pottery in neighbouring Lesotho have also been mapped.

We start with a summary description of the thin-walled pottery (for a full review see Mazel 1992a, 1999), before presenting the archaeological evidence from forager and/or agriculturist data in a number of chronologically ordered slices of time. This is followed by a discussion of the authorship of thin-walled pottery and a section that contextualises sheep paintings in time and space. In the discussion section we raise a number of patterns and problems encountered during the mapping exercise.

THIN-WALLED POTS IN EASTERN SOUTHERN AFRICA

The earliest thin-walled pottery found in KwaZulu-Natal dates to the turn of the first millennium BC (Mazel 1992a), thus predating the earliest pottery generally associated with agriculturists by some 400 years: the coastal site of Mzonjani (MZ) has a date span from the late 4th to the early 6th century AD (Maggs 1980a). This pottery is unlike the earliest agriculturist pottery in vessel shape, thickness and burnish (Maggs 1980a; Whitelaw pers. comm. 2015). Mazel (1984a, 1992a, b) describes it as thin-walled, fine, grit-tempered, undecorated and often bag-shaped. Within KwaZulu-Natal, its distribution is mainly restricted to the higher altitude forager shelters in Mazel's (1982:

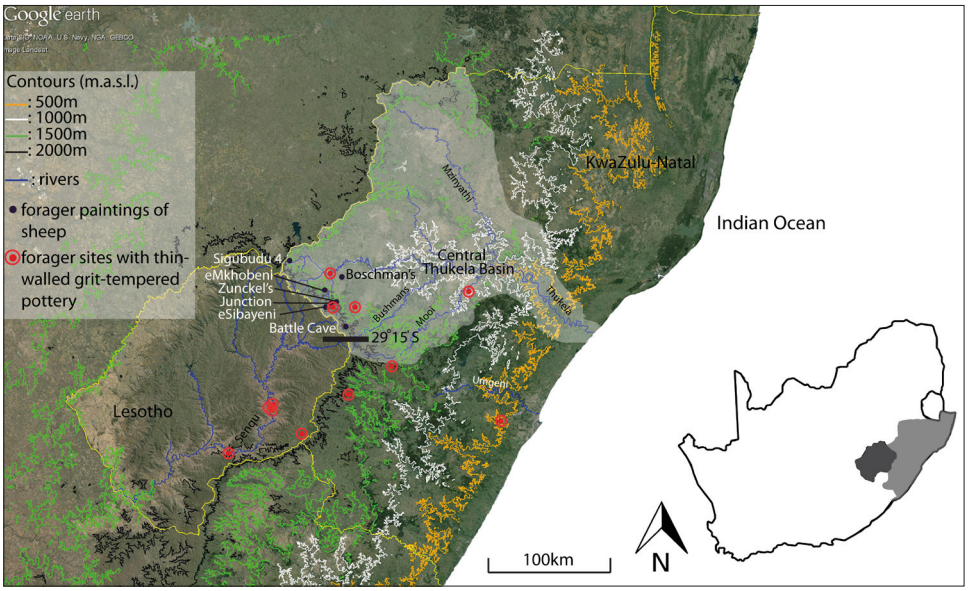

Fig. 1. All known sites containing either painted sheep or non-agriculturist pottery. The study area is focussed on KwaZulu-Natal, with some sites in Lesotho mentioned. The masked area shows the extent of the Thukela Basin. The central Thukela Basin is the area below the 1000 m contour line.

67) 'northern Drakensberg', which he defines as that part of the range from latitude S29°15' northwards, up to and including the Royal Natal National Park, indicated by the site of Sigubudu 4 (Fig. 1).

Pottery that pre-dates agriculturists and fits the description given above is found at eight sites within our study area (Table 1; all tables at end of paper): three sites in the northern Drakenberg (Clarke's Shelter (CLK), Driel Shelter (DRL), Mhlwazini Shelter (MWZ); Maggs & Ward 1980; Mazel 1984a, 1990); one site in the central Thukela River Basin (kwaThwaleyakhe Shelter (KTK); Mazel 1993); another on the southern-northern Drakensberg border (Collingham Shelter (CLH); Mazel 1992b); one site in the southern Drakensberg (Good Hope Shelter (GH); Cable et al. 1980); and two sites in the eastern Lesotho highlands (Sehonghong (SEH), Moshebi's Shelters (MOS); Carter 1977; Mitchell 1996). In the following section we consider the spatio-temporal context of this pottery alongside other archaeological evidence during the period 3000 to 500 years ago.

VISUALISING CHANGING OCCUPATION PATTERNS FROM 3000 TO 500 YEARS AGO

The spatio-temporal mapping of archaeological sites is a strategy for understanding the possible timing and source of the painted sheep and the non-agriculturist pottery and an attempt to contextualise them in space and time. To this end, the 2500 years are divided into six slices of time to reflect our understanding of the archaeology of the study area and the limitations of radiocarbon determinations. For each period the archaeological data is mapped, while tables (at end of paper) present the detail of the mapped data. Tables are organised chronologically based on the calibrated radiocarbon dates

associated with the site (all dates were calibrated using OxCal 4.2 and the calibration curve ShCal 13 and are reported to one standard deviation). Archaeological sites are carried across time slices when their calibrated date range straddles two periods—site names are asterisked in the table to show a minimal overlap with a given time period. When the association between the radiocarbon dates and the pottery is poor due to disturbed stratigraphy, this is indicated with a question mark after the site name in both the table and on the map.

We are cognisant of the fact that patterns and results change depending on the scale of analysis, and one of the dilemmas we encountered was where to draw the line around our study area. Similarly, the time slices in which data are grouped can change how they are visualised and perceived. The chronologically arranged tables that we present with each map are an attempt to mitigate this. Further, we tried to work with tight time ranges to ensure that things that are plotted on the same map are contemporaneous, but were constrained by the calibration distributions on radiocarbon dates that limit the refinement of such slices. The result is that our time slices of approximately 300 years represent approximately 12 generations of farmers and foragers and the paper should be read with this level of accuracy in mind.

Circa *3000 to 2000 years BP (1000 to 1 BC) (Fig. 2, Table 2)*

This is a period when South Africa was occupied solely by foragers. Over the course of these thousand years the Thukela Basin forager groups were increasingly numerous and sedentary (Mazel 1989: 75–6). Their sites are spread throughout the river basin (Fig. 2, Table 2). The faunal remains suggest an increasing reliance on small mammals such as dassies and hares and small to small-medium bovids; people were also fishing more (Mazel 1988, 1989).

Subsistence intensification is often closely associated to increasing sedentism, as described during this period (Mazel 1989) (see Garcea 2006: 202). This may also be reflected in rock paintings: multiple layering of a similar type may indicate the continuous use of a site through time by the same group of people (Russell 2013). This overpainting is a feature of Drakensberg rock art (Vinnicombe 1976; Russell 2000, 2012) (for an interpretation of the meaning of overpainting see, for example, Lewis-Williams 1974; Lewis-Williams & Dowson 1989). Such sedentism may have given people a sense of "attachment to a chosen space" (Garcea 2006: 204). Honey procurement and storage (Dale et al. 2004; Russell & Lander 2015b, see also Hollmann 2015a), hunting with snares (Russell & Lander 2015a) and traps and fishing equipment (Parsons 2015) are sometimes also linked to decreased mobility—for example, snares must be checked daily and stored resources guarded; it is possible that they mark changing economic strategies (Dale et al. 2004) and perhaps ownership rights over certain resources (Woodburn 1982: 432–3; Marshall & Hildebrand 2002).

During this time period, there are three dated rock paintings proving that foragers were painting in high-altitude shelters (Table 2, Fig. 2). A fine-line bichrome eland and a shaded polychrome rhebuck were painted at Main Caves North (MCN). At Highmoor (HGM) a fine-line bichrome hartebeest dates to within the same period (Mazel & Watchman 2003). Towards the end of this millennium, thin-walled pottery first appears on the landscape (Mazel 1992a, b) (Table 2).

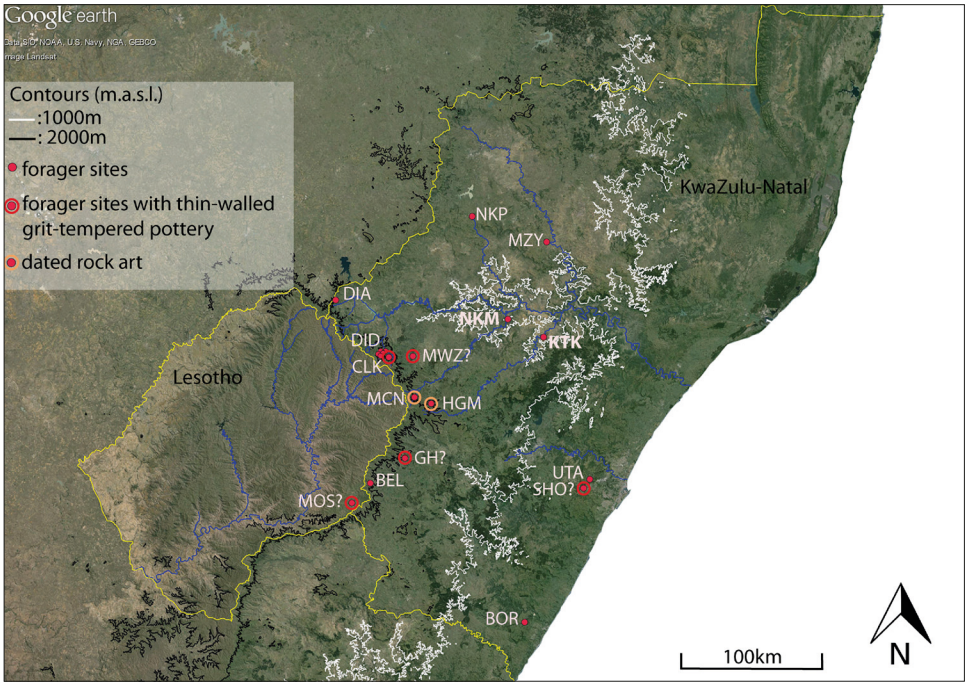

Fig. 2. 1000–1 BC. Forager sites.

Circa *2000 to 1650 years BP (AD 1 to 350) (Fig. 4, Table 3)*
The earliest bones of domestic livestock occur in southern Africa approximately 2000 years ago. These predate the arrival of agriculturists in the eastern half of South Africa and represent herding without agriculture. These early sheep bones and one early cattle bone are confined to the western and southern coastal areas of South Africa; none occur in KwaZulu-Natal (Orton et al. 2013; Russell & Lander 2015a).

In the Thukela Basin, the earliest fragments of pottery in a secure stratigraphic context are found at Collingham Shelter (CLH) and date to the 2nd to 3rd centuries AD (Mazel 1992b) (Figs 3, 4, Table 3). These fragments pre-date and are stylistically different from the earliest known agriculturist pottery in KwaZulu-Natal (i.e. *Mzonjani*, dating to the end of the 4th century AD; Maggs 1980a). They also pre-date the earliest known agriculturist pottery in the Thukela Valley (of the *Msuluzi* facies, at Wosi (WOS), dating to the 6th to 7th centuries AD) by about 400 years (Van Schalkwyk 1994a). The distributions of sites within the Thukela Basin are little changed from the previous time period.

The only dated rock art during this period, a monochrome red human figure, is found at the site of White Elephant Shelter (WES) in the Giants Castle Game Reserve (Mazel & Watchman 2003).

Circa *1650 to 1350 BP (AD 350 to 650) (Fig. 5, Table 4)*
This period coincides with the start of an occupational hiatus in the northern Drakensberg that lasts for 1000 years (Mazel 1989, 1998, 2009), and the spread of the first agriculturists into KwaZulu-Natal (Maggs 1980a; Hall 1980; Whitelaw

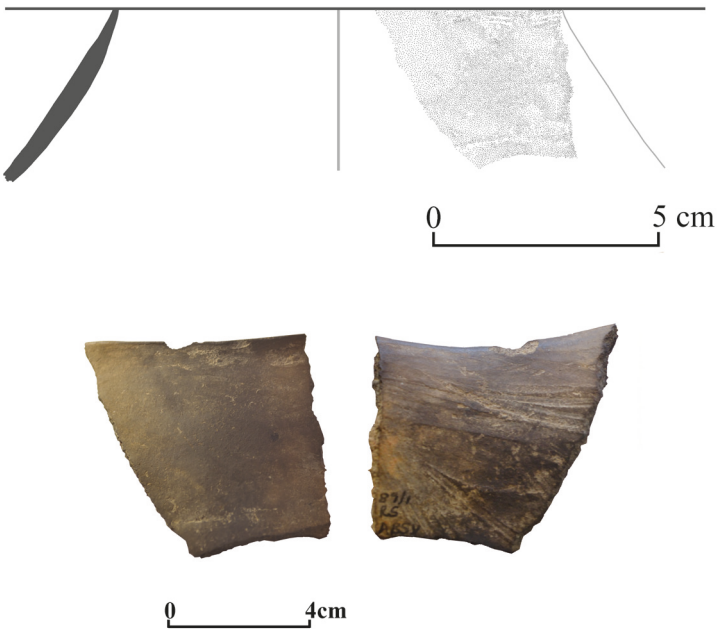

Fig. 3. A sherd of early thin-walled pottery from ABSV layer, Collingham Shelter (CLH).

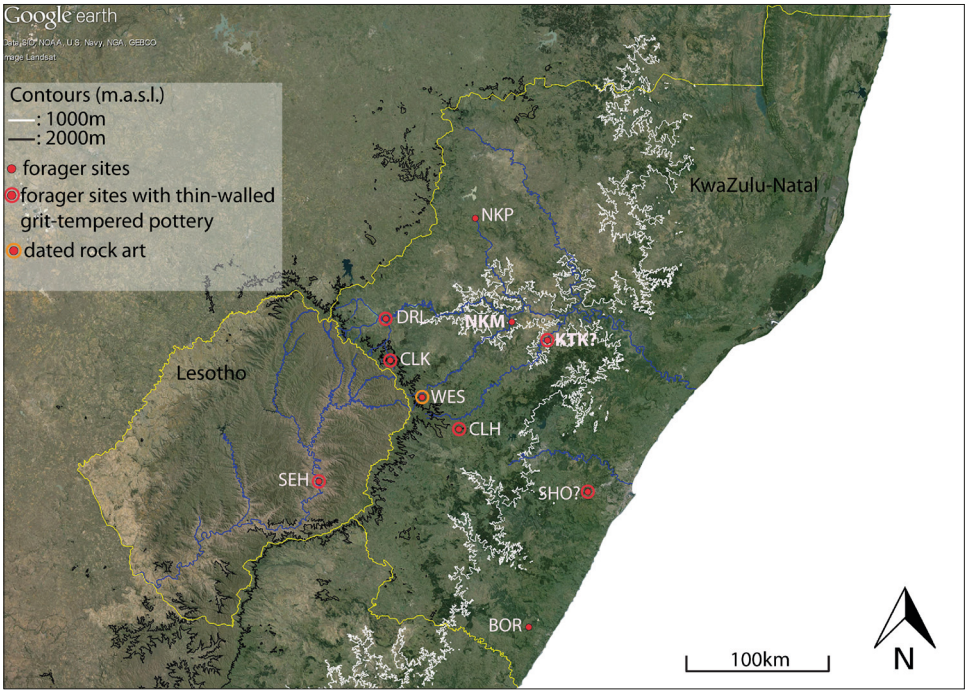

Fig. 4. AD 1–350. Forager sites and the first appearance of securely dated pottery in this area.

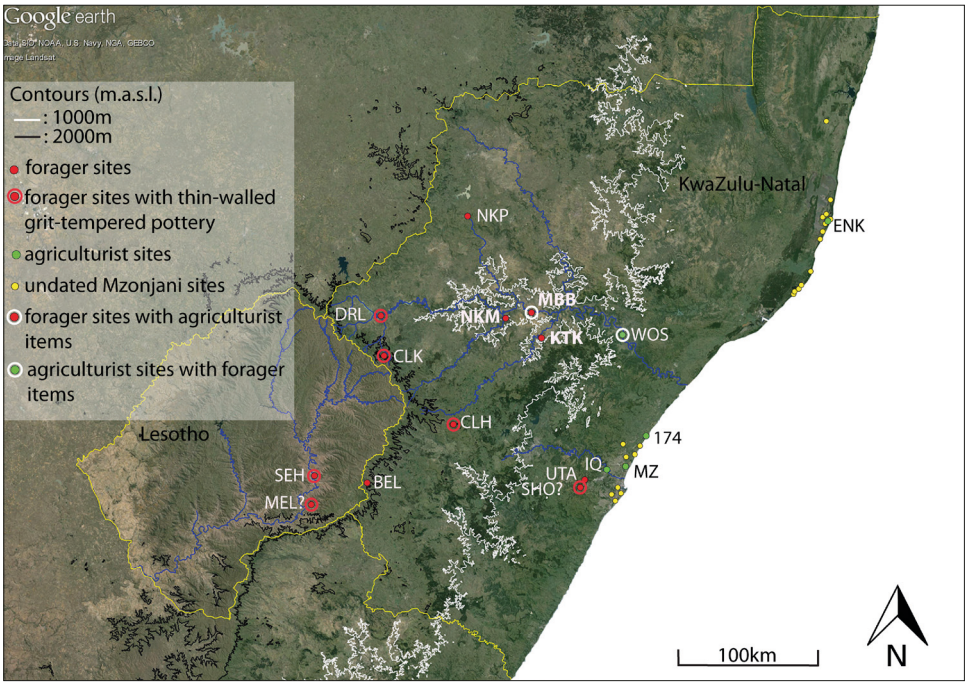

Fig. 5. AD 350–650. Agriculturists are moving into the landscape for the first time. There is an exchange of material culture between farmers and foragers.

& Moon 1996; Russell & Steele 2009) (Fig. 5, Table 4). The last site that is known to have been occupied in the northern Drakensberg is Clarke's Shelter (CLK), which was vacated by the end of the 6th century AD and not reoccupied (Mazel 1984a). Its abandonment coincides with the last-known occurrence of securely identified thin-walled pottery in the northern Drakensberg. During this time, the Thukela Basin rock shelters (excluding the northern Drakensberg) were occupied exclusively by foragers (Mazel 1998). The *central* Thukela Basin (i.e. the area below the 1000 m a.s.l. contour) continued to be occupied by foragers (iNkolimahashi (NKM) and kwaThwaleyakhe (KTK)), while the forager site of Mbabane (MBB) appeared on the landscape for the first time.

The earliest agriculturist sites in KwaZulu-Natal are found in the coastal corridor: Mzonjani (MZ) and Enkwazini (ENK) date to the 4th to 6th centuries AD (Hall 1980; Maggs 1980a). The first recorded incursion into the inland valleys is seen on Figure 5, with Wosi (WOS) situated in the lower Thukela Valley below the 500 m contour. The earliest remains of domestic animals (sheep, cattle and goat) are found at agriculturist sites such as Wosi, with dates from the end of the 6th century AD (Table 5), although it is likely that earlier remains have simply not been discovered yet. Two possible cattle tooth fragments occur at Mzonjani (MZ), for example (Maggs 1980a). No domestic livestock are found in a secure forager context for the entire timeframe of this study, although agriculturist material culture is found on forager sites and vice versa. If this is not an artefact of archaeological preservation, identification, and/or the type of pastoralism practised, then it means that items other than livestock were changing

hands. Early agriculturist pottery, with its distinctive decoration and thicker walls dominates on the landscape from this time onwards.

At some time during the 6th to 7th centuries AD, foragers at Mbabane Shelter (MBB) acquired *Msuluzi* pottery, iron and *Sorghum caffrorum* from agriculturists (Mazel 1986b) (Table 4). This is the earliest dated evidence of agriculturist material in a forager context in the eastern part of South Africa. The relevant deposits in Mbabane are slightly older than the agriculturist sites that follow, raising the possibility that the shelter was occupied ahead of the movement of agriculturists into the central Thukela Basin. The agriculturist site of Wosi (WOS) (which contains *Msuluzi* pottery) has a slightly more recent date; however, the calibrated date range and pottery found at the site suggests that it is contemporaneous to Mbabane Shelter (MBB) (Table 4). It is tempting to imagine that the material culture at each of these sites is a result of the meeting and exchanging of things between Wosi agriculturists and Mbabane foragers and that this might represent initial contact between these two different groups. Later we consider the possible reasons for these exchanges and their change through time.

Circa *1350 to 1100 years BP (AD 650 to 900) (Fig. 6, Table 6)*

There is no evidence that people were living in the northern Drakensberg at this time, Collingham Shelter (CLH) is the only dated site in the entire KwaZulu-Natal Drakensberg. It is during this period that agriculturists, with sheep, cattle and goats, first occupy the central Thukela Basin (i.e. in the bushveld, below the 1000 m contour), alongside the long-established forager sites of iNkolimahashi (NKM) and kwaThwaleyakhe (KTK). Two new forager sites (Gehle (GEL) and Sikhanyisweni (SKW)) appear outside of the

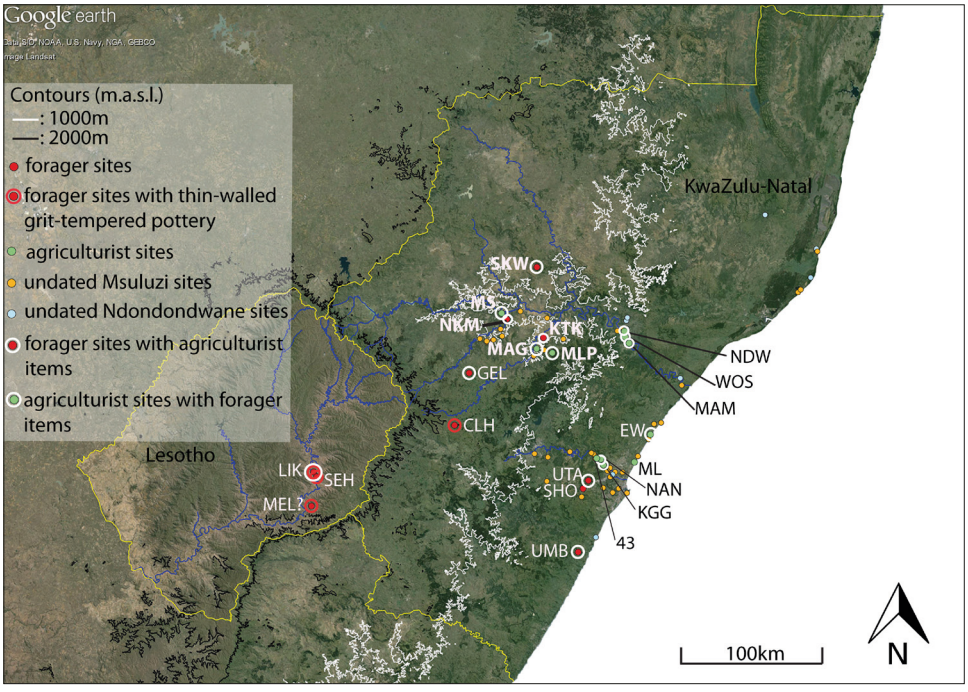

Fig. 6. AD 650–900. Forager and agriculturist sites.

central basin at an altitude of approximately 1400–1500 m. Both are approximately 50 km from the nearest dated agriculturist site and both contain agriculturist material. Indeed, most of the forager and agriculturist sites during this period show evidence of the exchange of material between them and the items exchanged are similar to those seen in the previous period.

We have plotted undated and unpublished sites that contain *Msuluzi* and the slightly later *Ndondondwane* pottery. Not only are these sites likely to have been occupied at this time, but also, their plotting gives some indication of parts of the picture that might be missing from this analysis (see the discussion section).

In Lesotho, the site of Likoaeng (LIK), in the eastern highlands, provides the second oldest example, in the study area, of agriculturist-authored pottery (*Ndondondwane*) in a forager context (Mitchell et al. 2008). Six other forager sites in the study area have agriculturist pottery of a similar antiquity to that found at Likoaeng. However, the site of Likoaeng stands out as the only forager site with domestic stock at this time—a sheep bone has been directly dated to 1285 ± 40 years b.p. (GrA-23237) (Mitchell et al. 2008: 53) (Table 5). Mitchell et al. (2008) interpret this as a site at which foragers are keeping sheep. Unfortunately, there are no forager sites with securely dated livestock remains in KwaZulu-Natal for comparison.

Circa *1100 to 800 years BP (AD 900 to 1200) (Fig. 7, Table 7)*
There are no dated forager sites in the northern Drakensberg during this period. The upper Thukela Basin, however, has occupation at one site, Driel (DRL). Paintings were being made on the northern-southern Drakensberg border—as indicated by the dated organic crust overlaying red paint at Barnes Shelter, Giants Castle (Mazel & Watchman 2003) (Fig. 7, Table 7). This is also a time of change amongst agriculturists, with the end of the Early Iron Age and the start of the Late Iron Age at around 950 years ago. This is also when livestock bones *may* first appear in forager deposits in KwaZulu-Natal. However, the link between bones and radiocarbon dates is tenuous—Mzinyashana 1 is the only site that may contain domestic stock (MNI=2) between 1520 and 970 years ago but the stratigraphy is too disturbed to be confident of their exact age. In Lesotho, Pitsaneng (PIT) has domestic livestock at this time (Table 5). There is nevertheless continued evidence of the exchange of material culture between foragers and farmers and, as in previous periods, almost all sites show evidence of exchange. Once again we have plotted the undated, unpublished sites containing *Ntshekane* pottery, as this is the time period within which this type of pottery occurs.

Circa *800 to 500 years BP (AD 1200 to 1500) (Fig. 8, Table 8)*
This marks a period in which it becomes harder to determine whether foragers or agriculturists are occupying the Thukela Basin rock shelters. Mazel (1999) suggests that there is both forager and agriculturist occupation of rock shelters at this time (e.g. iNkolimahashi (NKM) from 550 years ago shows mixed occupation). He interprets the presence of slag, iron, agriculturist ceramics and livestock, alongside an absence of forager things, as representing a very ephemeral occupation of the site of Mzinyashana (MZY) by agriculturists at *circa* 700 BP (Mazel 1997, 1998). Plug (2002), on the other hand, and basing her argument solely on the site's faunal assemblage and its peculiarities relative to other agriculturist sites, raises the possibility that these might be hunters in transition, but the evidence is inconclusive.

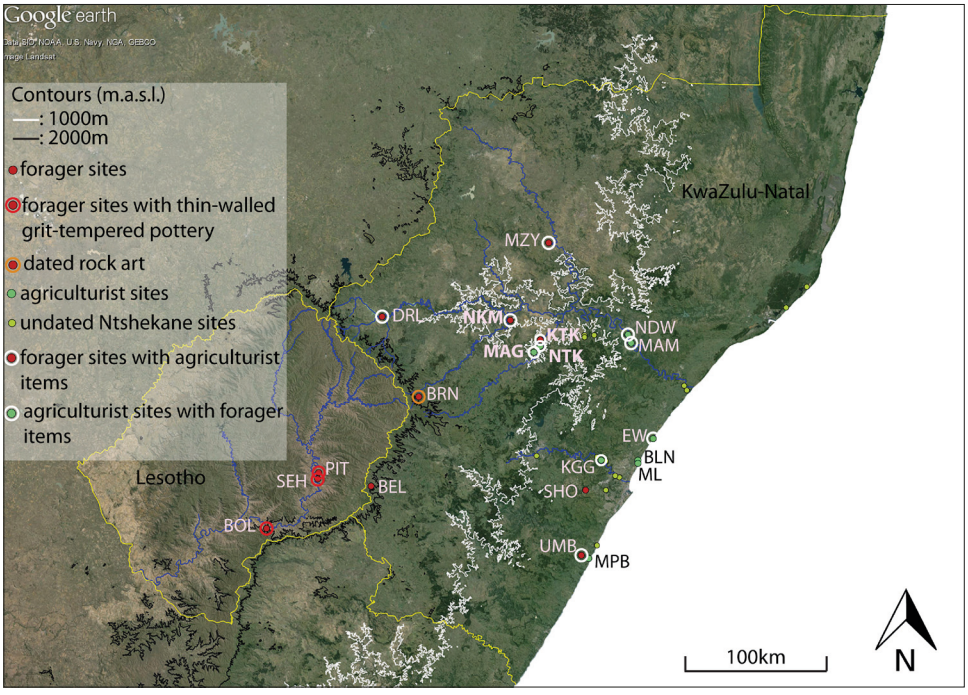

Fig. 7. AD 900–1200. Forager and agriculturist sites.

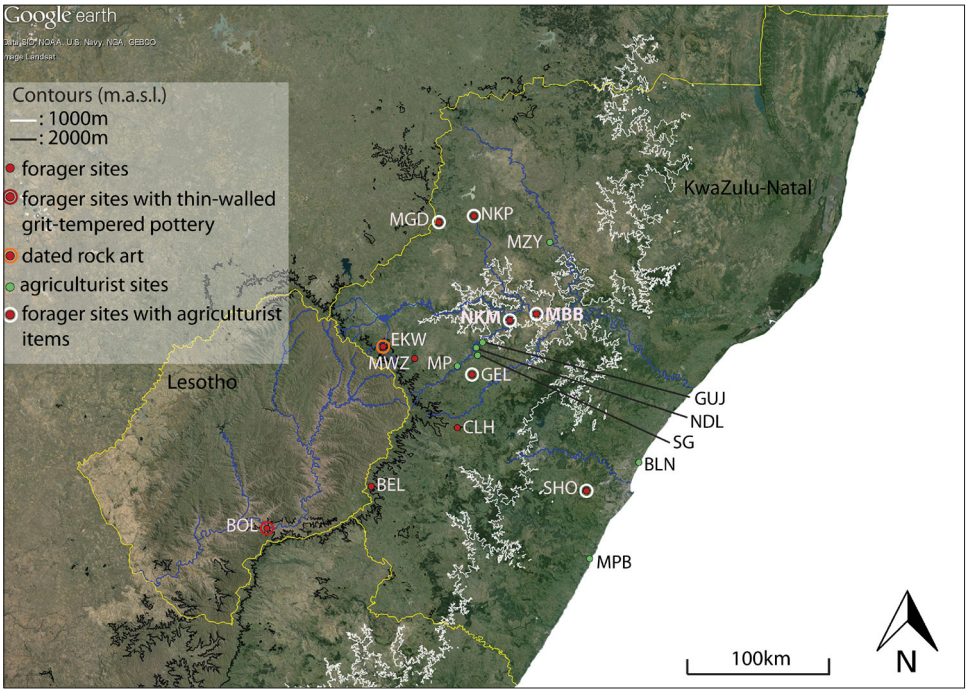

Fig. 8. AD 1200–1500. Forager and agriculturist sites.

A new pattern is seen in material-culture exchanges; forager sites contain agriculturist things (as in previous periods), but for the first time there is a complete absence of forager things at agriculturist sites—we return to this issue in the discussion.

At about 600 years ago, the higher elevation rock shelter sites of the northern Drakensberg were resettled (Mazel 1989, 1998) (Fig. 8). Mazel links this development to agriculturist settlement in the foothills of the same region (ibid.).

EARLY, GRIT-TEMPERED, THIN-WALLED POTTERY: FORAGER OR PASTORALIST?

Pre-agriculturist thin-walled pottery, both grit-tempered[1] and fibre-tempered, is well documented in southern Africa (Laidler 1929; Rudner 1979; Mazel 1992a, b; Mitchell 1996; Bollong et al. 1997a, b; Sadr & Sampson 2006; Sadr 2008; Smith 2008). Whilst there is general consensus that fibre-tempered pottery is forager authored (Schofield 1948; Bollong et al. 1993, 1997a, b; Sadr & Sampson 2006), there is less certainty surrounding the authorship of its grit-tempered counterpart. By focussing on the *pre-agriculturist* period in South Africa, we also exclude what is commonly referred to as 'Khoe' or 'Khoi' pottery (Rudner 1968; Bollong et al. 1997a; Sadr & Sampson 1999), which occurs later in the archaeological record (Jacobson & Vogel 1979) and is characterised as being coil built, with a pointed base, a shouldered-jar form with suspension lugs, a neck and everted lip, and having a general amphora-like shape (Jacobson & Vogel 1979; Bollong et al. 1993; Bollong et al. 1997a, b). In trying to understand who made the Drakensberg pottery, we pose and consider three questions.

Why did foragers want/need pottery?

The objective here is to draw on selected eastern and southern African examples simply to illustrate the many ways in which foragers use pottery. There are many accounts of both the manufacture and use of pots by Kenyan foragers. Grillo (2014) records that Kenyan Loliin make and use pottery for boiling food and medicines and storage of water, honey and beer. Another Kenyan forager group, the Kipchorn'onik, likewise make and use pottery for boiling and storage, for grinding snuff, and for serving and eating (Blackburn 1973). Similarly, observations are made by Brown (1989) for the Samburu Dorobo and by Huntingford (1929, 1942, 1955) for the Kamelilo-Kapchepkendi, who also use pots to boil plants for arrow poison.

Evidence of foragers using pottery in southern Africa is rarer. Bleek (1927) says that each Bushman household in central Angola has a clay pot for boiling beans, meal and meat. Dornan (1917: 46) describes "coarse pottery" made by the Tati (or Hiestshware) Bushmen of Botswana, who used these pots as water containers in the same way that ostrich eggshells are used more broadly by Bushmen groups.

Most accounts of East African foragers describe them making and exchanging their own pots. Hodder (1982: 92) describes a forager potter making pots to supply pastoralists and other forager groups. However, there are exceptions. Huntingford (1942, 1955) recorded that the Kamelilo-Kapchepkendi do not make pots but acquire them from their agriculturist neighbours (the Nandi) in exchange for animal skins. The Angolan Bushmen described by Bleek (1927) also acquire their pots from their Bantu-speaking agriculturist neighbours in exchange for skins and honey. Similarly, the exchange of a pot for a jackal *kaross* is recounted by the late 19th century |Xam Bushmen, alongside some local pottery production (Bleek & Lloyd 1911).

It is possible that the appearance of pottery in the northern Drakensberg is a consequence of the population and subsistence intensification and decreasing mobility that is believed to have occurred between 3000 and 2000 years ago (Mazel 1989). Pottery may have been used to store, cache or carry foods gathered at higher elevations, perhaps seasonally, as Eerkens (2003, 2008) observes amongst highly mobile foragers in North America. Eerkens (2008: 389) suggests that pots "tethered people to particular tracts of land" (because they were used to cache foodstuffs) and that residentially mobile groups would have "made consistent and repeated visits to the same area". The Drakensberg foragers may have been using pots for cooking, the storage of honey (Russell & Lander 2015b), or for the storage of seasonally available seeds: oil-rich and edible seeds were recovered from pottery-bearing units at Collingham Shelter (CLH) (Mazel 1992b). Mazel (1984a: 57) interprets the thicker sherds at Clarke's Shelter (CLK) as fragments of storage vessels.

Is this pottery made locally by foragers or is it acquired from pastoralists?

The Northern American Numa foragers of the Southwestern Great Basin, living in small, highly mobile groups, produce their own pottery and acquire little through exchange (Eerkens et al. 2002). Pots used by more mobile groups are generally light-weight, thinner, more fragile and less varied in size and shape than those made by more sedentary people (Eerkens 2008: 318). This matches the description of the Drakensberg pottery.

Fibre-tempered pots are often attributed to highly mobile people because they are lighter and easier to make than their mineral-tempered counterparts (e.g. Bollong et al. 1993; Sadr & Sampson 2006). However, the portability of non-fibre-tempered pots is demonstrated in Grillo's (2012, 2014) work among mobile Samburu pastoralists. Samburu pots are carried in a small basket of woven sticks (reminiscent of the Kalahari Bushmen transport of ostrich eggshells in a netted sack of plant fibre (Hollmann 2001)). Grillo finds, "a deep and perhaps unexpected integration of pottery use into a mobile lifestyle centred on the herding of livestock". Her observation contrasts with an apparent tacit acceptance in the "broader archaeological literature" that pastoralists "carry fewer heavy or breakable objects; [and that] they maintain an adaptively minimalist material existence", despite the fact that pottery and other heavy objects commonly occur in pastoralist archaeological contexts (Grillo 2014: 105–6). Pottery enables the Samburu to be pastoralists. They are defined by it. Pots become crucial in times of drought and hardship as vessels in which to boil otherwise unpalatable wild foodstuffs. Most Samburu pots are used for cooking. Pots are also central to certain ceremonies (Grillo 2012, 2014). Archaeologically, all pastoralist designated sites in East Africa have pottery (although how much of it is pastoralist-made is unclear) (Odner 1977; Bower & Nelson 1978; Collett & Robertshaw 1980; Wandibba 1990; Bower 1991; Robertshaw 1991; Marshall 2000; Karega-Mũnene 2002).

Under what circumstances would pastoralist pottery find its way into forager hands?

In our area, we do not believe there is any evidence to suggest that the northern Drakensberg foragers ever made pots, which appear rapidly on the landscape in a highly finished form, in relatively low numbers, and only at selected sites and then disappear. Such a pattern is more suggestive of the intrusion of the technology of a migrant group than local experiment and development (Bogucki 1997, 2000; for similar arguments in

other southern African contexts, see Kinahan 1991: 38; Schweitzer 1979; Sadr 1998: 116; Hall & Smith 2000). Hodder (1982: 95) describes how Samburu pastoralists take their own wooden vessels to foragers when they want honey, and thus offers an example of how pastoralist material culture might be introduced into a forager site. Equally, foragers may have collected a pot or potsherds from abandoned pastoralist camps. Mitchell et al. (2008: 56) describe broken potsherds being brought onto forager sites where they may have been used as "scoops, plates or scrapers". They may also have acquired them through exchange as they moved to different areas. We know that foragers moved over great distances. Ostrich eggshell, for example, which Thukela Basin foragers used for bead manufacture, probably came from the grassland of the southern Highveld (Maggs 1984a: 89; Mazel 1986b: 447, 1996, 1998; Whitelaw 2015: 158). At inland forager sites such as Mhlwazini (MWZ), contact with the coast (>180 km away) is evidenced in the marine shells from deposits dating 3000–2000 years ago.

The distinctive colour of the cores of the thin-walled sherds may also be suggestive of a pastoralist link and/or a link to people with livestock on the southern Highveld (i.e. the northeastern Free State). In northern Drakensberg assemblages, the core colour of thin sherds ranges from "grey-black to grey-brown", characteristic of dung-firing and distinct from the orange-coloured cores of the wood-fired agriculturist pottery of KwaZulu-Natal (Mazel 1984a: 57). However, in wood-impoverished environments such as the southern Highveld, the much later agriculturist pottery has similar greyish cores, thought to be associated with the use of dung for fuel (Maggs 1976: 87; Mazel 1984a). Is it possible that the core colour of pre-agriculturist cores represents a pastoralist habit rather than the lack of wood? We know that East African pastoralists commonly fire their pottery using livestock dung by choice rather than as an environmentally imposed sanction (Brown 1989: 79). Likewise, historically observed southern African pastoralists used "dry cowdung" for firing (Schofield 1948: 59).

PLACING THE PAINTED SHEEP INTO THE OCCUPATIONAL HISTORY OF THE NORTHERN DRAKENSBERG

This small, yet 'complete'[2] body of painted sheep rock art was recorded in the northern part of the Drakensberg during 2012 and 2013 (Lander 2014) (Fig. 9). Painted sheep are rare relative to other painted imagery, representing only a tiny fraction of the 40 000 individual paintings in the Drakensberg, as estimated by Wright and Mazel (2007). There are 75 painted sheep in our sample; of these 41 are white, 33 are red and one is red with white 'decorations'. This tally includes the 39 white sheep recorded in Pager's replication of a panel at Junction Shelter (housed at the Rock Art Research Institute, University of the Witwatersrand); of these, recorded in the late 1960s, only 14 were visible in 2013 (Pager 1971; Lander 2014). We do not believe the disappearance of sheep at Junction Shelter is a consequence of the poor quality of white paint, as Ward and Maggs (1994) describe for some colonial-period paintings. On a site visit in 2013, it was noted that some of the white motifs are still on the rock face, but are obscured by a thick dust layer. The sheep panel is also exposed to sunlight, and fires have been lit in the shelter. These factors need to be investigated further. Of course, sheep paintings have been painted over a shorter period of time than the larger body of forager art made for many millennia prior to this. However, we believe that if it were possible to quantify the number of forager-authored paintings over the last 2000

Fig. 9. (a) A white painted sheep occurs near to an eland, six human figures and a snake-like creature at Sigubudu 4. (b) Three of the white painted sheep that are still visible at Junction shelter.

years, the numbers of sheep motifs would still be very low relative to other subject matter. Given the ephemeral nature of certain types of white pigment (Ward & Maggs 1994; Pearce 2006; Mazel 2009) it is possible that more paintings of sheep existed in the past, although the low tally of sheep painted in the hardier red pigment suggests that sheep were simply painted in small numbers. It is also possible that other sheep paintings are yet undiscovered, particularly outside of the extensively surveyed World Heritage Site. For example, Hollmann (2015b) recorded a black sheep (associated with paintings of agriculturist things) at the site of eMkhobeni. We have not included eMkhobeni in our sample as we think that it is painted more recently (see discussion). We have also not included painted sheep from Lesotho because, although we are aware of four painted sheep sites in Lucas Smits's ARAL database, we do not know their geographic coordinates. Two other sites in Lesotho were excluded because they are associated with more recent historical imagery (Vinnicombe 1976).

We have argued elsewhere that these paintings of sheep[3] are old (Lander 2014; Russell & Lander 2015b): the context and manner of their painting contrasts with paintings that we know are more recent due to associations with horses and other datable exotic imagery such as shields and iron objects. This relative dating builds on the southern-northern Drakensberg divide in rock art proposed by Mazel in 1982. He convincingly suggested, based on a variety of variables in the rock art, that the art of the north was older than that of the south (cf. Vinnicombe 1976; Manhire et al. 1986). The northern Drakensberg sheep in our sample are painted in monochrome red or white, and often as single and unherded animals. The pigment with which they are painted is not powdery and binds well to the rock surface. Further, they do not have the blocked appearance and bright colours that are typical of later rock paintings (Vinnicombe 1976; Loubser & Laurens 1994). They are shown in a context and manner that is typical of forager rock art. This contrasts with later contact and colonial-period paintings of sheep, which are often shown in large herds, with other domestic animals (e.g. horses (Vinnicombe 1976)), and in association with people and other exotic items of material culture (e.g. shields (Loubser & Laurens 1994) and axes (Hollmann 2015b)). Exotic material culture is present at only one of the painted sheep sites in this study, namely, Battle Cave. We do not think that the sheep paintings at Battle Cave were made at the same time as the paintings of exotic material, because of differences in content and style, and because the painted sheep is 15 m away from the panel containing exotic material culture (Lander 2014).

If we now consider the spatial distribution of sheep sites in relation to other types of archaeological evidence, we can add another thread to our argument for the antiquity of sheep paintings. It has been assumed that the painted sheep are the result of forager encounters with agriculturist sheep and it follows from this hypothesis that the sheep could be placed on any of our maps of AD 350 onwards. However, there is only sparse evidence of foragers being in the vicinity of the painted sheep sites for much of this period. Only Clarke's Shelter (CLK) in the northern Drakensberg is occupied between AD 400 and 600. Clarke's Shelter is in close proximity to painted sheep sites and it is therefore possible that sheep paintings were made in this period, a time when the earliest agriculturists were on the landscape (although there is as yet no direct evidence of sheep in the archaeology of KwaZulu-Natal until the end of the 6th century AD).

There is slight evidence of an ephemeral forager occupation of the uplands of the Thukela Basin (close to the 1500 m contour) at just one site, Driel Shelter (DRL), at around AD 1000 (though this is not securely dated). For the period AD 1200–1500, there is once again very little evidence that foragers were using the northern Drakensberg in the vicinity of the painted sheep sites: the site of Esikolweni (EKW) dates to the end of this period based on a radiocarbon date from plant fibre found embedded in paint from a white and orange eland (Mazel & Watchman 1997), and the uplands site of Mhlwazini (MWZ) dates to the AD 1300s and 1400s. So, were agriculturists' sheep painted at any of these times? If the sheep paintings were made at the time that Clarke's Shelter (CLK) was occupied then this would mean that foragers were recording their encounters with sheep belonging to early coastal agriculturists (for example, at the sites of Enkwazini (ENK) and Mzonjani (MZ), and Inanda Quarry (IQ)) ahead of any archaeological evidence for contact between farmers and foragers. This is a possibility. But why, then, were foragers painting sheep and no other agriculturist items? We return to this issue in the next section.

From about AD 600 to 900, forager and agriculturist settlements are focussed on the central Thukela Basin, below the 1000 m contour, and sheep bones are present at a number of agriculturist sites from the end of the 6th century AD onwards. However, two factors count against foragers painting images of sheep at this time—there is a complete absence of painted sheep in the central Thukela Basin, although there are other paintings at, for example, the sites of iNkolimahashi (NKM) and kwaThwaleyakhe (KTK) (of course, we cannot know when these paintings were made). This suggests that foragers were not interested in painting sheep in this area. Further, during this period there is no evidence of forager activity in the area where painted sheep are found. On the balance of evidence, we think it unlikely that foragers were travelling to the northern Drakensberg sites to paint sheep. From AD 1200 onwards, there is once again ephemeral evidence of the occupation of upland areas of the Thukela Basin, in closer proximity to the sites with sheep paintings. However, we do not believe that sheep were painted during these times either. This is because the style and manner of depiction of painted sheep are entirely different to motifs that are known to be painted during this time period based on relative chronologies and a direct radiocarbon date on rock art. For instance, the character of the Esikolweni (EKW) eland, dated to the end of the 15th to 17th centuries AD, matches that of the youngest category of eland, as determined by relative dating, at Main Caves North (MCN) (Russell 1997, 2000), as well as Vinnicombe's (1976: 133) final Phase Four paintings, based on her survey of the southern Drakensberg rock paintings (cf. Loubser & Laurens 1994; Mazel 2009).

We turn now to the evidence for the period prior to the arrival of agriculturists to KwaZulu-Natal. The spatial distributions show that the evidence for forager occupation of places in the vicinity of painted sheep sites is greatest before AD 350 (Figs 1, 2). An alternative source of sheep is provided during this period, based on the proxy evidence of thin-walled pots that pastoralists were around. So, we have two strong contenders for the source of forager-authored sheep paintings: either they were pastoralist sheep from the turn of the 1st millennium BC, or they belonged to agriculturists of the 4th to 6th centuries AD. In trying to weigh up these two alternatives, we discuss human-animal relationships as interpreted from the sheep paintings in the next section.

Using human-animal relationships to understand this body of painted sheep

Ingold (2000: 69, 72) sees the transition from foraging to pastoralism as one that involves a fundamental shift in human-animal relationships: they change from one of trust (in the case of forager-animal relations) to one of domination under pastoralism (although he acknowledges one ethnographically observed exception (Ingold 2000: 422)). He depicts the pastoralist relationship to the herd animal as that of master to slave. Smith (2014: 9) adopts this idea in elaborating the barriers to foragers becoming pastoralists (see Smith 1990). A large body of ethnography challenges this slavery metaphor. Fijn's (2011) etho-ethnographic study of Mongolian herders emphasises how similar their relations with animals are to those of animist foragers in Siberia. She writes of this "co-domestic relationship" as the "social adaptation of animals in association with human beings by means of mutual cross-species interaction and social engagement" (Fijn 2011: 19). She emphasises trust, respect, control, reciprocity and close proximity (Fijn 2011). These kinds of relationships are not easily captured in the archaeology, but this should not preclude us from considering how they might have played out in the past. Closer to southern Africa, there is an abundance of ethnography from modern-day East Africa that captures pastoralist-animal relations as father-child, idolization, self-identification with animals, and even herder subservience to animals (Evans-Pritchard 1953; Robbins & Robbins 1971; Maquet 1972; Deng 1973; Barrett 1997).

We therefore raise the possibility that the relations of the first southern African pastoralists with their animals were not very different from those of foragers with animals. Indeed, the relationship between pastoralists and domestic animals was of so little consequence to foragers that it is not recorded in this body of rock art. Of more interest to the foragers, as reflected in their paintings, were the alien animals. We believe that these paintings reflect the incorporation of sheep into the forager worldview. Properties such as hide colour and fatness would have made their potency immediately familiar to foragers (Russell & Lander 2015a, b).

We suggest that the similarity in forager and pastoralist human-to-animal relationships can be extended to material culture, which is so similar that it is often extremely difficult to distinguish the archaeological signature of the two kinds of societies (Orton 2012, cf. Smith et al. 1991). Might this explain the apparent absence of exotic material culture in the sites that contain these arguably early paintings of (pastoralist?) sheep (e.g. Sigubudu 4, Boschmansklip, Zunckels Cave, Battle Cave and Junction Shelter), with pastoralist things so similar to forager things that they cannot be distinguished. Conversely, we can identify exotic material culture in the sites with more recent, agriculturist-influenced depictions of sheep (e.g. eMkhobeni (Hollmann 2015b)). It is on this basis that we favour the early pastoralist source of sheep over the slightly later agriculturist source (Fig. 10).

Rock art of a branded sheep: further evidence of pastoralist influence?

At Battle Cave there is a painting of a red, fat-tailed sheep with white geometric marks around the eye and onto the neck and back (Fig. 11). The placement of the markings on this sheep is reminiscent of the placement of brands by modern-day Turkana onto their livestock[4] (Fig. 12) (Barrett 1997; Russell & Kiura 2011; Russell 2013). Modern-day East African pastoralists mark their livestock by branding geometric motifs onto their hides or by cutting patterns into their ears. This is not a mark of ownership,

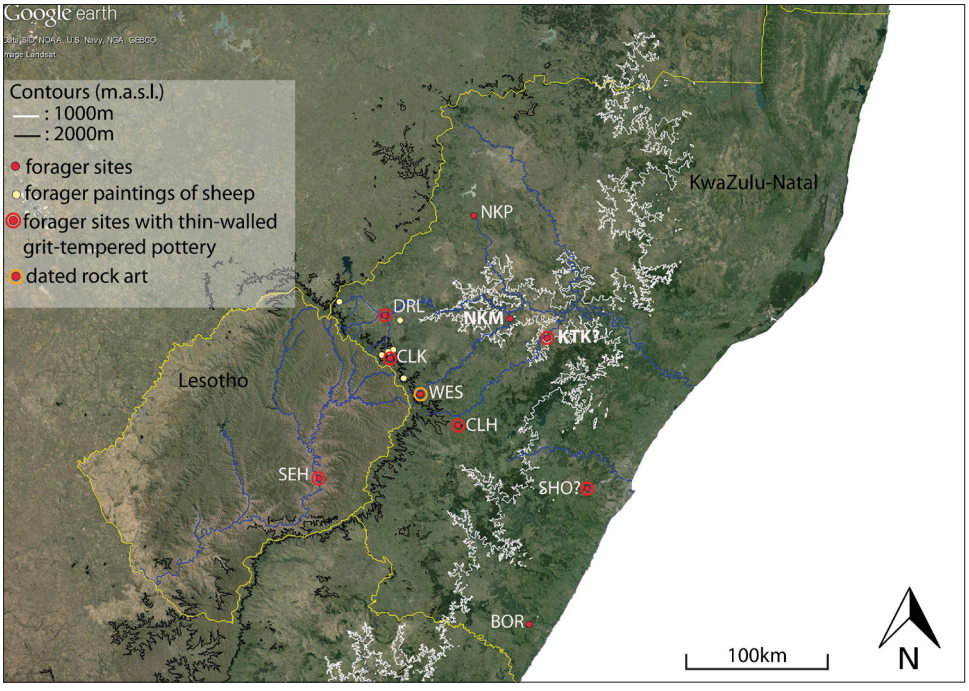

Fig. 10. AD 1–350. The known archaeological landscape at the time that sheep may have been first seen and painted.

but of belonging to clan, lineage, ancestors and the supernatural world (Tomikawa 1972; Russell 2013).

In southern African forager rock art, geometric shapes are interpreted as entoptic phenomena (as seen during hallucination) that are interpreted through the cultural filter of the viewer (known as construals) (Lewis-Williams & Dowson 1988, 1989: 63; Lewis-Williams 1995, 2002). Such geometric marks occur juxtaposed against an animal or intricately painted as part of the animal (Lewis-Williams & Dowson 1988) (Fig. 13). Lewis-Williams (1995) notes that the majority of animals with 'marks' or 'decorations' in paintings, are not animals of the everyday but rather of the spirit world. If foragers witnessed an unfamiliar animal in the everyday that bore a similar potent mark it must have had a significant impact on them. It would have been unfamiliar but interpretable.

It is plausible that the Battle Cave sheep is a painting of a branded sheep (as witnessed by foragers in the everyday). Such an interpretation does not exclude the possibility that the painter recognised them as the sorts of shapes seen in trance rather than brand marks. Indeed, that sheep bore potent entoptic symbols must have added to their perceived potency in the eyes of their forager painters. As Lewis-Williams and Dowson (1988: 213) note, "even novel construals may have been familiar to southern African foragers because they would have been seen as belonging to the beliefs surrounding the shaman".

Smith and Ouzman (2004) hypothesize that much of the geometric rock art in southern Africa has a pastoralist authorship. Is it possible that some of the geometric



Fig. 11. White markings made on a single red fat-tailed sheep.

marks that they have identified are in fact brand marks? In East Africa, pastoralists are known to reproduce brand marks and other geometric marks on rock surfaces (Robbins 1972; Gramly 1975; Chamberlain 2006; Russell 2013). We may never know whether the first livestock entering southern Africa were branded. There are hints that this may have been so from historic accounts. In the Cape Colony, "both settler and black livestock owners had for a long time marked their animals to indicate their ownership", and that "these were usually ear marked, generally paint marked, and sometimes branded with signs or letters" (Van Sittert 2014: 85–6). Schapera (1930: 293) writes that in the early 19th century, the Cape Khoe marked their cattle "in special ways, by cutting, perforating, and lopping the ears". This was, he says, not to do with marking ownership because "everybody knows the animal he possesses, so that confusion is hardly likely to occur."

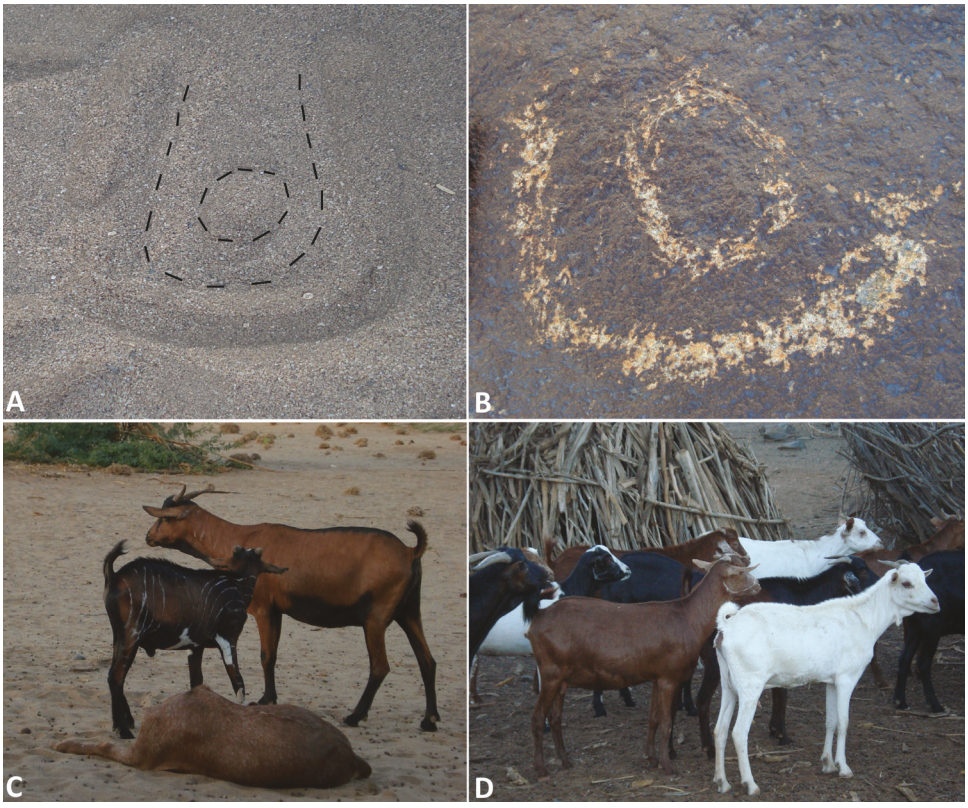

Fig. 12. Livestock branding recorded amongst the Turkana, Northern Kenya in 2009. A. A brand mark as drawn in sand by a Turkana clan member during interview. B. The same brand as engraved on rock in the vicinity of the interview. C. Turkana goats with brand marks. D. The brand mark as recorded in A and B, as it appears branded around the eye of a goat of that clan.

IMPLICATIONS FOR THE HUNTER-TO-HERDER DEBATE IN SOUTHERN AFRICA

Preliminary analysis suggests that meaningful patterns are revealed when the distribution of early grit-tempered thin ware is considered alongside the distribution of early sheep bones and their proxy in the northern Drakensberg—early paintings of sheep. This is of potentially wider significance and could possibly be extended to the Eastern and Western Cape where sheep paintings are thought to be early (Hall 1986; Manhire et al. 1986) and possibly also to the Limpopo province (Hall & Smith 2000). We raise two excavation patterns that we believe deserve more attention and bring a previously overlooked pottery type to centre stage in the hunter-to-herder debate.

First, at all South African sites with early sheep bones there is also a finely made, grit-tempered thin ware (which is different from the more recent 'Khoe' pottery) (e.g. Schweitzer 1979; Klein 1986; Hall & Smith 2000). The first appearance of sheep is not associated with fibre-tempered ware. Secondly, rock art sites with sheep paintings that are deemed old are found in close proximity to sites with grit-tempered pots (both in KwaZulu-Natal and the Eastern Cape (Hall 1986)). Sealy and Yates (1994, 1996) showed that sheep bones move in the deposit. Direct dating proved that they are sometimes

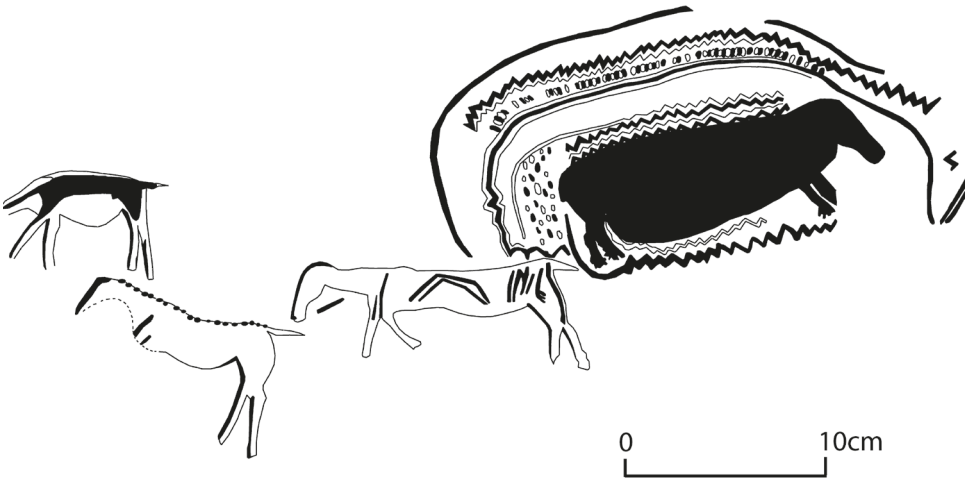

Fig. 13. A re-drawing of entoptic phenomena and construals recorded in the Harrismith District by Lewis-Williams (1985: 50, fig. 8).

younger than the deposits in which they are found. These findings led them to question whether sheep and pottery appeared on the landscape at the same time. However, the striking coincidence of sheep bone and pottery at so many sites made us revisit their work. What they do not consider is that pottery would have been as susceptible to movement as sheep bone. Thus, the sherds could be of equal antiquity to the sheep bones and as intrusive of the older layers. Experimental studies on vertical displacement suggest this to be highly likely (particularly in the sandy matrices in which many of these finds are found) (Villa & Courtin 1983; Gifford Gonzalez et al. 1985; Staurset & Coulson 2014). Support for the contemporaneity of sheep bones and pottery is found at sites with secure stratigraphic contexts and dating where they occur together (e.g. Blombos (Henshilwood 1995) and Boomplaas (Deacon et al. 1978)).

Stylistic approaches that focus on pottery decoration are problematic in the context of the hunter-to-herder debate because most early grit-tempered pottery is undecorated (see also Smith 2008). Undecorated pottery and its variables have, until now, been too quickly dismissed in the debate. For example, Sadr (1998: 105) separates "functional and technological attributes" (such as "Spouts, size of vessels, thickness of walls, and firing conditions") from "stylistic similarities in decorations and form of vessels"—because only the latter will identify people with a shared language. The absence of a "stylistic chain" is used to dismiss an early Khoe migration (ibid.). There are problems with this reasoning—it assumes that archaeologists can separate function and style. Sadr (1998), for example, classes spouts as functional and handles as stylistic and, indeed, Samburu pots have two horizontally orientated handles (i.e. lugs or 'ears'), which Samburu women say they use to lift the pots from the fire, a seemingly functional explanation (Grillo 2012). However, Grillo (2012: 210) goes on to reveal that so closely linked are lugs and Samburu pastoralist identity that, when a Samburu needs a pot for ceremonial purposes and has only a 'deaf' non-Samburu pot available, two dung lugs are fashioned onto it. This tight link between Samburu identity and lugs is demonstrated further when

Grillo (2012: 156) shows a pot with *vertically* orientated lugs to a group of Samburu. She describes their reaction, "It is so inconceivable that a Samburu pot should be shaped like this that a group of elder men near Barsaloi needed to take a very long and close look at its photograph to confirm that it was, in fact, a clay pot", but made by "some other tribe" (ibid.). It is intriguing, therefore, that Hart (1989: 167) notes in his comparison of "Khoi" pottery with grass-tempered pottery at sites in the Zeekoe Valley that, "the poor functional design of grass tempered lugs may reflect the fact that these fixtures may have been purely decorative borrowings from the makers of Khoi pottery in the area".

There is no evidence that the northern Drakensberg foragers adopted stock-keeping despite interacting with stock-keepers over hundreds of years. They thus provide an example of foragers who rejected stock over hundreds of years, comparable to northern European foragers who resisted the transition to farming for a thousand years (Zvelebil & Rowley-Conwy 1984). We have noted elsewhere that the northern Drakensberg sheep appear to have been seamlessly integrated into what we would consider to be the typical repertoire of northern Drakensberg forager rock art (Russell & Lander 2015b). We know that forager rock art is symbolic and ritualistic in nature, thus by virtue of the context of their painting, the sheep are too (Maggs 1967; Vinnicombe 1976; Lewis-Williams 1981, 1982, 1998; Maggs & Sealy 1983; Yates et al. 1985; Guenther 1988; Lewis-Williams & Dowson 1989; Hall & Smith 2000; Jolly 2007). This body of rock art thus provides an interesting comparative dataset to the later rock art of those foragers (specifically forager shamans) who are understood to have acquired cattle (and kept them?) in exchange for rainmaking services to agriculturists, and thus acquired prestige (Campbell 1987; Dowson 1994; Jolly 2007).

DISCUSSION

This project began as an exercise to try to understand when and why sheep were painted—part of our wider aim to contextualise livestock-related archaeology in time and space, so as to draw rock art into the hunter-to-herder debate. During the spatial mapping exercise a number of other findings were thrown up. We expand on each of these below.

Are agriculturist settlements always magnets to forager settlement?

When interpreting situations wherein foragers and agriculturists share the landscape, archaeologists commonly describe forager movement in response to food producers (Hall 1994; Mitchell et al. 1994; Mazel 1998, 2009; Wright & Mazel 2007). No doubt this pattern can be demonstrated in other study areas, but it was not seen in this case. In KwaZulu-Natal, it is thought that the *central* Thukela Basin was sparsely occupied ahead of an agriculturist presence and that settlement increased upon agriculturist occupation of this area (Mazel 1989, 1996, 1998). Thus, in summarising forager and agriculturist settlement patterns in the Thukela Basin, Hollmann (2015b: 508) states that, "hunter-gatherers organised themselves around the edges of the first agriculturist settlements in the central Thukela Basin; this association persisted even as agriculturists started to settle in the high-altitude grasslands adjacent to the foothills of the northern uKhahlamba-Drakensberg". Similarly, Mazel (1998: 5) states that the "spatial and chronological distribution pattern of rock shelters occupied by the hunter-gatherers

during the last 1500 years shows that hunter-gatherers vacated the Drakensberg around AD 500 following the arrival of agriculturists in the lower and central Thukela Basin" (see also Mazel 2009: 88). What our data presents is a very consistent use of the *central* Thukela Basin that predates and continues with the arrival of the first farmers (i.e. iNkolimahashi (NKM), kwaThwaleyakhe (KTK) and Mbabane (MBB) shelters). Spencer (1973: 205) describes East African forager groups whose ties to particular areas might be more important than those of food producers—the result is that they do not move in response to food producers. It could be argued then that when agriculturists arrived in the central Thukela Basin they had to arrange their settlements around forager spaces (we return to this point later). There is, however, slight evidence for an exodus from the central basin upon farmer settlement at the beginning of the 7th century AD, occupation ceases at Mbabane Shelter (MBB) while Gehle (GEH) and Sikhanyisweni (SKW) appear a distance away from the central basin (Fig. 6).

This is a slight but important shift in thinking about relations that may have prevailed in the first millennium AD in southern Africa, especially in situations where people are entering an unfamiliar and populated landscape for the first time. It also challenges the perception that foragers are subservient to food producers in all encounters (see Russell & Lander 2015a: 273). Rockman (2003: 18) argues that one of the challenges to colonizing agriculturists is that plant-related information may not be transferable, "even small variation in climate and topography in newer areas may lead to substantial alterations in location, distribution and scheduling of plant resources, which in turn may require substantial alterations in social organization and knowledge". Alternatively, the first KwaZulu-Natal agriculturists may have been expanding with targeted areas in mind, as seems to be the case from the very specific environmental preferences shown by the earliest agriculturist communities (Maggs 1984b, 1994–95). Thus their challenge was not in environmental variation, but rather in that they were moving into occupied space. This inflexibility in settlement choice would have placed more weight on them successfully negotiating their way into these desired patches. One of the ways that such negotiations may be revealed is in the spatial distribution of material items exchanged between foragers and farmers, which takes us to our next point.

Changing exchanges

From the very earliest time that agriculturists arrive in the Thukela Basin, things that once belonged to them are found at forager sites and *vice versa* (Mazel 1986b, 1993, 1997, 1998). We noticed two patterns in the nature of material-culture exchanges that require further investigation. The forager site of Mbabane (MBB) in the central Thukela Basin contains the earliest agriculturist material. During the time that people are living at Mbabane Shelter, the agriculturist site of Wosi (WOS) appears as the earliest known and dated agriculturist site in the lower Thukela Valley and it contains items of forager origin (see Table 4 for detail of items exchanged). We wonder whether these two assemblages are representative of the initiation of amicable relations between these two groups during the 6th to 7th centuries AD and the start of negotiations by agriculturists to settle the desired areas further up the river valley. Such exchanges may also have included items, such as honey, skins and milk, that do not survive well in the archaeological record (we know, for example, that sorghum was exchanged as it is preserved in rare instances). From this time onwards we see little change in the nature

of exchange; both agriculturist and forager sites consistently contain small assemblages of exotic material, although there is an increase in the number of sites involved in such exchanges. For example, for the period AD 650–1200 almost every dated archaeological site shows evidence of exchange. We call this pattern 1.

The second pattern we observe appears during our final time period (AD 1200–1500). Of the eight forager occupation sites, six contain agriculturist material. However, for the first time, not a single agriculturist site shows evidence of receiving the forager-authored items that were seen in earlier exchanges. We raise the possibility that this represents the exchange of goods for services—that foragers were exchanging their services, for example as ritual practitioners (healers perhaps), in return for agriculturist things (Wright 1971, Jolly 2007, Whitelaw 2015). Hollmann's (2015b: 529–30) interpretation of the forager-painted site of eMkhobeni (which depicts the slaughtering of a black bull, a black sheep and agriculturist-related material) is suggestive of the ritual power with which foragers may have been associated by the agriculturists. Hollmann's estimated date range for the eMkhobeni paintings is AD 1350–1800. We think they may fit within the AD 1200–1500 period or possibly earlier.

If Pattern 2 exchange existed, then it might perhaps be suggestive of the changing nature of agriculturist-forager exchanges rather than a decrease in the intensity of exchange during the second millennium AD (cf. Wright & Mazel 2007: 47–8). The possibility remains, however, that foragers were exchanging non-durable products such as honey and skins for more durable agriculturist products in the later periods.

Occupational hiatus or survey bias?

Mazel (1989, 1992b) has observed that there is no evidence that the northern Drakensberg was occupied from 1600 to 600 years ago (a pattern our mapping exercise supports), although he does not rule out the possibility that people were still visiting the area. Lewis-Williams and Pearce (2004) have suggested that foragers would have sought out isolated shelters in which to conduct certain rituals, for example, those for rain control. The many painted sites without deposit also confirm that non-occupation does not necessarily equate to a lack of painting. However, none of the admittedly small sample of nine dated rock paintings from the northern Drakensberg fall within the hiatus period (Mazel & Watchman 1997, 2003), lending support to the idea that people had not only stopped living in the northern Drakensberg, but that they had also stopped painting there (see Mazel 2009).

However, we are still unsure as to whether this pattern reflects a real hiatus or survey bias. It also raises further questions—where did the northern Drakensberg foragers go? We found no evidence for a concomitant increase in forager sites outside of the northern Drakensberg during the hiatus, at least not in KwaZulu-Natal. Might the pattern reflect a move from rock shelters to open-air sites rather than a population exodus (see Mitchell et al. 1994; Mitchell & Charles 1996; Arthur 2008)? The only open-air forager site in this paper is the site of Likoaeng in Lesotho. All the other forager sites mentioned are rock shelters. To try to investigate these questions we have plotted all the undated and unpublished Later Stone Age sites recorded in the KwaZulu-Natal Museum database (Fig. 14). This map shows that only rock shelters have been recorded in the Drakensberg mountain range, which reflects the bias towards rock art research in this area. The complete absence of open-air sites must be an artefact of survey rather

than past reality. Support for this is found in those areas, outside of the Drakensberg, that have been extensively foot surveyed—they stand out on the map as clusters of open-air sites with some rock shelters (labelled A and B, Fig. 14) For example Area A reflects Penner's (1970) survey of the Umfolozi-Hluhluwe Game Reserve. Area B similarly shows the increase in open-air sites recorded following extensive survey—in this case salvage survey ahead of the construction of the Woodstock Dam (Mazel 1981).

Distinguishing between groups with different subsistence bases

Because material is exchanged between foragers and farmers it becomes difficult to distinguish between these two groups during the second millennium AD when their ephemeral traces are found in rock shelters (Mazel 1993, 1997, 1999; Wright & Mazel 2007). This problem extends to separating potentially pastoralist pots from agriculturist pots in later time periods, because the later agriculturist pots can also be thin-walled and undecorated (e.g. of the *Ndondondwane*, *Ntshekane* and *Blackburn* facies; Whitelaw pers. comm.).

CONCLUDING THOUGHTS

Mazel (1992a, 2013) raised the possibility that pastoralists passed through or close to KwaZulu-Natal about 2000 years ago, arguing that the thin-walled wares (and finger painting, not discussed here) are proxies for their presence. It is possible that this pastoralist presence has been missed because it does not fit the expected pastoralist

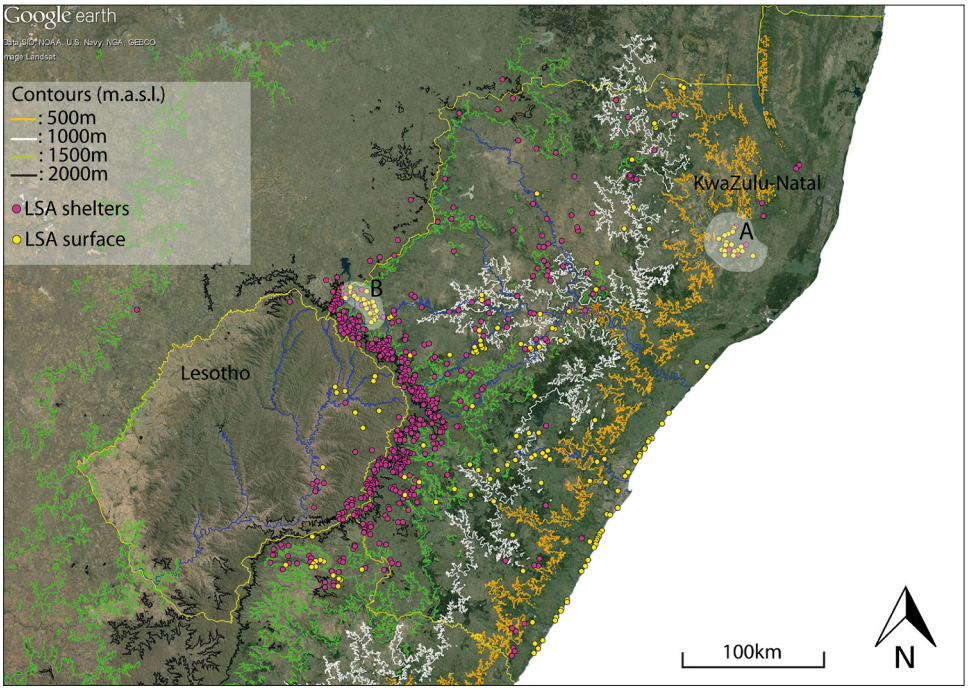

Fig. 14. The distribution of undated Later Stone Age sites recorded in the KwaZulu-Natal Museum database reveals the bias towards rock shelters in the Drakensberg and the effects of intensive foot survey (areas A and B).

signature (Russell & Lander 2015a). A further possibility is that foragers saw pastoralists and their animals on their journeys into the highveld grasslands to the north-west of KwaZulu-Natal. We believe that the painted sheep and pieces of pots found at northern Drakensberg sites are a record of these first encounters with outsiders, some 2000 years ago, and that the paintings record the impact of new animals and their seamless integration into the foragers' own worldview.

What is evident is that more sites must be excavated with better stratigraphic control and direct dating before these questions can be resolved. More experimental archaeology that investigates post-depositional movements of pottery and bone is required, as well as a more detailed analysis of early, undecorated, non-fibre-tempered pottery (e.g. Couzens & Sadr 2010). Patterns that we suggest here may be overturned with a larger dataset and better techniques. For the time being we conclude, using the words of Leslie Brooker (1987: 226), that "it is tempting to propose that at Uniondale [and across South Africa] we see the initial acquisition by foragers of finer, grit tempered wares made by established potters who were probably pastoralists" (our insertion). These may have been the people who brought their genes, the first domestic livestock, of which we see paintings in the northern Drakensberg, and finely made pots to some parts of South Africa at around 2000 years ago.

NOTES

[1] In some cases what is described as grit-tempered may reflect the natural clay profile, rather than added temper. The important distinction is that we are writing about non-fibre-tempered pottery. Therefore we use 'grit-temper', acknowledging that the temper may be natural inclusions in the clay and not temper at all.

[2] This paper discusses all the recorded sheep paintings in the World Heritage area. Although this area has been extensively surveyed there may be unrecorded sheep paintings yet to be discovered.

[3] Cattle paintings are contemporaneous with sheep at one of the sites discussed here. They also occur at another sheep site where their contemporaneity with sheep cannot be established. We believe, like Mazel (1982) and Whitelaw (2015), that cattle paintings are old in this region.

[4] We do not think that the painted dots on a sheep at the site of eMkhobeni represent similar brand marks to those seen on the sheep at Battle Cave. The dots and flecks on the eMkhobeni sheep are reminiscent of the dots and flecks commonly associated with depictions of trance within San rock art. For example, in their discussion of rain-animals and rain-controllers, Lewis-Williams and Pearce (2004: 205) describe a rain-animal that, "resembles an eland antelope, yet it has rows of tiny white dots on its head, neck, body and hindquarters".

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TABLE 1

Details of non-agriculturist pottery finds at eight sites in the study area. Single question marks denote the insecure association between potsherds and radiocarbon determinations. The table is ordered chronologically.

Site	Pottery description	Radiocarbon Determination (years b.p.) and laboratory number	Stratigraphy	Number of potsherds at first occurrence	Comment on dating and context	Reference
Mhlwazini Shelter (MWZ)?	Four very small potsherds.	2280 ± 50 Pta-4868	Layer 5	4	Mazel (1990: 112) states the pottery could be intrusive from younger layers. Disturbed contexts (Mazel 1992b: 4).	Mazel 1990, 1992a
Moshebi's Shelter (MOS)?	One piece of pottery.	2180 ± 45 Pta-319	Spit 4, Layer 2	1	–	Carter 1977
Clarke's Shelter (CLK)	Nine potsherds from Layer 3; mean thickness: 7.78 ± 1.13 mm. One has a dark burnish. All are undecorated. Core colour of sherds is grey to black or grey to brown.	2160 ± 50 Pta-2971	Layer 3	9	"Even if it is argued that the pottery in Layer 3 is intrusive and does not date to 2000 years BP there can be no doubt about the *in situ* nature of the pottery in Layer 2 (dated to 1580 ± 50 years BP) which predates the advent of the LIA" (Mazel 1984a: 58). Mazel (1992a: 49) later "questions the tentativeness with which I had previously suggested even earlier dates from this region. I now suggest that we can attach more weight to the 2160 BP … dates for pottery from Clarke's Shelter".	Mazel 1984a, 1992a
Good Hope Shelter (GH)?	35 sherds from Layer 1 and the top of Layer 2. Thickness ranges from 5 to 16 mm.	2160 ± 40 Pta-838	Layer 2, Square B4, Spit 3	Less than 35	Layer 2 and Layer 1 pottery assemblages are not distinguished in the site report.	Cable et al. 1980
Collingham Shelter (CLH)	There are 37 potsherds at this site. The sherds are grit-tempered. One sherd shows the coil technique. One pot is bag-shaped. The sherds are all undecorated. Some have plain burnish.	1880 ± 45 Pta-5101	BSV3	1	The association of radiocarbon determination to potsherd is considered to be secure.	Mazel 1992a

TABLE 1 (*continued*)

Details of non-agriculturist pottery finds at eight sites in the study area. Single question marks denote the insecure association between potsherds and radiocarbon determinations. The table is ordered chronologically.

Site	Pottery description	Radiocarbon Determination (years b.p.) and laboratory number	Stratigraphy	Number of potsherds at first occurrence	Comment on dating and context	Reference
Driel Shelter (DRL)	There are >113 sherds at the site. They have a fine to coarse grit temper. Some are bag-shaped vessels. The 14 sherds from the dated layer 3 have a mean thickness of 8.21 mm. The older sherds are grey to black in colour, undecorated and with a greyish core colour.	1775 ± 40 Pta-118	Layer 3 (Older Ash)	14	The association of radiocarbon determination to potsherd is considered to be secure.	Maggs & Ward 1980; Mazel 1992a, 1992b
Sehonghong (SEH)	A total of 288 potsherds. Mean thickness: 7.8 ± 1.6 mm. Grit-tempered, undecorated. Grey to black in colour. Burnished and unburnished. Rims are flat and straight suggesting U-shaped vessels. Not well fired.	1710 ± 50 Pta-6063	Base of layer GAP	52	This is a *terminus post quem* for pottery at this site.	Mitchell 1996
kwaThwaleyakhe (KTK)?	There are 113 sherds at this site. Thickness averages 7–8 mm. Layer 3 contains 37 sherds, of which 14 are burnished. Layer 3 is potentially the most secure and oldest pottery layer.	Between 2640 ± 50 (layer 4) (Pta-5349) and 1290 ± 50 (layer 2) Pta-5350	Layer 3 is undated but lies between two dated layers	37	There is a possibility that these sherds are *in situ* and belong with early pre-agriculturist pottery. However, the stratigraphy is disturbed and more secure dating and association is needed at this site.	Mazel 1993

TABLE 2

Forager sites that are dated to the period 1000–1 BC and displayed on Figure 2. All the dated rock art is considered to be of forager authorship. A question mark indicates an uncertain association between a site's dates and the material of interest. All of these sites are rock shelters.

Site Name	Radiocarbon determination and laboratory number	Calibrated date (yrs BP) 1 sd	Calibrated date (yrs BC/AD) 1 sd	Stratigraphic context	Material culture exotic (?) to site	Other	Source
Mzinyashana (MZY)	2930 ± 20 Pta-6539	3061–2968	1112–1019 BC	Layer 8	–	–	Mazel 1997
	2840 ± 60 Pta-6708	2968–2795	1019–846 BC	Layer 7	–	–	
	2630 ± 60 Pta-6700	2775–2507	826–558 BC	Layer 7	–	–	
	2260 ± 50 Pta-6542	2315–2157	366–208 BC	Layer 6	–	–	
Umhlatuzana (UTA)	2840 ± 60 Pta-4215	2968–2795	1019–846 BC	Layer 3	–	–	Kaplan 1990
Diamond 1 (DIA)	2810 ± 60 Pta-2977	2929–2785	980–836 BC	Layer 1	–	–	Mazel 1984a
Mhlwazini (MWZ)?	2760 ± 60 Pta-5045	2865–2759	916–810 BC	Layer 6	–	–	Mazel 1990
	2280 ± 50 Pta-4868	2332–2160	383–211 BC	Layer 5	4 non-agriculturist potsherds	–	
Main Caves North (MCN)	2760 ± 75 OZD 448	2918–2753	969–804 BC	Crust underlying paint	–	This is a rock art date	Mazel & Watchman 2003
	2360 ± 70 OZD 449	2462–2180	513–231 BC	Crust underlying paint	–	This is a rock art date	
kwaThwaleyakhe (KTK)	2640 ± 50 Pta-5349	2782–2540	833–591 BC	Layer 4	–	–	Mazel 1993
iNkolimahashi (NKM)	2520 ± 50 Pta-7232	2711–2486	762–537 BC	Layer 7	–	–	Mazel 1999

TABLE 2 (*continued*)

Forager sites that are dated to the period 1000–1 BC and displayed on Figure 2. All the dated rock art is considered to be of forager authorship. A question mark indicates an uncertain association between a site's dates and the material of interest. All of these sites are rock shelters.

Site Name	Radiocarbon determination and laboratory number	Calibrated date (yrs BP) 1 sd	Calibrated date (yrs BC/AD) 1 sd	Stratigraphic context	Material culture exotic (?) to site	Other	Source
Nkupe (NKP)	2480 ± 60 Pta-3443	2696–2359	747–410 BC	Layer 3	–	–	Mazel 1988
Clarke's (CLK)	2380 ± 50 Pta-3247	2459–2312	510–363 BC	Layer 3	–	–	Mazel 1984a
	2160 ± 50 Pta-2971	2155–2012	206–63 BC	Layer 3	9 non-agriculturist potsherds (7.78 ± 1.13 mm)	–	
Belleview (BEL)	2330 ± 60 Pta-292	2356–2163	407–214 BC	Layer 3	–	–	Carter 1977
Moshebi's (MOS)?	2180 ± 45 Pta-319	2297–2049	348–100 BC	Spit 4, Layer 2	1 non-agriculturist potsherd	–	Carter 1977
Good Hope (GH)?	2160 ± 40 Pta-838	2151–2020	202–71 BC	Layer 2	35 non-agriculturist potsherds (5–16 mm).	–	Cable et al. 1980
Highmoor (HGM)	2310 ± 70 OZD 450	2350–2160	401–211 BC	Crust underlying paint	–	This is a rock art date	Mazel & Watchman 2003
Borchers (BOR)	2070 ± 50 Pta-3108	2050–1924	101 BC–AD 27	Layer 3	–	–	Cable 1984
Shongweni (SHO)?	Undated	–	–	Layers 4 and 5	undiagnostic potsherds (8–17 mm)	These layers fall between layers dated to 3870 ± 60 yrs BP and 1770 ± 60 yrs BP	Davies 1975
Didima Gorge sites (DID) (Esibayeni, Shirley, Botha's, Junction, Poacher's)	Undated	–	–	–	–	These sites are relatively dated using lithics	Pager 1971; Mazel 1984a

TABLE 3

Forager sites that are dated to the period AD 1–350 and displayed on Figure 4. All the dated rock art is considered to be of forager authorship. A question mark indicates an uncertain association between a site's dates and the material of interest. All of these sites are rock shelters.

Site Name	Radiocarbon determination	Calibrated date (yrs BP) 1 sd	Calibrated date (yrs BC/AD) 1 SD	Stratigraphic context	Material culture exotic (?) to site	Other	Source
Borchers (BOR)*	2070 ± 50 Pta-3108	2050–1924	101 BC–AD 27	Layer 3	–	–	Cable 1984
iNkolimahashi (NKM)*	1990 ± 60 Pta-7384	1995–1832	46 BC–AD 118	Layer 6	–	–	Mazel 1999
White Elephant (WES)	1930 ± 65 OZD 452	1897–1741	AD 53–209	Crust covering paint	–	This is a rock art date	Mazel & Watchman 2003
Collingham (CLH)	1880 ± 45 Pta-5101	1826–1723	AD 125–228	BSV3	1 non-agriculturist potsherd	Mean thickness 5.88 mm	Mazel 1992b
	1830 ± 50 Pta-5098	1810–1613	AD 140–337	GAD	–	–	
	1810 ± 60 Pta-5265	1745–1591	AD 205–360	BSV 1	5 non-agriculturist potsherds	Mean thickness 5.88 mm	
	1800 ± 50 Pta-5096	1724–1594	AD 227–356	BSV2	3 non-agriculturist potsherds, 2 copper beads	The beads may be intrusive	
	1770 ± 50 Pta-5274	1702–1588	AD 248–362	VP2	1 non-agriculturist potsherd, 1 iron bead	As above	

TABLE 3 (*continued*)

Forager sites that are dated to the period AD 1–350 and displayed on Figure 4. All the dated rock art is considered to be of forager authorship. A question mark indicates an uncertain association between a site's dates and the material of interest. All of these sites are rock shelters.

Site Name	Radiocarbon determination	Calibrated date (yrs BP) 1 sd	Calibrated date (yrs BC/AD) 1 SD	Stratigraphic context	Material culture exotic (?) to site	Other	Source
Driel (DRL)	1775 ± 40 Pta-1381	1701–1595	AD 249–356	Layer 3 (Older Ash)	14 non-agriculturist potsherds	Mean thickness: 8.21 ± 1.8 mm	Maggs & Ward 1980; Mazel 1992 a, b
Shongweni (SHO)?	1770 ± 60 Pta-821	1708–1573	AD 242–377	Level 3	76 undiagnostic potsherds	Thickness: 8–17mm	Davies 1975
Sehonghong (SEH)	1710 ± 50 Pta-6063	1696–1525	AD 254–425	Base of layer GAP	52 non-agriculturist potsherds	Mean thickness: (8 ± 1.5 mm)	Mitchell 1996
Clarke's (CLK)	Undated layers but Continuously occupied between 2160 (layer 3) to 1580 (layer 2)	–	–	–	38 non-agriculturist potsherds	Mean thickness: ±8mm	Mazel 1984a, 1992a
Nkupe (NKP)?	Continuously occupied between 2000 BP and AD 1000	–	–	Layer 2	10 undiagnostic potsherds	Thickness: 5–15mm	Mazel 1988
kwaThwaleyakhe (KTK)?	Continuously occupied between 2640 (layer 4) to 1290 (layer 2)	–	–	Layer 3	37 non-agriculturist potsherds	Thickness: 7–8mm	Mazel 1993

TABLE 4

Forager and agriculturist sites that are dated to the period AD 350–650 and displayed on Figure 5. All the dated rock art is considered to be of forager authorship. A question mark indicates an uncertain association between a site's dates and the material of interest.

Site name	Radiocarbon determination	Calibrated date (yrs BP) 1 sd	Calibrated date (BC/AD) 1 sd	Stratigraphic context	Subsistence base of site occupants	Pottery type	Material culture exotic to site (?)	Source
Collingham (CLH)*	1810 ± 60 Pta-5265	1745–1591	AD 205–360	BSV 1	Foraging	Non-agriculturist	5 potsherds (5.88 mm)	Mazel 1992b
	1800 ± 50 Pta-5096	1724–1594	AD 227–356	BSV2	Foraging	Non-agriculturist	3 potsherds (5.88 mm), 2 copper beads	
	1770 ± 50 Pta-5274	1702–1588	AD 248–362	VP2	Foraging	Non-agriculturist	1 potsherd (5.88 mm), 1 iron bead	
Driel (DRL)*	1775 ± 40 Pta-1381	1701–1595	AD 249–356	Layer 3 (Older Ash)	Foraging	Non-agriculturist	14 potsherds (8.21 mm)	Maggs & Ward 1980; Mazel 1992a, 1992b
Shongweni (SHO)?*	1770 ± 60 Pta-821	1708–1573	AD 242–377	Level 3	Foraging	Undiagnostic	76 potsherds (8–17 mm)	Davies 1975
Sehonghong (SEH)	1710 ± 50 Pta-6063	1696–1525	AD 254–425	Base of layer GAP	Foraging	Non-agriculturist	52 potsherds (8 ± 1.5 mm)	Mitchell 1996
Mzonjani (MZ)	1670 ± 40 Pta-1980	1578–1434	AD 373–516	10–25 cm	Farming	*Mzonjani*	–	Maggs 1980
Enkwazini (ENK)	1650 ± 50 Pta-1847	1557–1426	AD 394–525	Layer 2 (Grid A364)	Farming	*Mzonjani*	–	Hall 1980
	1540 ± 60 Pta-1977	1430–1309	AD 520–641	Layer 2 (Grid A397)	Farming	*Mzonjani*	–	
Belleview (BEL)	1590 ± 55 Pta-291	1512–1375	AD 439–575	Layer 2	Foraging	–	–	Carter 1977
Clarke's (CLK)	1580 ± 50 Pta-2973	1508–1366	AD 443–584	Layer 2	Foraging	Non-agriculturist	38 potsherds (±8 mm)	Mazel 1984a, 1992a
Inanda Quarry (IQ)	1580 ± 50 Pta-5492	1508–1366	AD 443–584	Pit 3	Farming	*Mzonjani*	–	Whitelaw & Moon 1996
iNkolimahashi (NKM)	1580 ± 50 Pta-7230	1508–1366	AD 443–584	Layer 5	Foraging	Undiagnostic	15 potsherds	Mazel 1999

TABLE 4 (*continued*)

Forager and agriculturist sites that are dated to the period AD 350–650 and displayed on Figure 5. All the dated rock art is considered to be of forager authorship. A question mark indicates an uncertain association between a site's dates and the material of interest.

Site name	Radiocarbon determination	Calibrated date (yrs BP) 1 sd	Calibrated date (BC/AD) 1 sd	Stratigraphic context	Subsistence base of site occupants	Pottery type	Material culture exotic to site (?)	Source
2931CA174	1560 ± 50 Pta-7577	1472–1324	AD 479–626	Midden	Farming	*Mzonjani*	–	KwaZulu-Natal Museum database
Mbabane (MBB)	1520 ± 50 Pta-3678	1405–1311	AD 545–639	Layer 4	Foraging	*Msuluzi*	20 sherds of which 2 are *Msuluzi*, 3 pieces of iron, 1 piece of *Sorghum caffrorum*	Mazel 1986b
Wosi (WOS)	1460 ± 50 Pta-4100	1358–1289	AD 592–662	layer 3 Grid 2	Farming	*Msuluzi*	236 OES beads, worked bone (linkshafts and points), hornfels microlithic flakes	Van Schalkwyk 1994a
	1430 ± 60 Pta-4104	1355–1194	AD 595–757	layer 4 (Grid 2)				
Melikane (MEL)?	1440 ± 40 Pta-1364	1345–1277	AD 605–674	Layer 1	Foraging	Non-agriculturist?	23 pieces of undecorated pottery	Carter 1977; Hobart 2003
Nkupe (NKP)?	Undated layers but continuously occupied c. AD 1–1000.	–	–	Layer 2	Foraging	Undiagnostic	10 pieces of undecorated pottery (5–15 mm)	Mazel 1988
kwaThwaleyakhe (KTK)?	Undated layers but continuously occupied c. 2640 (layer 4) – 1290 BP (layer 2).	–	–	Layer 3	Foraging	Undiagnostic	37 sherds, mean thickness: 7.33 ± 1.93 mm; 5 land snail beads	Mazel 1993
Umhlatuzana (UTA)?	Undated, relative date by pottery	–	AD 400–800 (estimated based on pottery)	Layer 2	Foraging	*Msuluzi*	40 pieces of early agriculturist pottery of which 7 are decorated, 16 land snail beads	Kaplan 1990

TABLE 5

The earliest appearance of domestic livestock at agriculturist and forager sites. They are ordered chronologically.

Site Name	Layer	Radiocarbon determination (years b.p.)	Calibrated date (yrs BC/AD) 1 sd	Stratigraphic context	Sheep	Sheep/Goat	Goat	Cattle	Who occupied the site?	Source
					MNI (M)/NISP (N)					
Wosi (WOS)	layer 3 Grid 2	1460 ± 50 Pta-4100	AD 592–662	–	20 M 398 N	45 M 932 N	2 M 26 N	2 M 11 N	Agriculturists	Van Schalkwyk 1994a; Voigt & Peters 1994; Arnold 2008
	layer 4 Grid 2	1430 ± 60 Pta-4104	AD–595–757							
Mhlopeni (MLP)	Pit 1	1400 ± 50 Pta-2878	AD 636–765	–	3 M	1 M	–	–	Agriculturists	Maggs & Ward 1984; Voigt 1984
KwaGandaganda (KGG)	Square 25	1395 ± 60 Wits-1918	AD 639–765	–	175 N	823 N	9 N	63 N	Agriculturists	Whitelaw 1994
Mamba (MAM)	All	1390 ± 50 Pta-4093	AD 643–765	–	10 M 45 N	25 M 134 N	1 M 1 N	37 M 313 N	Agriculturists	Van Schalkwyk 1994b; Voigt & Peters 1994; Arnold 2008
		1300 ± 50 Pta-4114	AD 682–857							
Msuluzi Confluence (MS)	Pit E main horizon	1370 ± 30 Pta-2197	AD 654–763	–	4 M	4 M	–	2 M	Agriculturists	Maggs 1980b; Arnold 2008
		1310 ± 40 Pta-2195	AD 680–835							
Magogo (MAG)	Pit 1	1360 ± 50 Pta-2874	AD 659–765	–	9 M 30 N	4 M 359 N	6 M 13 N	4 M 5 N	Agriculturists	Maggs & Ward 1984; Voigt 1984; Arnold 2008
		1320 ± 50 Pta-3716	AD 675–839							
Likoaeng (LIK) (Lesotho)	layer 1	1285 ± 40 GrA–23237, AMS on sheep bone	AD 677–858	Securely dated	1 M	1 M	–	1 M	Foragers with stock	Mitchell et al. 2008
Wosi (WOS)	layer 2 Grid 2	1290 ± 50 Pta-4094	AD 685–858	–	80 M 974 N	258 M 3032 N	6 M 37 N	36 M 202 N	Agriculturists	Van Schalkwyk 1994a; Voigt & Peters 1994; Arnold 2008
	Pit 1 Grid 2	1270 ± 60 Pta-4095	AD 690–883							
Nanda (NAN)	–	1275 ± 60 Wits-1917	AD 690–880	–	Present	Present	Present	Present	Agriculturists	Whitelaw 1993; Plug 1993
KwaGandaganda (KGG)	Square 22	1245 ± 60 Wits–1919	AD 690–888	–	62 N	1225 N	22 N	599 N	Agriculturists	Whitelaw 1994

TABLE 5 (*continued*)

The earliest appearance of domestic livestock at agriculturist and forager sites. They are ordered chronologically.

Site Name	Layer	Radiocarbon determination (years b.p.)	Calibrated date (yrs BC/AD) 1 sd	Stratigraphic context	Sheep	Sheep/Goat	Goat	Cattle	Who occupied the site?	Source
					MNI (M)/NISP (N)					
Magogo (MAG)	–	Undated (between 1360 and 1190 b.p.)	–	–	3 M 8 N	13 M 80 N	2 M 2 N	2 M 12 N	Agriculturists	Maggs & Ward 1984; Voigt 1984; Arnold 2008
Ndondondwane (NDW)	Square G2 (50–60cm)	1220 ± 50 Pta-2388	AD 774–961	–	459 N	1458 N	47 N	960 N	Agriculturists	Maggs 1984; Voigt & Von den Driesch 1984; Arnold 2008
Magogo (MAG)	Pit 13b	1190 ± 50 Pta-2875	AD861–986	–	3 M 20 N	13 M 175 N	1 M 1 N	1 M 3 N	Agriculturists	Maggs & Ward 1984; Voigt 1984; Arnold 2008
Mamba (MAM)		1170 ± 60 Pta-4164	AD862–994	–	2 M 6 N	13 M 116 N	–	28 M 348 N	Agriculturists	Van Schalkwyk 1994b; Voigt & Peters 1994; Arnold 2008
Ntshekane (NTK)	Feature V	1100 ± 50 Pta-1057	AD 899–1028	–	20 M	–	–	14 M	Agriculturists	Maggs & Michael 1976
Pitsaneng (PIT)	Spit 3 to 7	960 ± 90 OxL-1314 (OSL date)	AD 950–1130	Domestic stock are grouped from Spit 7 to Spit 3 (420 ± 60 b.p.)	253 N	–	–	69 N	Foragers with stock	Hobart 2004
kwaThwaleyakhe (KTK)?	layer 1	undated	–	Derives from deposit associated with the last 1000 years.	1 M	–	–	–	Foragers	Mazel 1993; Plug 1993
Mzinyashana 1 (MZY)	layer 4	Undated	–	Between 1520 ± 20 b.p. (layer 5) and 970 ± 50 b.p. (layer 3)	1 M	–	–	1 M	Foragers	Mazel 1997; Plug 2002
	layer 3	970 ± 50 Pta 6538	AD 1043–1158	Disturbed deposit	1 M	1 M	–	1 M	Foragers	
	layer 1	660 ± 50 Pta-6715	AD 1306–1395	Securely dated	–	1 M	–	3 M	Agriculturists or foragers with stock?	

TABLE 6

Forager and agriculturist sites that are dated to the period AD 650–900 and displayed on Figure 6. A question mark indicates an uncertain association between a site's dates and the material of interest.

Site Name	Radiocarbon determination or other type	Calibrated date (yrs BP) 1 sd	Calibrated date (yrs BC/AD) 1 sd	Stratigraphic context	Subsistence base of site's occupants	Pottery type	Material culture exotic (?) to site	Source
Wosi (WOS)	1460 ± 50 Pta-4100	1358–1289	AD 592–662	layer 3 (Grid 2)	Farming	*Msuluzi*	236 OES beads, worked bone (linkshafts and points), hornfels microlithic flakes	Van Schalkwyk 1994a
	1430 ± 60 Pta-4104	1355–1194	AD 595–757	layer 4 (Grid 2)		*Msuluzi*		
	1290 ± 50 Pta-4095	1265–1092	AD 685–858	layer 2 (Grid 2)		*Ndondondwane*		
	1270 ± 60 Pta-4094	1260–1068	AD 690–883	Pit (Grid 1)		*Ndondondwane*		
Melikane (MEL)?	1440 ± 40 Pta-1364	1345–1277	AD 605–674	Layer 1	Foraging	Non-agriculturist?	23 pieces of undecorated pottery	Carter 1977; Hobart 2003
Mhlopeni (MLP)	1400 ± 50 Pta-2878	1314–1186	AD 636–765	Pit 1	Farming	*Msuluzi*	1 OES bead	Maggs & Ward 1984
KwaGandaganda (KGG)	1395 ± 60 Wits-1918	1311–1185	AD 639–765	Square 25	Farming	*Msuluzi*	390 OES beads	Whitelaw 1994
	1315 ± 60 Wits-1938	1274–1095	AD 676–856			*Msuluzi*		
	1260 ± 60 Wits-1919	1260–1062	AD 690–888	Square 22		*Ndondondwane*	50 OES beads	
	1260 ± 60 Wits-1937	1260–1062	AD 690–888	Square 14		*Ndondondwane*		

TABLE 6 (*continued*)

Forager and agriculturist sites that are dated to the period AD 650–900 and displayed on Figure 6. A question mark indicates an uncertain association between a site's dates and the material of interest.

Site Name	Radiocarbon determination or other type	Calibrated date (yrs BP) 1 sd	Calibrated date (yrs BC/AD) 1 sd	Stratigraphic context	Subsistence base of site's occupants	Pottery type	Material culture exotic (?) to site	Source
Mamba (MAM)	1390 ± 50 Pta-4093	1308–1186	AD 643–765	AII	Farming	*Msuluzi*	Bone link shafts	Van Schalkwyk 1994b
	1300 ± 50 Pta-4114	1269–1094	AD 682–857					
	1170 ± 60 Pta-4164	1089–956	AD 862–994	OVI		*Ndondondwane*	Hornfels flakes & broken bone points	
Msuluzi Confluence (MS)	1370 ± 30 Pta-2197	1296–1187	AD 654–763	Pit E (main horizon)	Farming	*Msuluzi*	3 OES beads, flaked stone implements, 2 bone implements, 1 spatulate object, talc schist	Maggs 1980b
	1310 ± 40 Pta-2195	1270–1115	AD 680–835					
Magogo (MAG)	1360 ± 50 Pta-2874	1292–1185	AD 659–765	Pit 1	Farming	*Msuluzi*	27 OES beads, worked bone points	Maggs & Ward 1984
	1320 ± 50 Pta-3716	1275–1112	AD 675–839					
Likoaeng (LIK)	1310 ± 80 Pta-7877	1273–1092	AD 677–858	Layer 1	Foraging to herding	79 sherds (either forager (Mitchell et al. 2008) or agriculturist (Whitelaw 2015)), 1 *Ndondondwane* sherd	80 *Ndondonwane* sherds? (See Whitelaw 2015) (cf. Mitchell et al. 2008)	Mitchell et al. 2008; Whitelaw 2015
	1290 ± 30 GrA-26831	1264–1094	AD 686–857					
	1285 ± 40 GrA-23237 (AMS on sheep bone)	1261–1092	AD 690–859					
2930DB43	1300 ± 50 Pta-4303	1269–1094	AD 682–857	Pit 1	Farming	*Msuluzi*	–	Whitelaw & Moon 1996

TABLE 6 (*continued*)

Forager and agriculturist sites that are dated to the period AD 650–900 and displayed on Figure 6. A question mark indicates an uncertain association between a site's dates and the material of interest.

Site Name	Radiocarbon determination or other type	Calibrated date (yrs BP) 1 sd	Calibrated date (yrs BC/AD) 1 sd	Stratigraphic context	Subsistence base of site's occupants	Pottery type	Material culture exotic (?) to site	Source
kwaThwaleyakhe (KTK)	1290 ± 50 Pta-5350	1265–1092	AD 685–858	Layer 2	Foraging	*Ntshekane*	56 pieces of pottery with three decorated *Ntshekane* phase pieces, 133 pieces of iron, 2 pieces of slag, 4 modified bovid tali (divining bones), 29 land snail beads	Mazel 1993
Gehle (GEL)	1280 ± 50 Pta-3242	1259–1074	AD 691–876	Layer 1	Foraging	undiagnostic	12 pieces of pottery, 1 piece of heavily corroded iron	Mazel 1984a
Nanda (NAN)	1275 ± 60 Wits-1917	1260–1070	AD 690–880	-	Farming	*Msuluzi*	10 OES beads	Whitelaw 1993
Emberton Way (EW)	1270 ± 60 Pta-2881	1260–1068	AD 690–883	Layer 3–4	Farming	*Msuluzi*	1 OES bead	Horwitz et al. 1991
	1130 ± 40 Pta-2880	1054–937	AD 897–1014	Layer 2		*Msuluzi/ Ndondondwane*		
Collingham (CLH)	1260 ± 50 Pta-5408	1257–1063	AD 694–888	TBS	Foraging	Non-agriculturist	9 potsherds, mean thickness: 7.94 ± 2.53 mm	Mazel 1992a
Sehonghong (SEH)	1240 ± 50 Pta-8064	1182–1003	AD 769–948	GAP	Foraging	Non-agriculturist	52 potsherds	Mitchell 1996
Ndondondwane (NDW)	1220 ± 50 Pta-2588	1177–989	AD 774–961	Square G2 (50–60 cm)	Farming	*Ndondondwane*	56 OES beads, LSA arrowpoints	Maggs 1984
	1190 ± 50 Pta-2389	1090–964	AD 861–986	Square 110 (40–50 cm)				

TABLE 6 (*continued*)

Forager and agriculturist sites that are dated to the period AD 650–900 and displayed on Figure 6. A question mark indicates an uncertain association between a site's dates and the material of interest.

Site Name	Radiocarbon determination or other type	Calibrated date (yrs BP) 1 sd	Calibrated date (yrs BC/AD) 1 sd	Stratigraphic context	Subsistence base of site's occupants	Pottery type	Material culture exotic (?) to site	Source
iNkolimahashi (NKM)	1170 ± 50 Pta-7229	1065–964	AD 886–987	Layer 4	Foraging	Early agriculturist/ undiagnostic	19 pieces of pottery with one decorated sherd	Mazel 1999
Shongweni (SHO)?	1170 ± 50 Pta-1059	1065–964	AD 886–987	Level 1b	Foraging	undiagnostic	Total at site: 76 potsherds, decorated sherds present but no count provided.	Davies 1975
Umbeli Belli (UMB)	1140 ± 50 Pta-2825	1058–957	AD 893–994	Layer 2AL	Foraging	Early agriculturist/ undiagnostic	726 potsherds (19 decorated), 1 land snail bead, 2 heavily corroded fragments of iron	Cable 1984
Mhlanga Lagoon (ML)	1080 ± 70 Pta-3268	1053–816	AD 898–1135	Midden	Farming	*Msuluzi/ Ndondondwane/ Ntshekane*	–	Horwitz et al. 1991
Sikhanyisweni (SKW)?	Undated but most likely corresponds with Gehle Shelter dates	–	–	Layer 1	Foraging	agriculturist	8 pieces of agriculturist pottery, 2 pieces of iron	Mazel 1988
Umhlatuzana (UTA)?	Undated, relative date by pottery	–	AD 400–800	Layer 2	Foraging	*Msuluzi*	40 potsherds (of which 7 are decorated), land snail beads	Kaplan 1990

TABLE 7

Forager and agriculturist sites that are dated to the period AD 900–1200 and displayed on Figure 7. A question mark indicates an uncertain association between a site's dates and the material of interest.

Site Name	Radiocarbon determination or other type	Calibrated date (yrs BP) 1 sd	Calibrated date (yrs BC/AD) 1 sd	Stratigraphic context	Subsistence base of site's occupants	Pottery type	Material culture exotic to site	Source
Sehonghong (SEH)*	1240 ± 50 Pta-8064	1182–1003	AD 769–948	GAP	Foraging	non-agriculturist	52 pottery pieces	Mitchell 1996
Ndondondwane (NDW)*	1190 ± 50 Pta-2389	1090–964	AD 861–986	Square 110 (40–50 cm)	Farming	*Ndondondwane*	56 OES beads, LSA arrowpoints	Maggs 1984
Magogo (MAG)*	1190 ± 50 Pta-2875	1090–964	AD 861–986	Pit 13b	Farming	*Ndondondwane*	27 OES beads, worked bone points	Maggs & Ward 1984
Mamba (MAM)*	1170 ± 60 Pta-4164	1089–956	AD 862–994	OVI	Farming	*Ndondondwane*	Hornfels flakes, broken bone points	Van Schalkwyk 1994b
iNkolimahashi Shelter*(NKM)	1170 ± 50 Pta-7229	1065–964	AD 886–987	Layer 4	Foraging	Agriculturist/ undiagnostic	19 pieces of pottery with one decorated sherd	Mazel 1999
Shongweni (SHO)?*	1170 ± 50 Pta-1059	1065–964	AD 886–987	Level 1b	Foraging	Undiagnostic	76 potsherds at site, decoration present (no count provided)	Davies 1975
Umbeli Belli (UMB)*	1140 ± 50 Pta-2825	1058–957	AD 893–994	Layer 2AL	Foraging	Early agriculturist/ undiagnostic	726 potsherds (19 decorated) 1 land snail bead, 2 heavily corroded iron fragments	Cable 1984
Emberton Way (EW)	1130 ± 40 Pta-2880	1054–937	AD 897–1014	Layer 2	Farming	*Msuluzi/ Ndondondwane*	1 OES bead	Horwitz et al. 1991
	1050 ± 60 Pta-2879	963–805	AD 988–1145			*Msuluzi/ Ndondondwane/ Ntshekane*		
Ntshekane (NTK)	1100 ± 50 Pta-1057	1057–923	AD 899–1028	Feature V (Pit)	Farming	*Ntshekane*	Pieces of unworked OES, flaked stone artefacts	Maggs & Michael 1976
Mhlanga Lagoon (ML)	1080 ± 70 Pta-3268	1053–816	AD 898–1135	Midden	Farming	*Msuluzi/ Ndondondwane/ Ntshekane*	–	Horwitz et al. 1991
KwaGandaganda (KGG)	1080 ± 60 Wits-1920	1051–820	AD 900–1130	Square 14	Farming	*Ndondondwane/ Ntshekane*	8 OES beads	Whitelaw 1994

TABLE 7 (*continued*)

Forager and agriculturist sites that are dated to the period AD 900–1200 and displayed on Figure 7. A question mark indicates an uncertain association between a site's dates and the material of interest.

Site Name	Radiocarbon determination or other type	Calibrated date (yrs BP) 1 sd	Calibrated date (yrs BC/AD) 1 sd	Stratigraphic context	Subsistence base of site's occupants	Pottery type	Material culture exotic to site	Source
Barne's (BRN)	1060 ± 65 OZD 446	991–805	AD 979–1146	Crust covering paint	Foraging	–	This is dated rock art	Mazel & Watchman 2003
Belleview (BEL)	1030 ± 50 Pta-449	935–805	AD 1016–1146	Layer 1	Foraging	Undiagnostic	17 potsherds	Carter 1977
Mpambonyoni (MPB)	980 ± 50 Pta-2527	909–799	AD 1042–1152	Midden A	Farming	*Blackburn*	–	Robey 1980
	930 ± 50 Pta-2528	903–733	AD 1048–1217	Midden B				
	885 ± 50 Pta-2534	794–686	AD 1157–1264	Midden A				
Mzinyashana 1 (MZY)	970 ± 50 Pta-6538	908–792	AD 1043–1158	Layer 3	Foraging/ farming	Undiagnostic	259 potsherds, 1 piece of slag, 1 land snail bead, 1 sweat scraper	Mazel 1997
Pitsaneng (PIT)	960 ± 90 OxL-1314 (OSL dating)	870–1050	AD 950–1130	Spit 7	Foraging to herding	Non-agriculturist	64 'coarse Bushmanware' 96 % grit-tempered	Hobart 2003, 2004
Bolahla (BOL)	910 ± 45 Pta-5549	897–726	AD 1053–1225	Spit 3-5	Foraging	Non-agriculturist	44 pieces of pottery	Mitchell et al. 1994
Blackburn (BLN)	900 ± 40 Pta-162	798–724	AD 1152–1226	Pit F	Farming	*Blackburn*	–	Davies 1971
kwaThwaleyakhe (KTK)	Undated, estimated to postdate AD 1000	–	–	Layer 1	Foraging	*Ntshekane*	9 Ntshekane potsherds, 6 pieces of iron,1 piece of slag, a modified sheep tali	Mazel 1993
Driel (DRL)	Undated, estimated AD 1000	–	–	Layer YA and UO	Foraging	Undiagnostic	119 pieces of pottery, 1 cane glass bead, 1 piece of iron, 1 iron awl, land snail beads, *Sorghum caffrorum*	Maggs & Ward 1980; Mazel 1988

TABLE 8

Forager and agriculturist sites that are dated to the period AD 1200–1500 and displayed on Figure 8.

Site Name	Radiocarbon determination or other type	Calibrated date (yrs BP) 1 sd	Calibrated date (yrs BC/AD) 1 sd	Stratigraphic context	Subsistence base of site's occupants	Pottery type	Material culture exotic (?) to site	Source
Mpambonyoni (MPB)	930 ± 50 Pta-2528	903–733	AD 1048–1217	Midden B	Farming	*Blackburn*	–	Robey 1980
	885 ± 50 Pta-2534	794–686	AD 1157–1264	Midden A				
Bolahla (BOL)	910 ± 45 Pta-5549	897–726	AD 1053–1225	Spit 3-5	Foraging	Non-agriculturist	44 potsherds	Mitchell et al. 1994
Blackburn (BLN)	900 ± 40 Pta-162	798–724	AD 1152–1226	Pit F	Farming	*Blackburn*	–	Davies 1971
Mgede (MGD)	820 ± 50 Pta-3665	732–670	AD 1219–1280	Layer 2	Foraging	Undiagnostic	63 pieces of pottery, 1 cane glass bead, 1 rusted piece of iron	Mazel 1986a
Belleview (BEL)	815 ± 35 Pta-448	722–675	AD 1229–1275	Layer X	Foraging	Undiagnostic	5 potsherds	Carter 1977
Mzinyashana 1 (MZY)	790 ± 50 Pta-6541	725–660	AD 1225–1291	Layer 2	Farming	*Moor Park*	253 pieces of pottery associated with later agriculturist sites Moor Park and Mpambanyoni (4 decorated pieces found in layers 1 and 2).	Mazel 1997
	660 ± 50 Pta-6715	644–555	AD 1306–1395	Layer 1			117 pieces of pottery associated with later agriculturist sites Moor Park and Mpambanyoni (4 decorated pieces found in layers 1 and 2), 3 ceramic figurine fragments (1 cattle horn, 1 stylised female figurine and 1 unidentified)	

TABLE 8 (*continued*)
Forager and agriculturist sites that are dated to the period AD 1200–1500 and displayed on Figure 8.

Site Name	Radiocarbon determination or other type	Calibrated date (yrs BP) 1 sd	Calibrated date (yrs BC/AD) 1 sd	Stratigraphic context	Subsistence base of site's occupants	Pottery type	Material culture exotic (?) to site	Source
Moor Park (MP)	750 ± 50 Pta-849	683–568	AD 1267–1383	Terrace H	Farming	*Moor Park*	–	Davies 1974
	660 ± 50 Pta-850	644–555	AD 1306–1395	Terrace A				
	600 ± 50 Pta 853	629–522	AD 1321–1428	Terrace E				
Gehle (GEL)	750 ± 50 Pta-3243	683–568	AD 1267–1383	Layer 1	Foraging	Undiagnostic	12 pieces of pottery, 1 piece of heavily corroded iron	Mazel 1984a
Shongweni (SHO)?	730 ± 60 Pta-1060	676–565	AD 1275–1386	Pit H4	Foraging	Agriculturist	Sorghum, 6 decorated sherds	Davies 1975
Sewula Gorge (SG)	710 ± 50 Pta-8370	665–565	AD 1285–1386	Trench 1	Farming	*Moor Park*	–	Huffman 2007
	660 ± 50 Pta-8372	644–555	AD 1306–1395					
Collingham (CLH)	650 ± 50 Pta-5092	642–551	AD 1309–1400	Layer TBS	Foraging	Non-agriculturist	13 potsherds, mean thickness: 7.94 ± 2.53 mm	Mazel 1992a
Ntomdadlana (NDL)	630 ± 50 Pta-8697	635–540	AD 1315–1410	Trench 3	Farming	*Moor Park*	–	Huffman 2007
Mhlwazini (MWZ)	580 ± 50 Pta-4864	624–512	AD 1327–1439	Layer 4	Foraging	Undiagnostic	15 pieces of pottery	Mazel 1990
iNkolimahashi (NKM)	550 ± 45 Pta-7459	547–509	AD 1404–1441	layer 3	Mixed occupation	Undiagnostic /agriculturist?	34 pieces of pottery with two decorated sherds	Mazel 1999
Mbabane (MBB)	500 ± 50 Pta-3684	541–488	AD 1409–1463	Layer 3	Foraging	Undiagnostic	77 pieces of pottery, 2 pieces of slag, 9 pieces of *Sorghum caffrorum*	Mazel 1986b
	470 ± 40 Pta-3848	520–464	AD 1430–1487					
iGujwana (GUJ)	390 ± 50 Pta-8101	488–327	AD 1463–1623	Trench 1	Farming	*Moor Park*	–	Huffman 2007
Esikolweni (EKW)	330 ± 90 OZB 127U	486–284	AD 1464–1667	Plant fibre in paint	Foraging	–	Dated rock art	Mazel & Watchman 1997
Nkupe (NKP)	Undated, within last 900 years	–	–	Layer 2	Foraging	Undiagnostic	10 pieces of pottery (undecorated), 1 cane glass bead	Mazel 1988
				Layer 1	Foraging	Undiagnostic	2 pieces of pottery	Mazel 1988

Chapter 6: A southern African archaeological database of organic containers and materials, 800 cal BC to cal AD 1500: Possible implications for the transition from foraging to livestock-keeping.

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Supporting information provided in Appendix 4.

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RESEARCH ARTICLE

A southern African archaeological database of organic containers and materials, 800 cal BC to cal AD 1500: Possible implications for the transition from foraging to livestock-keeping

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Abstract

Although evidence of organic materials has consistently been reported in the archaeology of southern Africa little attention has been given to how this evidence, so slight in comparison to pottery and lithics, might be used to understand the transition from foraging to livestock-keeping in southern African Archaeology. We have compiled a geo-referenced, radiocarbon database of these organic, material culture remains, with particular reference to containers made of ostrich eggshell, wood, gourd, tortoise shell, twine, and leather over a 2300-year period to capture the periods before and after the appearance of livestock. We have mapped the organic materials for the period 800 cal BC to cal AD 1500 and explored the subsistence base of those who used them. This distribution is compared to that of pottery and livestock remains–conventionally the two archaeological markers of pastoralists. The paper interrogates what this might add to the vexed question of how the practice of livestock-keeping and pottery-making spread into and through the region (the hunter-herder debate). Our analysis suggests that ostrich eggshell containers can be used as a proxy for hunter-gatherers. By comparing areas of bead *manufacture* with those that have evidence only of bead *use*, we show the areas to which items may have travelled, along already established hunter-gatherer exchange networks. Our results suggest that hunter-gatherers widely and quickly adopted pottery across southern Africa in a process of cultural diffusion and local innovation, and that this was possibly the main mechanism for the dispersal of livestock at 2100 years ago.

Introduction

One of the key transitions in human history is from foraging to food production. In southern Africa, the subsistence base of the autochthonous people was one of hunting and gathering until approximately 2100–2300 years ago. The first appearance of domestic plants, animals

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and pottery is linked to two spread events. The first was of livestock without cultivation to the drier western half of southern Africa. Sites with livestock have proved to be difficult to distinguish from those without livestock because both have a similar archaeological "Later Stone Age" signature of stone tools, some pottery, a large wild faunal assemblage, low numbers of livestock and ostrich eggshell beads. The second, slightly later and less controversial spread is that of agro-pastoralist, metal-working ('Iron Age') Bantu-language speaking farmers into the eastern summer rainfall area. The higher archaeological visibility of these farmer sites (highly decorated thick-walled pottery, hut floors, and iron working) makes it easier to distinguish them from those of hunter-gatherers.

In southern Africa, the 'hunter-herder' debate is about whether the spread of novel traits was associated with the migration of people (demic diffusion) [1–15] or by local innovation or their adoption by hunters and gatherers (cultural diffusion) [16–31]. The paper is situated within this debate.

We use the contrasting categories 'cultural/demic' and 'hunter/herder' as useful heuristic devices [32]. It is widely appreciated that these are not strictly bounded categories. Herder is used to describe the practice of keeping livestock (whilst retaining a hunter-gatherer worldview and subsistence base [31, 33–35]–we prefer the term livestock-keeper for this category). Hunter-gatherer, farmer and pastoralist are used to describe the worldview that accompanies hunting and gathering, sedentary agro-pastoralism and livestock-ownership respectively [36, 37]. The prevailing consensus is that the spread of novel traits throughout southern Africa was by immigration, imitation and innovation [36, 37, 38]. How to distinguish these in the archaeological record remains unclear [39–41].

We start from the premise that the spatio-temporal distribution of organic containers might carry information on the mode of subsistence of their users. Although the southern African ethnographic and historic record is rich in accounts of the use of containers made from a variety of organic raw material by farmers, pastoralists and hunter-gatherers, the archaeological evidence of such use has not previously been considered in the debate (Figs 1–3).

Our interest was piqued by Sadr and Sampson's [43] suggestion of a similarity between the earliest thin-walled pottery as found at a number of sites in southern Africa from approximately 2300 years ago [43–46] and ostrich eggshell containers: "Indeed, given some of the vessel forms in the earliest ceramic levels of Die Kelders (Schweitzer 1979: figs. 25 and 28), we wonder whether the thin-walled pots were not initially meant to imitate ostrich eggshell containers" [43:246]. Although not explicit, their interpretation favours potting as a local innovation amongst hunter-gatherers, since ostrich eggshell containers are conventionally interpreted as a hunter-gatherer item [47–50]. We were curious as to what the motivation for such imitation might be, and whether imitation of function necessarily follows form [cf. 51:192]. We subsequently looked for evidence of the use of ostrich eggshell containers by both southern African pastoralists and farmers and of the co-occurrence in time and space of ostrich eggshell containers and early pottery.

We assembled and mapped geo-referenced archaeological data relating to organic container manufacture and/or use for the period 800 cal BC to cal AD 1500 alongside archaeological data on the occurrence of livestock and pottery (without cultivation). We also included ostrich eggshell beads.

The presence in southern Africa of prehistoric exchange networks amongst some hunter-gatherer groups has been established [52–55]. Ostrich eggshell beads, for example, may have been exchanged over some distance [52–55]. In an effort to understand what the archaeological distributions of material items might mean, we also captured the spatio-temporal data for the occurrence of ostrich eggshell beads in order to compare it to that of ostrich eggshell



Fig 1. Examples of ethnographically recorded organic containers: Six containers made from tortoise shell and one from bone, Central Kalahari from Ghanzi farm Bushmen, Botswana 1973 (Unaccessioned, Russell and Russell Kalahari Collection, University of the Witwatersrand, South Africa) [42].

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containers. We expected ostrich eggshell containers, an item that is not commonly exchanged, to have a restricted distribution whereas beads, the most exchanged item, as recorded ethnographically, would travel more widely [cf. 53, 56, 57]. Where possible we compared the availability of particular raw materials with the archaeological distribution of an associated item.

In compiling the databases we were driven by the following questions:

1. What is the spatio-temporal distribution of organic containers in southern African archaeology for this period and what are its implications? Which type of container is the oldest?
2. Are particular types of container associated with particular modes of subsistence (typically characterised as hunter-gatherers, farmers or pastoralists)?

3. How does the distribution of organic containers compare to that of thin-walled pottery and of livestock?
4. Do ostrich eggshell beads and ostrich eggshell containers have the same spatio-temporal distribution?
5. Is there an environmental limitation to the distribution of ostrich eggshell and gourd (*Lagenaria sp*.) containers?

Materials

The paper presents two geo-referenced databases. The first database captures organic, archaeological material recovered from Later Stone Age sites that may have been used in container manufacture, namely, ostrich eggshell, tortoise shell, wood, twine, gourd and leather (Database 1, S1 Appendix). In addition, data on the occurrence of ostrich eggshell beads, pottery and livestock, from non-agriculturist contexts only, have been included. It excludes all data from agro-pastoralist (farmer) sites (associated with the first use of iron and speakers of Bantu-languages), with the exception of pottery related to farmers at Later Stone Age sites. The second database presents written accounts of the use of organic containers among Khoesan and Bantu-language speaking groups as recorded since the 16th century (S1 Appendix).

Database 1: Southern African archaeological organic database, 800 cal BC-cal AD 1500

Database 1 provides an inventory of the six types of organic remains recovered from the southern African Later Stone Age context from cal 891 BC to cal AD1512 (for ease of reference and because of the lack of precision in radiocarbon dates, we refer to this as 800 cal BC to cal AD



Fig 2. Examples of ethnographically recorded organic containers: A leather bag made by Ghanzi farm Bushmen, Botswana, 1973 (Unaccessioned, Russell and Russell Kalahari Collection, University of the Witwatersrand, South Africa) [42].

https://doi.org/10.1371/journal.pone.0235226.g002



Fig 3. Examples of ethnographically recorded organic containers: A decorated ostrich eggshell made by Ghanzi farm Bushmen, Botswana, 1973 (Unaccessioned, Russell and Russell Kalahari Collection, University of the Witwatersrand, South Africa) [42].

https://doi.org/10.1371/journal.pone.0235226.g003

1500 in the headings) (S1 Map). The geographic scope includes regions between latitudes 17 to 34 degrees south and between longitudes 11 to 33 degrees east. This includes coverage of Namibia, Botswana, Zimbabwe, South Africa, Lesotho and the Kingdom of Eswatini (formerly Swaziland). We excluded Zambia because of the limited reporting/research and/or the absence of organic remains from sites in Zambia for the period in which we are interested. We could find no evidence of ostrich eggshell containers although there are sites with ostrich eggshell beads [58–62].

For purposes of discussion within the hunter-herder debate, the database also contains radiocarbon-dated and geo-referenced data from all known occurrences of Later Stone Age pottery, livestock and ostrich eggshell beads for the same period.

Database 2: Southern African historical database of organic container use, 16th century onwards

Database 2 presents the spatio-temporal distribution of organic container use amongst extant and historical Khoesan populations, as well as Bantu-language speaking agro-pastoralists, as derived from ethnographic and historic accounts ranging in date from the 16th century AD to the present.

Methods

The maps were made using ArcGIS version 10.5. The base map was built using the freely available 4.01 Biomes in Africa Map and a more detailed vector geospatial vegetation/biome dataset for South Africa, Lesotho and Swaziland from the South African National Biodiversity Institute.

Compilation of the southern African archaeological organic database, 800 cal BC- cal AD 1500 (Database 1)

This database was collated from multiple sources, namely, site excavation reports, academic publications, unpublished dissertations and radiocarbon laboratory lists (S1 Table). Key texts

were [63] for Later Stone Age sites, and [64] for sites related to the spread of livestock keeping. The database contains the following fields:

1. A unique site reference number.
2. The official site name as designated by the excavator(s).
3. The type of site (open or shelter, coastal or inland).
4. Country and/or province location.
5. Geographic co-ordinates.
6. The subsistence base of the site's occupants.
7. Stratigraphic context of radiocarbon date and/or material remains.
8. Uncalibrated radiocarbon date and laboratory number. Direct dates are highlighted in bold alongside the material dated.
9. Calibrated date ranges. Dates were calibrated using Oxcal version 4.3. All materials were calibrated using the Southern Hemisphere Calibration Curve ShCal 13 [65]. Dates derived from uncorrected and uncalibrated marine shell are calibrated using Marine13 [66]. The mean marine carbon reservoir correction (ΔR) is taken [67], with a weighted mean of 146 ±85 for the western coast of southern Africa (this applies only to the coastal regions of Namaqualand in the Northern Cape and the Western Cape Province). For the southern coast of South Africa, including the coastal regions between Mossel Bay and Port Elizabeth, the mean marine carbon reservoir correction (ΔR) is taken, with weighted mean ΔR of 187 ±18 [68]. All calibrations are to one sigma and reported as calibrated years cal BC/cal AD. A reservoir correction is not used for dates derived from ostrich eggshell, since they are fossilised and thus old (Higham pers comm. 2019).
10. Radiocarbon dates were given a rating:
    1. Good. A direct date.
    2. Fair. Sequence of dates with good stratigraphic control and the excavator is confident in the association between dates and material remain(s).
    3. Poor. Date derives from poor stratigraphic contexts or there is only a single date obtained for a site.

The sites are grouped temporally into four 600-year time slices:

1. Group 1: 891–291 cal BC.
2. Group 2: 290 cal BC- cal AD 310.
3. Group 3: cal AD 311–911.
4. Group 4: cal AD 912–1512.

These four 600-year time slices capture patterns that have been identified previously [25, 28, 38, 42, 64, 69]–an early first millennium AD appearance of livestock and ceramics (Groups 2 and 3) and a later first millennium to second millennium AD appearance of lugged ware, livestock and large ostrich eggshell bead diameters associated with Khoe pastoralists (Group 4). Each map has an accompanying table (arranged as separate sheets in S1 Appendix) showing the finer chronology of the material culture for each time slice.

The reporting style of published excavated material assemblages is uneven. Gaps occur particularly in the reporting of the quantity, size and presence or absence of the manufacture of ostrich eggshell beads. Where individual counts of material items could not be established for each stratigraphic level, total counts at a site are reported. The database was filtered to remove sites with no clear association between stratigraphic context and dates, or which fell outside of the geographic scope of the database collection–e.g. northern Mozambique where sites lie above 17 degree latitude. A total of 49 sites and 98 radiocarbon dates were thus excluded from the database (S1 Appendix). Post-filtering, the database comprises 187 sites, associated with 489 radiocarbon dates. Of these 77 sites contain organic remains (S1 Appendix).

For ease of reference and because there are so few organic remains, the finds in Database 1 are condensed into five categories:

1. Category 1: Later Stone Age pottery (type of temper).
2. Category 2: Ostrich eggshell containers (mouth/rim fragments and/or decorated pieces).
3. Category 3: All other organic remains, namely leather, twine, gourd (*Lagenaria sp.*), wood or tortoise carapace.
4. Category 4: Livestock.
5. Category 5: Ostrich eggshell beads–quantity, and presence or absence of manufacture (this was based on the presence of unfinished beads).

On the maps, these categories are reflected in a symbol (Fig 4). The size of the symbol reflects the number of ostrich eggshell beads recovered at a site. Ostrich eggshell was captured

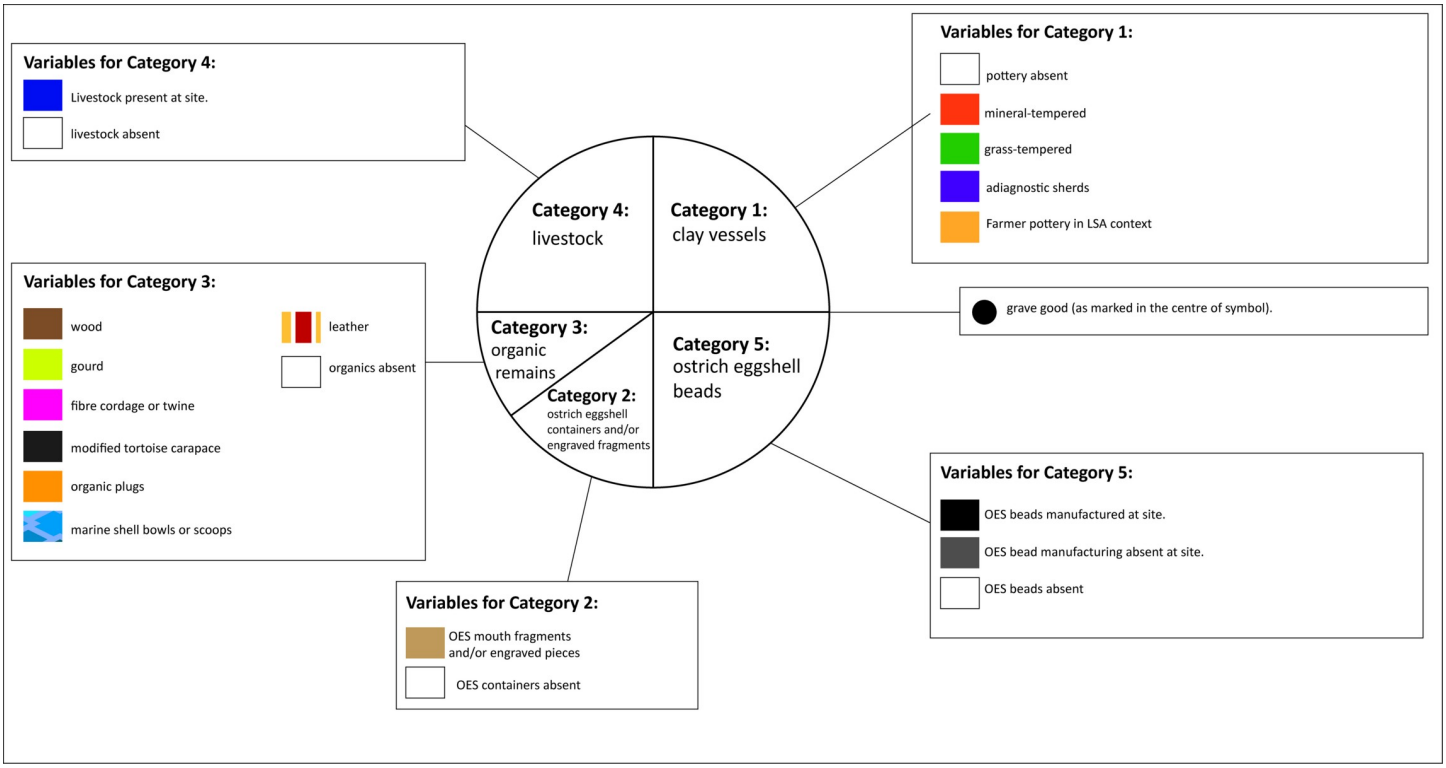

Fig 4. The symbol used to display the five categories of archaeological material found at a site.

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as a container only if it showed either, (a) evidence of modification in the form of a mouth or rim piece, or (b) an engraved or painted pattern. The capturing of tortoise carapace was based on whether or not it was described as 'modified' by the excavator. The quantities of other items of material culture at each site are recorded in Database 1. Those sites with a poor temporal rating (3) have a symbol with a 60% transparency setting on the maps for easy identification.

For simple comparison with containers made from organic materials, we took the decision to make a single category of Later Stone Age pottery (category 1) and to look at one of its variables (temper) and to simply consider its presence or absence at a site. All the pottery in this category is thin-walled (5–8 mm) and found exclusively at sites of herders, pastoralists and hunter-gatherers [69]. There are regional subsets to this group that differ in terms of their shape and decoration (For example, in the southwestern Cape [21, 28, 70, 71], the South African interior [42, 72, 73]; south-eastern southern Africa [43, 45, 74]; northern Cape, South Africa [75], Eastern Cape, South Africa [76], Namibia [18], Free-State, South Africa [77], Zimbabwe and Botswana [3, 78–80]. These subsets are not considered here.

To document the types of engraving observed on ostrich eggshell fragments and to confirm the presence of ostrich eggshell rim pieces and other organic material from the excavated record, a sample of six sites were selected for further documentation by visiting the museum collections in South Africa (S2 Table). The six sites were chosen because they have evidence of organic containers and pottery (mineral and grass tempered) (S2 Appendix, S3 Appendix, S4 Appendix).

Compilation of the southern African historical database of organic container use, 16th century onwards (Database 2)

This *non-exhaustive* geo-referenced database comprises 89 entries from historical and ethnographic sources for the use of organic containers amongst non-agro-pastoralist and agro-pastoralist groups in southern Africa (S1 Appendix, S3 Table). References to the use of non-agro-pastoralist mineral- and grass-tempered pottery were also recorded. The database has a date range from 1593 AD to the present (S1 Appendix).

Database 2 contains the following fields:

1. A unique site reference number.
2. Name of record taker.
3. Documentation type (e.g. traveller account, museum object or photographic collection etc.).
4. Date of record.
5. Cultural group.
6. Mode of subsistence.
7. Region and country of record.
8. The area from which geographic co-ordinates were taken for mapping. Geographic co-ordinates are estimates: none of the accounts provided latitude and longitude information.
9. Geographic co-ordinates.
10. Container type recorded.
11. Container function.

12. Other information (e.g. plant species, where provided).
13. Verbatim record.
14. Reference/source.

Ethnographic sources

Six ethnographic works were consulted. Five of these are records made among Khoe- and non-Khoe-speaking Bushmen groups between 1950 and 1993 [56, 81–84]. They cover a geographic region that extends from the Nyae Nyae Conservancy in north-eastern Namibia to Ghanzi, in Botswana. The sixth source is Hoernlé's ethnographic study of the Nama of Walvis Bay, Namibia (1912 and 1923) [85].

Historical sources

Two online museum archives were accessed: 1. The Oswin Köhler Archive from the Goethe University, Frankfurt (https://www.uni-frankfurt.de/62970506/Collection_Oswin_Köhler). A simple search was carried out by object type or cultural group name between 1911 and 1996. 2. The Pitt Rivers Museum collection (https://www.prm.ox.ac.uk/collections-online). Search parameters included the photographic collections, Africa continent, southern Africa and 'Khoisan' cultural group.

The following research publications were consulted: (1). Bollong et al. [86] provides a review of early colonial traveller and settler accounts for the use of pottery amongst historically observed Khoe pastoralist groups and Bushmen occupying the drier interior and south-western coastal regions of South Africa. (2). Rudner [87] offers additional historical references for the use of pottery amongst non-ago-pastoralist groups. (3). Sydow [88] references the use of organic containers by historically documented Khoe pastoralists, (4). Guenther [84] describes container use amongst the Namib Bushmen, Namibia. (5). Shaw and van Warmelo [89] record the use of baskets, gourds, calabashes and wooden containers amongst Bantu language-speaking agro-pastoralists in the Eastern Cape, South Africa. (6). Hooper [90] records containers used by the Zulu and Swazi of KwaZulu-Natal, South Africa and Eswatini (formerly Swaziland) respectively.

The geographic coordinates in Database 2 are approximate, based on maps where provided, and the geographic region as described in each source. A map was compiled by overlaying point data (each symbol refers to a historic or ethnographic account) onto the freely available UNEP Africa average annual precipitation (mm) map (UNEP, 2002 http://geodata.grid.unep.ch).

Results

Each of the four maps should be read in conjunction with the accompanying spreadsheet (Figs 5–8, S1 Appendix). Key patterns observed for the four time slices are summarised below (Table 1).

Map 1, 891–291 cal BC

Fifty-three (53) archaeological sites fall within this period (Fig 5). The organic materials present are ostrich eggshell (beads at 48 sites, containers at 8 sites), fibre/twine (6 sites of which 4 are graves) and leather (1 grave site). Five sites contain no evidence of ostrich eggshell beads, four of which are gravesites (this concurs with the observation amongst hunter-gatherers of the Kalahari that all possessions with the exception of beadwork are taken to a person's grave

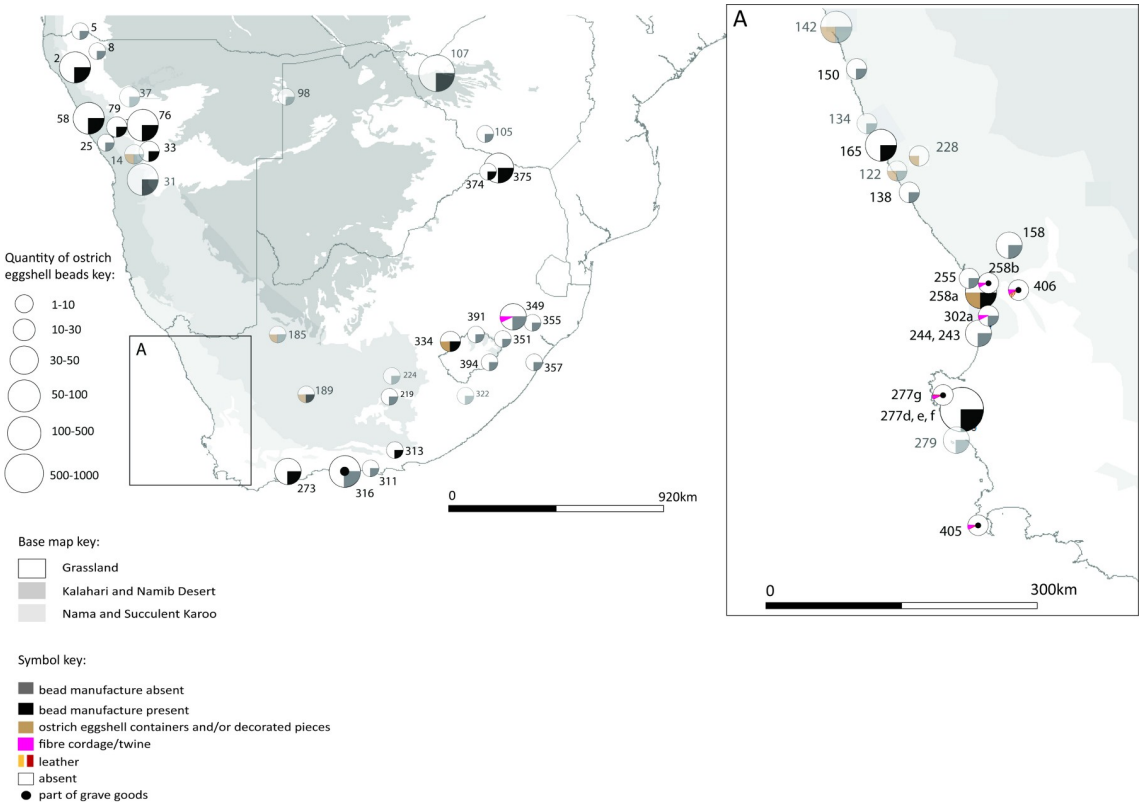

Fig 5. Map 1 showing the distribution of organic finds in the period 891–291 cal BC.

https://doi.org/10.1371/journal.pone.0235226.g005

on death [82:41]) and one is a scatter site. There is no evidence for pottery or livestock during this time slice.

Map 2, 290 cal BC- cal AD 310

Sixty-three (63) sites fall within this time slice (Fig 6). The organic materials recorded are ostrich eggshell (55 sites with beads, 17 sites with containers), fibre/twine (10 sites, of which 2 are graves), leather (3 sites, of which 1 is a grave), tortoise containers (6 sites), gourd (3 sites), wood (2 sites), and modified marine shell (1 site). Eight sites have no evidence of ostrich eggshell beads. 36 sites contain mineral-tempered pottery; of these sites, 12 also contain ostrich eggshell containers. Five sites contain fibre-tempered pottery–but with no evidence of ostrich eggshell containers, and with very little evidence of ostrich eggshell beads (2 of the sites have less than ten beads each). No fibre-tempered pottery is found with livestock. Five sites have ostrich eggshell containers without pottery. One of these is a grave, three are coastal middens and one is a small coastal rock shelter. All ten sites containing livestock have pottery and beads (all but one of them are bead manufacture sites). Six of the sites with livestock have ostrich eggshell containers (of which four are decorated; one may have been used to store ground ochre) (site 167, Ai Tomas [91: 214]). There is no evidence of bead manufacture at sites in the southern eastern parts of South Africa. Gourds are found only on the eastern side of South Africa.

Map 3, cal AD 311–911

Seventy-six (76) archaeological sites fall within this period (Fig 7). The organic material recorded is ostrich eggshell (beads at 61 sites, containers at 18 sites), fibre/twine (12 sites),

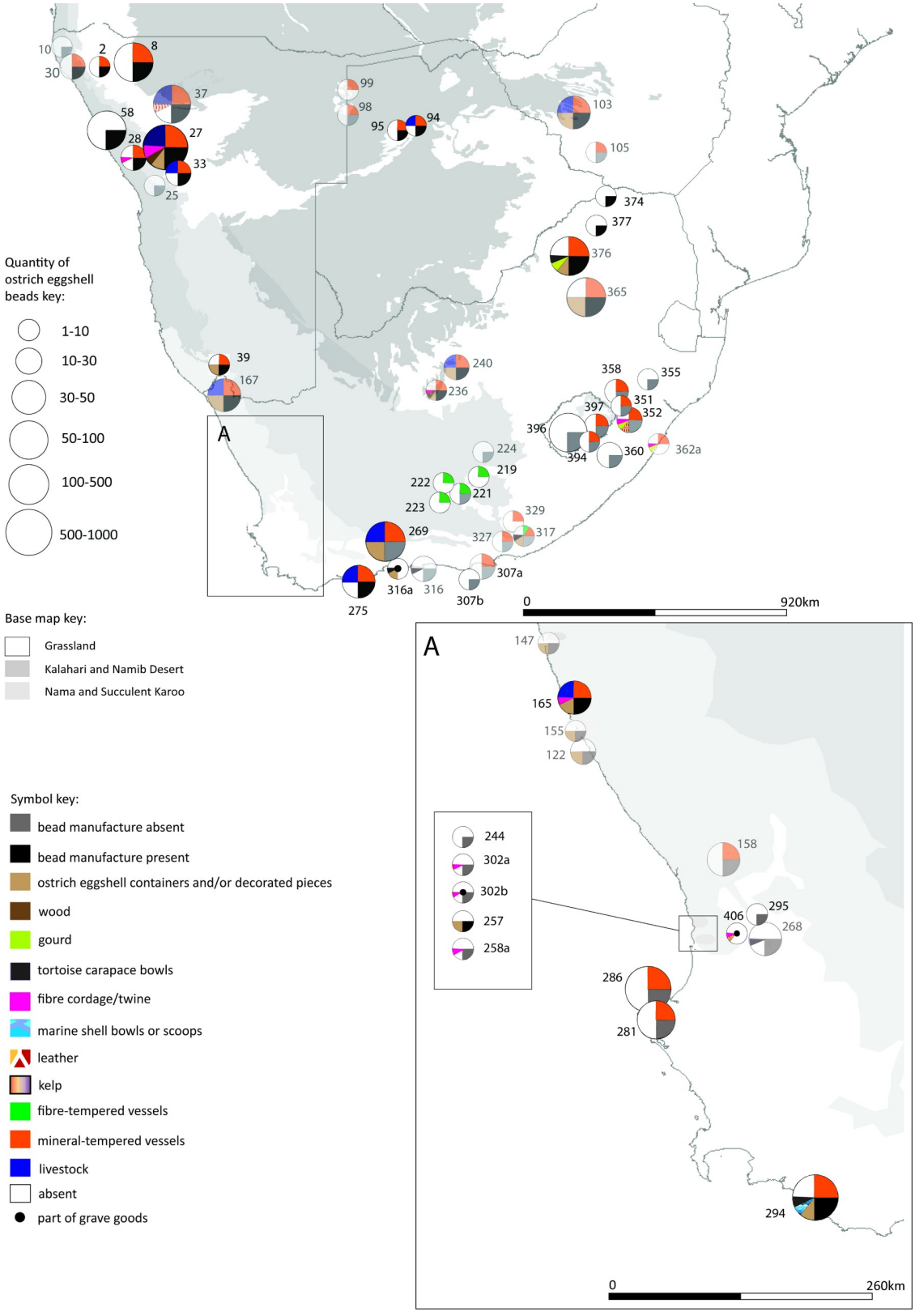

Fig 6. Map 2 showing the distribution of organic finds, livestock and pottery in the period 290 cal BC- cal AD 310.

https://doi.org/10.1371/journal.pone.0235226.g006

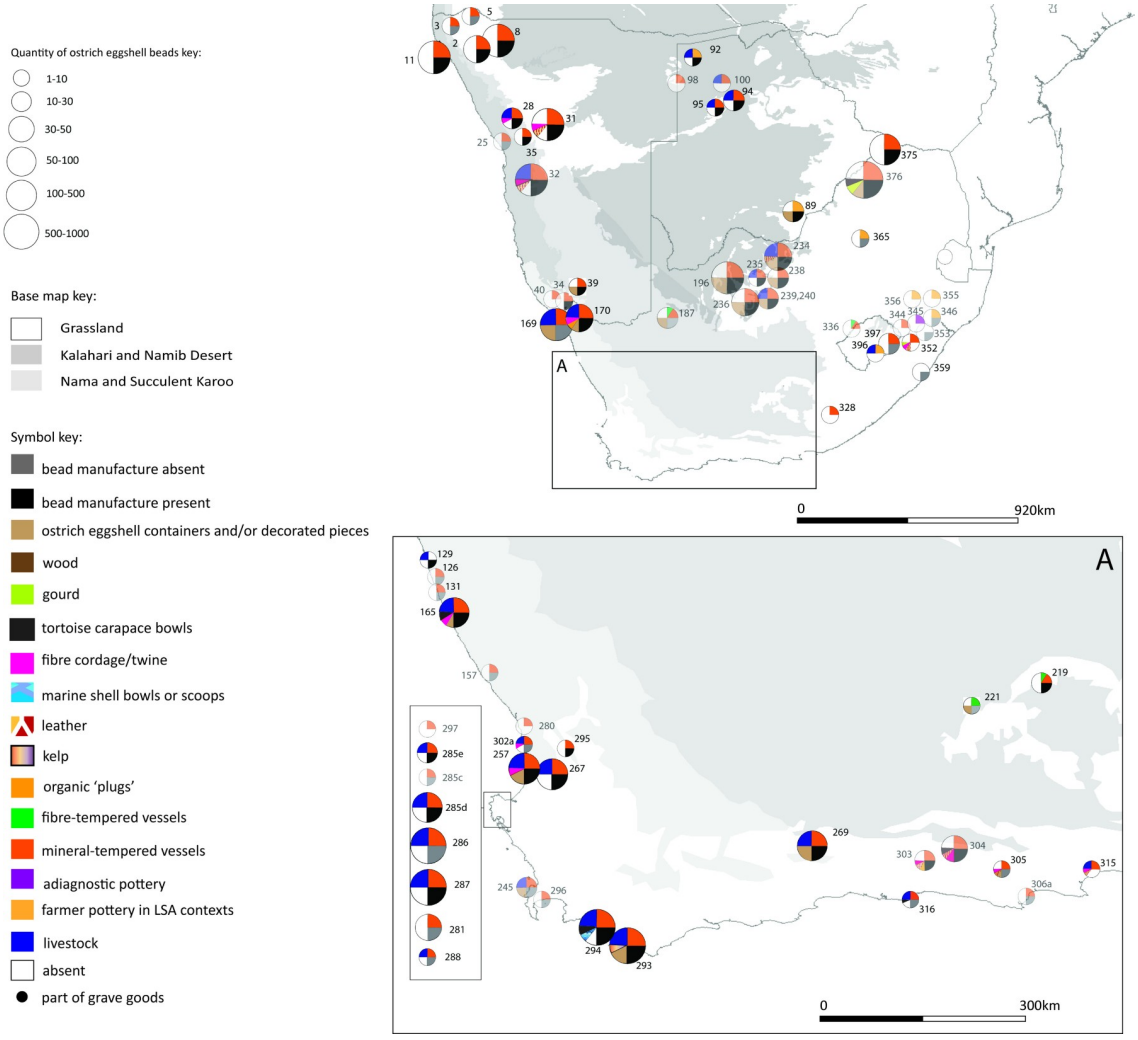

Fig 7. Map 3 showing the distribution of organic finds, livestock and pottery in the period cal AD 311–911.

https://doi.org/10.1371/journal.pone.0235226.g007

leather (8 sites), tortoise carapace (4 sites), gourd (2 sites), organic plugs (2 sites), kelp (1 site) and marine shell (1 site). Thirteen (13) sites have no evidence of ostrich eggshell beads. 61 sites have mineral-tempered pottery, of these 15 sites also contain ostrich eggshell containers. Four sites have fibre-tempered pottery, 2 of these have ostrich eggshell containers. Fibre-tempered pottery is not found with livestock. Seven sites have agro-pastoralist (farmer) pottery in a Later Stone Age context. There are 28 sites with livestock, of these 25 also have pottery and beads (all but four of these are bead manufacture sites). Eight of the sites with livestock have ostrich egg-shell containers. There is no evidence of bead manufacture in KwaZulu-Natal. Gourds are found in the eastern half of southern Africa. Fibre- and mineral-tempered ware are found together at sites for the first time (4 sites only, all without livestock).

Map 4, cal AD 912–1512

Ninety-two (92) sites are recorded in this period (Fig 8). The organic material recorded is ostrich eggshell bead (64 sites), ostrich eggshell containers (25 sites), fibre/twine (13 sites),

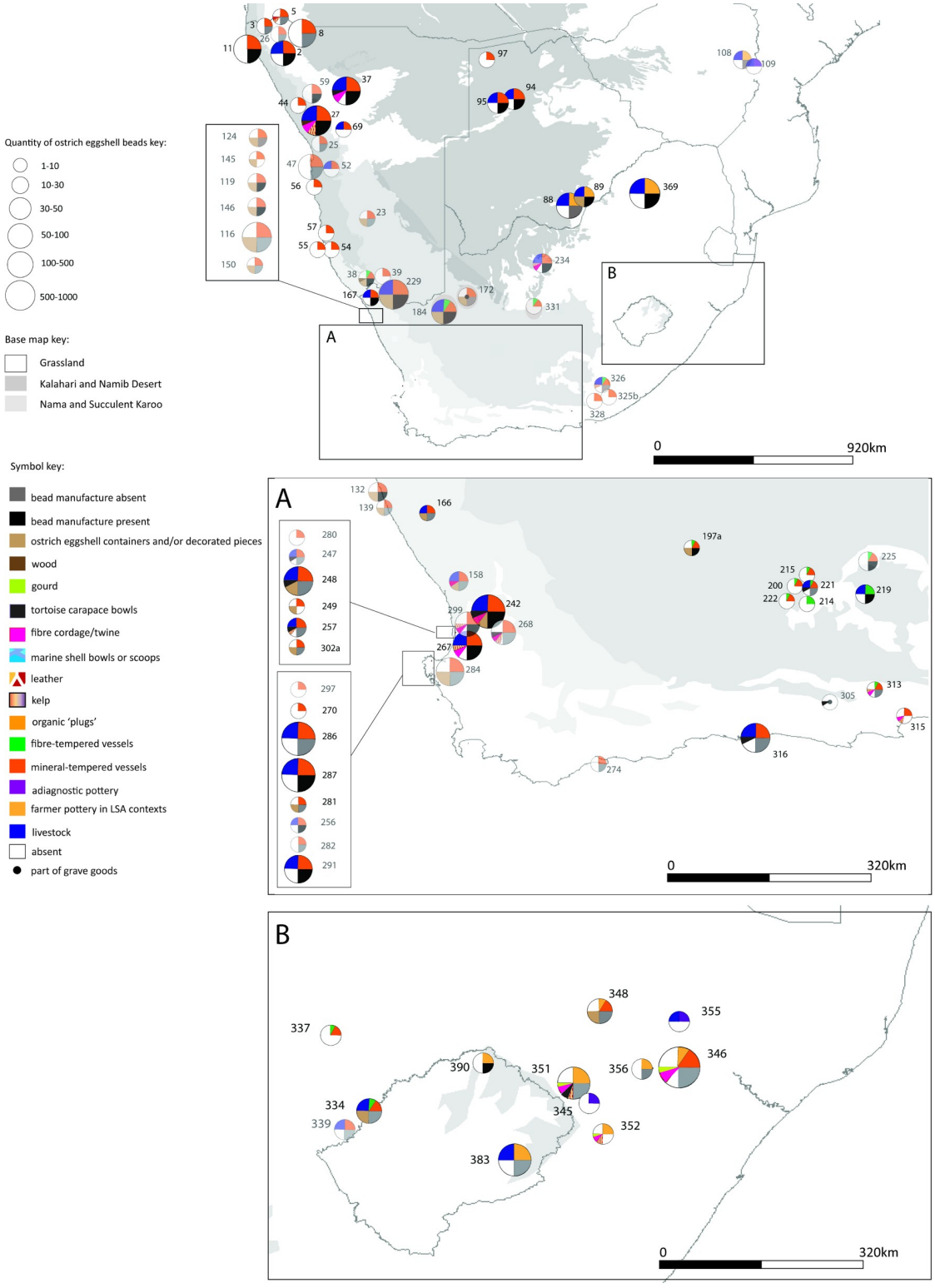

Fig 8. Map 4 showing the distribution of organic finds, livestock and pottery in the period cal AD 912–1512.

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Table 1. Table showing the occurrence and co-occurrence of archaeological items during each of the four time periods.

Archaeological item	Map 1 (53 sites), 891 -291BC	Map 2 (63 sites) 290 BC- 310 AD	Map 3 (76 sites) AD 311–911	Map 4 (92 sites), AD 912–1512
Ostrich eggshell containers	**8**	**17**	**18**	**25**
Pottery	**0**	**36 mineral-tempered**	**61 mineral-tempered**	**72 mineral-tempered**
		5 fibre-tempered	**4 fibre-tempered**	**15 fibre-tempered**
Livestock	0	10	28	35
Livestock + bead manufacture	0	9	19	15
Livestock + mineral-tempered pottery	0	10	25	28
Livestock + all types of pottery	0	10	27	35
Sites with beads	48	55	61	64
Sites without beads	5	8	13	26
Mineral-tempered pottery + ostrich eggshell containers	0	12	15	22
Fibre-tempered pottery + ostrich eggshell containers	0	0	2	4
Fibre-tempered pottery + livestock	0	0	0	5
Fibre-tempered pottery + mineral-tempered pottery	0	1	3	13
Ostrich eggshell containers + no pottery	8	5	0	0
Livestock + ostrich eggshell containers	0	6	8	7
No ostrich eggshell containers and no pottery	45	21	3	1
Livestock + no ostrich eggshell beads	0	0	2	4
Livestock + no ostrich eggshell containers	0	4	19	25

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leather (12 sites), tortoise carapace (10 sites), gourd (3 sites) and wood (2 sites). Twenty-six (26) sites have no evidence of ostrich eggshell beads. Seventy-two (72) sites have mineral-tempered pottery, 22 of which also have ostrich eggshell containers. Fifteen (15) sites have fibre-tempered pottery, 4 of which also have ostrich eggshell containers. For the first time fibre-tempered pottery is found with livestock (4 sites), at all of these sites the fibre-tempered pottery is found with mineral-tempered pottery. Two sites contain fibre-tempered pottery only. Eleven (11) sites have agro-pastoralist (farmer) pottery in a Later Stone Age Context. Thirty-five (35) sites have livestock, of these 33 have pottery as well as beads (17 of these have evidence of bead manufacture). Seven sites with livestock have ostrich eggshell containers. There is no evidence of bead manufacture in KwaZulu-Natal. Gourds are only found in the eastern portion of South Africa.

Ethnographic and historic observations of container use from AD 1600 onwards

Mistakes are likely to have been made in assigning identity to people encountered on the southern African landscape during the historic period [92]. The map showing the ethnographic/historic use of organic and pottery vessels largely coincides with what is understood from the archaeology: (1) Fibre-tempered pottery was identified only among hunter-gatherers; (2) Both hunter-gatherers and pastoralists used mineral-tempered vessels; (3) Gourds were used by both Bantu-language speakers and some pastoralists. The distribution of gourd use is concentrated in the summer rainfall area of southern Africa; and (4) Ostrich eggshell container use is almost exclusively by hunter-gatherers (Fig 9).

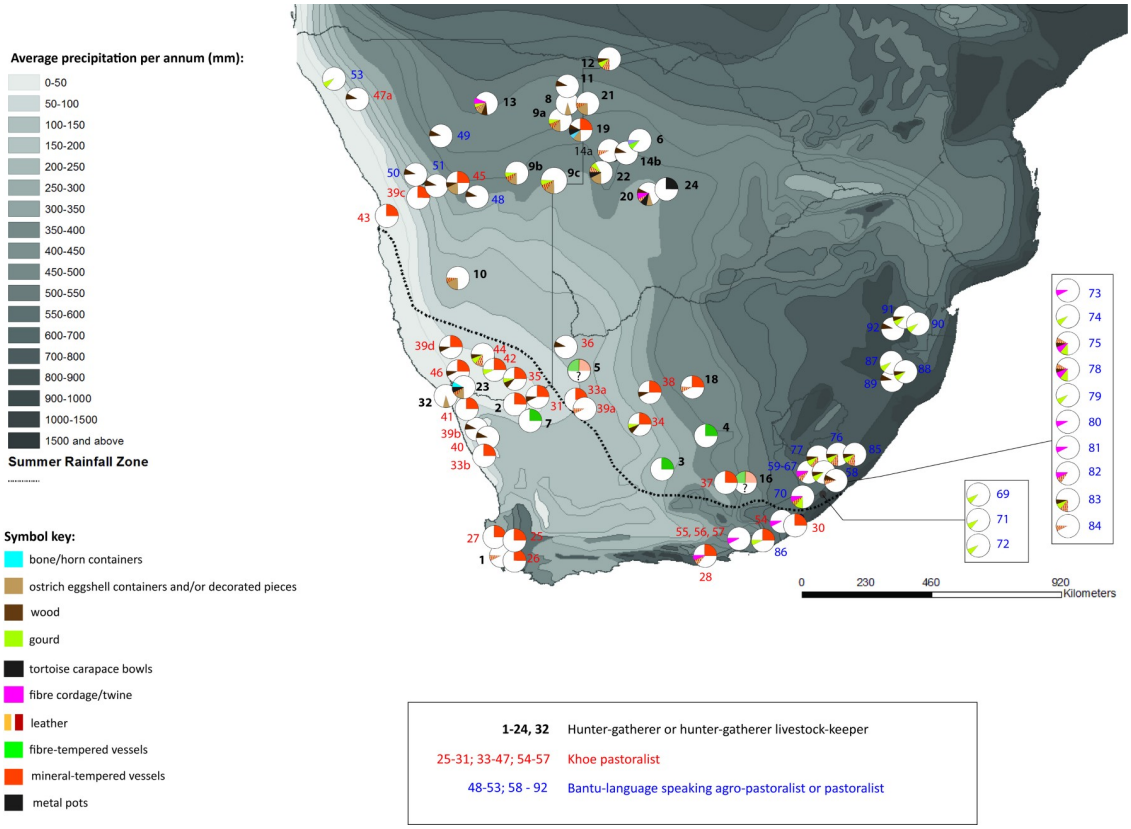

Fig 9. Map to show the ethnographic and historic observations of container use from AD 1600 onwards.

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Discussion

Discussion of leather and plant fibre/twine evidence is limited due to their poor preservation, low numbers, and the impossibility of knowing whether they were used for bags, containers, nets or some other function. The numbers of marine and tortoise containers were likewise low. Our discussion focuses on ostrich eggshell containers which are well-preserved and found in relatively high numbers. We turn first to the questions posed at the start of the paper.

(i). What is the spatio-temporal distribution of organic containers in southern African archaeology for the study period and what are its implications? Which type of container is the oldest?

Organic containers made of ostrich eggshell are found throughout the time-period but with spatial clustering. They are found in their highest numbers along the west coast of South Africa. They are very rare in Namibia, and the southeastern part of South Africa where gourds are found. Evidence of plant fibre and leather is concentrated at gravesites during the period 891–291 cal BC, possibly a consequence of the better preservation in these microenvironments. Later they are found at living sites. Containers made from other materials such as marine and tortoise shell, wood and gourd are found in low numbers from 290 cal BC onwards. Ostrich eggshell containers predate the introduction of pottery. On the available evidence, this is the oldest preserved type of container in southern Africa.

(ii). Are particular types of container associated with particular modes of subsistence (typically characterized as hunter-gatherers, farmers or pastoralists)?

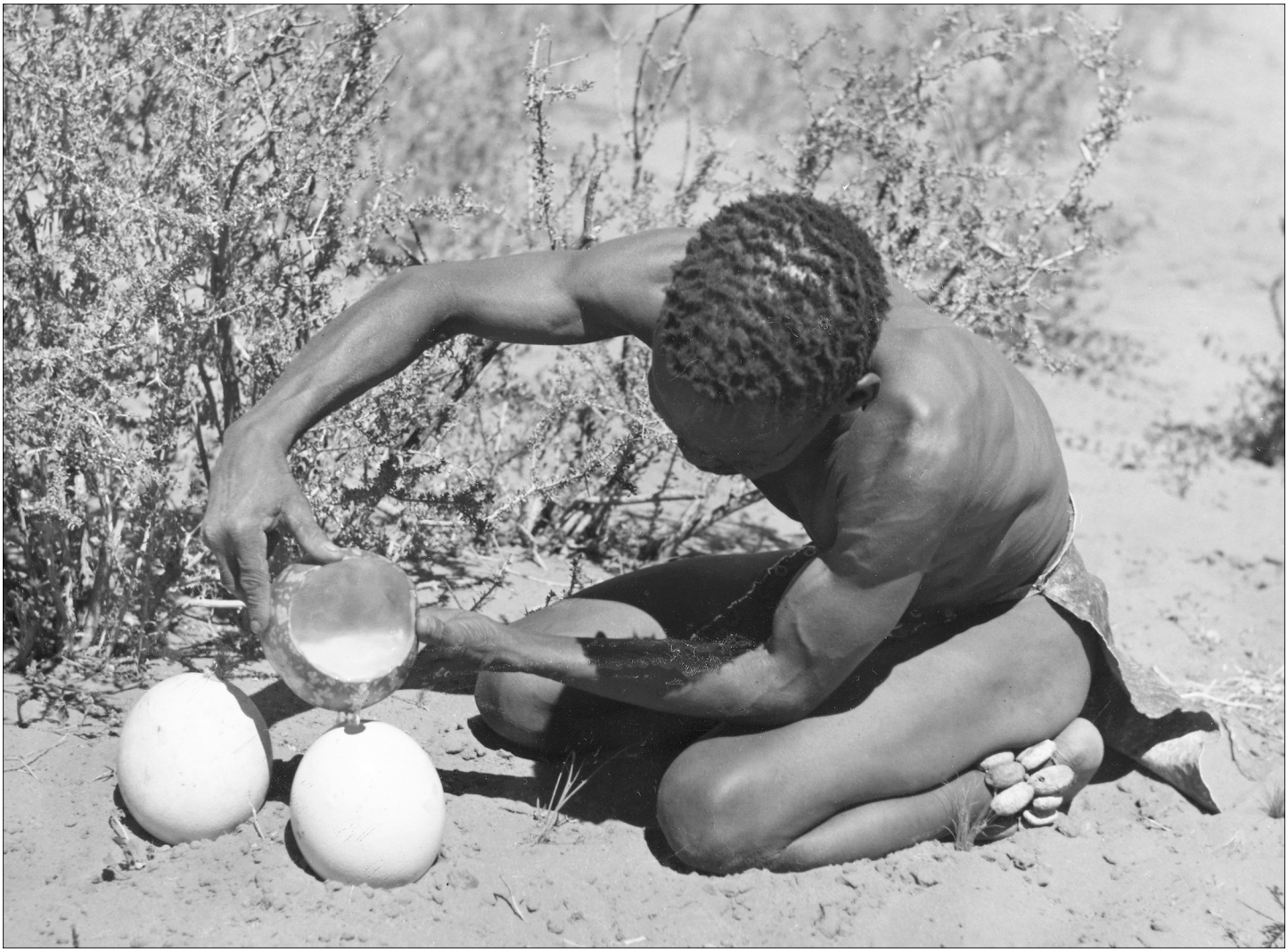

Fig 10. Man filling ostrich eggshells with water for storage, 1945–50, Southern Africa. Copyright Pitt Rivers Museum, University of Oxford (1998.193.33).

https://doi.org/10.1371/journal.pone.0235226.g010

Archaeological remains of decorated and undecorated ostrich eggshell containers in hunter-gatherer contexts in southern Africa date back to 60 000 years ago, firmly establishing them as a hunter-gatherer item ahead of the arrival of farming and pastoralism [49, 93–99]. The historic and ethnographic record shows that they were used for carrying and storing water (amongst the G/wi of the central Kalahari, Botswana [82: 221],! Kung of northern Botswana [81: 122]; southern African Bushmen [100: 143],! Kung of Nyae Nyae, Namibia [56: 77], and the Kalahari Bushmen [101: 28]) (see also [85, 86, 88]) (Fig 10). Two historic records by European travellers of the use of ostrich eggshell water containers by hunter-gathers are noted by [88: 24], by Hans Schinz (1884/1887) of the Kalahari Bushmen and by J.H. Wilhelm of the! Kung Bushmen. We came across only one historic record of this use among southern African pastoralists–Vedder's observation in 1938 of Nama in Namibia with pottery, wooden milk buckets and ostrich eggshells for water containers [88:30]. No ethnographic accounts were found of their use by either southern African pastoralists or agro-pastoralists. Ostrich eggshell beads, however, are common among all three subsistence groups [102]. We discovered only a handful of ethnographic and historic accounts of the use of ostrich eggshells

among African farmers or pastoralists outside of southern Africa (on Konso homestead rooftops in Ethiopia [103], as a symbolic household ornament associated with marriage and fertility among Somali and Tuareg pastoralists [50] and as a cooking fat container by the Ingessa (Gaam), Sudan) [104].

We were interested in why, and if, these portable and durable water containers remained an exclusively hunter-gatherer item after the arrival of food production. There is some evidence in the Later Stone Age southern African archaeology that they were used to store materials other than water (ochre [91, 105–107], specularite [93, 108] and ostrich eggshell pieces [109]). Overwhelmingly they are documented as containers for water -"water flasks" [48, 49,100, 110, 111].

They are used on foraging trips, to bring water back to camp and to store water in times of plenty. Buried caches of as many as 'several hundred' have been recorded among the G/wi in Botswana for use in the dry season [81] (see also [82, 112]). Marshall [56: 5] notes of the! Kung of Nyae Nyae Namibia, "They took ostrich eggshells filled with water and stayed gathering for two or three days, and returned to /Gam when their shells were empty". They are items that are personally owned and sometimes engraved to mark ownership [49, 56, 81].

It is in their use as water containers that an argument can be built as to why ostrich eggshells are not a pastoralist or an agro-pastoralist item: they are too small. The capacity of an ostrich eggshell is about 1 litre [56, 81].! Kung families had 8 to 10 eggshell containers each [56]. They are portable and durable, but have the disadvantage of being heavy (about 0.5 kg when empty) [56]. The alternative is to use animal bladders or stomachs which are less popular than ostrich eggshells as they tear easily [81]. They are not suitable as water containers for households with livestock. Young livestock, which must remain at the homestead, require daily watering. Leather water bags of 15 litre capacity are required to meet the needs of people and very young animals at the camps of pastoralists in Niger [113: 1] and amongst the Tuareg of West Africa, where:

> ". . .the exact placement of the camp. . . is determined by the water requirements of the young animals which remain inside the camps, as well as those of the people themselves. Lambs, kids and humans do not require great quantities of water (sufficient amounts can be carried in leather water bags for two days' supply) but since calves drink more they must be taken directly to the water source every day" [114: 85].

It has been estimated that the daily waters requirement of cattle is 30 to 60 litres per head per day, and that for sheep and goats is 3 to 15 litres [115]. These figures go up in hot weather [115]. These high demands of livestock for daily watering means that pastoralists must live close to water [85, 113, 114, 116]. When the household requirements cannot be met at the water source, gourds and leather bags are used for carrying water [117]. The use of livestock as draught animals means that larger quantities of water can be carried back to the homestead [113]. Grillo [118] working among the Samburu pastoralists records their use of livestock stomach bags for fetching household water and also the use of larger leather pouches in which several gourds could be carried at once. "Most pastoralist Samburu women would tell me that they never stored water at all, and if they did it would be in wooden containers, gourds, or woven containers. . ." [118:135]. Amongst Somali pastoralists, the average water container made from plant material has a capacity of 30 to 34 litres and is used for fetching and storage [50].

The evidence suggests that in southern Africa, ostrich eggshell containers were a *hunter-gatherer* item. Unlike beads, they were not a regular part of symbolic exchange networks (cf. [119]).

The spatio-temporal mapping shows that pottery is common from its first appearance in southern Africa, approximately 2300 years ago. Its co-occurrence with ostrich eggshell containers at Later Stone Ages sites shows a widespread uptake from its first introduction (cf. [42, 69]). Once pottery arrived in southern Africa, it rapidly became a ubiquitous item at hunter-gatherer sites suggesting that is offered an immediate adaptive advantage to hunter-gatherers. What that was, is impossible to say without residue analysis of potsherds [120–125]. It seems likely that ostrich eggshells were used for water storage and that pottery was used for boiling and rendering. We can postulate that food would have been mainly roasted but not boiled prior to the introduction of pottery. An alternative way of boiling has been recorded–stone boiling, where heated stones are placed within containers made from woven grass, wood or leather [118]. In the later 18th century eastern Cape, Khoe pastoralists are observed using this method, "They boil the food in water in skin bags with stones heated to glowing point" [88: 18]. Pottery would have improved the diet because fat and nutrients, captured by pottery, are lost when roasting on a fire. Pottery would have also allowed the rendering and storage of fat, which would have prolonged its edibility during the hot summer months [126] (cf. [125, 127, 128]). We do not know whether hunter-gatherers were making pottery, although this is very likely [42, 125].

(iii). How does the distribution of organic containers compare to that of thin-walled pottery, and with livestock?

From 290 cal BC when pottery first appears in the record, most sites with evidence of ostrich eggshell containers also have evidence of pottery (12 sites with co-occurrence, 5 sites with ostrich eggshell containers only). Towards the eastern interior and coastal region of South Africa, where there is no ostrich eggshell container use, pottery is found at most sites, sometimes with evidence of gourds. These patterns persist to AD 1512.

From the earliest appearance of livestock at approximately 2100 years BP, there is the co-occurrence of livestock remains with ostrich eggshell containers (6 of the 10 sites with livestock also have ostrich eggshell containers). Organic finds other than ostrich eggshell are low at livestock bearing sites: leather at 1 site, wood at 1 site, fibre at 2 sites. Sites in Botswana and Namibia with evidence of livestock have evidence of leather and twine but no ostrich eggshell containers. From 912 AD, when livestock sites are at a peak, very few also have evidence of ostrich eggshell containers. Leather and fibre/twine are more common at these livestock sites from 912 AD, but the numbers of organic remains are low.

(iv). Do ostrich eggshell beads and ostrich eggshell containers have the same spatio-temporal distribution? And (v) Is there an environmental limitation on ostrich eggshell and gourd container distribution?

Unlike ostrich eggshell containers, which are found only in the areas with a viable habitat for ostriches, ostrich eggshell beads are found beyond their natural habitat. This confirms the suggestions made previously [53, 129].

While ostrich eggshell beads are found at most Later Stone Age sites, evidence of bead manufacture is rarer. Sites in the southeastern part of South Africa have almost no evidence of bead manufacture. For the period 290 cal BC to cal AD 310, sites with livestock are overwhelmingly also sites of bead manufacture. In subsequent periods, this pattern is not sustained.

Ostrich eggshell containers are absent from sites in eastern southernmost Africa, and from northern Botswana. They are rare in northern Namibia. They are found in greatest concentration on South Africa's western coastal strip. Gourds (*Lagenaria sp*.) are found only within the summer rainfall area of southern Africa, which is their preferred habitat [130].

Table 2. Sites that potentially represent pastoralist presence in southern Africa in the given time periods.

Site Reference Number	Site name, region and country	Cultural Affiliation as identified by excavator/past research.	Map Number
94	**Toteng 1** North West Botswana	Hunter-gatherers with access to trade networks with Bantu-language speaking farmers or Hunter-gatherers with livestock and Bambata pottery.	2 (290 BC–AD 310)
37	**Geduld** Kunene Namibia	Hunters on the periphery of pastoralist groups.	2 (290 BC–AD 310)
33	**Leopard Cave** Erongo Namibia	unknown [LSA groups]	2 (290 BC–AD 310)
275	**Blombos Cave** southern Cape coast South Africa	Herder	2 290 BC–AD 310)
28	**Snake Rock** Erongo Namibia	Hunter-gatherer stock-keepers	3 (AD 311–911)
32	**Miribib Shelter** Erongo Namibia	unspecified LSA groups	3 (AD 311–911)
100	**Lotshitshi** North West Botswana	LSA with pottery and cattle	3 (AD 311–911)
95	**Toteng 3** North West Botswana	Hunter-gatherers with access to trade networks with Bantu-language speaking farmers or Hunter-gatherers-livestock-keepers with Bambata pottery	3 (AD 311–911)
94	**Toteng 1** North West Botswana	Hunter-gatherers with access to trade networks with Bantu-language speaking farmers or Hunter-gatherers with livestock and Bambata pottery.	3 (AD 311–911)
235	**Blinkklipkop [BKK]** Northern Cape South Africa	Pastoralist [Doornfontein]	3 (AD 311–911)
285e	**KBE** Western Cape South Africa	Pastoralist	3 (AD 311–911)
285d	**KBDe** Western Cape South Africa	Pastoralist	3 (AD 311–911)
286	**Kasteelberg A [KBA]** Western Cape South Africa	Pastoralist	3 (AD 311–911)
287	**Kasteelberg B [KBB]** Western Cape South Africa	Pastoralist	3 (AD 311–911)
288	**Kasteelberg C [KBC]** Western Cape South Africa	Hunter-gatherer	3 (AD 311–911)

(*Continued*)

Table 2. (Continued)

Site Reference Number	Site name, region and country	Cultural Affiliation as identified by excavator/past research.	Map Number
267	**Diepkloof Rock Shelter**	Hunter-gatherer mix pastoralist	3 (AD 311–911)
	Western Cape		
	South Africa		
302a	**Elands Bay Cave**	Hunters-with-sheep or pastoralist	3 (AD 311–911)
	Western Cape		
	South Africa		
294	**Die Kelders [DK1]**	hunter-gatherer-fishers	3 (AD 311–911)
	southern Cape coast		
	South Africa		
2	**Oruwanje 95/1**	unspecified LSA groups	4 (AD 912–1512)
	Kunene		
	Namibia		
37	**Geduld**	Hunters on the periphery of pastoralist groups. [Smith et al. 1995]	4 (AD 912–1512)
	Kunene		
	Namibia		
27	**Falls Rock Shelter**	Pastoralist	4 (AD 912–1512)
	Erongo		
	Namibia		
69	**Striped Giraffe Shelter**	unspecified	4 (AD 912–1512)
	Erongo		
	Namibia		
52	**!Khuiseb Delta**	Pastoralist	4 (AD 912–1512)
	Erongo		
	Namibia		
167	**Ai Tomas**	Pastoralist	4 (AD 912–1512)
	Northern Cape		
	South Africa		
94	**Toteng 1**	Hunter-gatherers with access to trade networks with Bantu-language speaking farmers or Hunter-gatherers with livestock and Bambata pottery.	4 (AD 912–1512)
	North West		
	Botswana		
95	**Toteng 3**	Hunter-gatherers with access to trade networks with Bantu-language speaking farmers or Hunter-gatherers-livestock-keepers with Bambata pottery	4 (AD 912–1512)
	North West		
	Botswana		
234	**Wonderwerk**	Pastoralist [Doornfontein]	4 (AD 912–1512)
	Northern Cape		
	South Africa		
247	**Grootrif G [GFG]**	Hunter-gatherer	4 (AD 912–1512)
	Western Cape		
	South Africa		
257	**Tortoise Cave**	unspecified LSA group	4 (AD 912–1512)
	Western Cape		
	South Africa		
286	**Kasteelberg A [KBA]**	Pastoralist	4 (AD 912–1512)
	Western Cape		
	South Africa		

(*Continued*)

Table 2. (Continued)

Site Reference Number	Site name, region and country	Cultural Affiliation as identified by excavator/past research.	Map Number
287	**Kasteelberg B [KBB]**	Pastoralist	4 (AD 912–1512)
	Western Cape		
	South Africa		
291	**Heuningklip**	Pastoralist	4 (AD 912–1512)
	Western Cape		
	South Africa		
267	**Diepkloof Rock Shelter**	Hunter-gatherer	4 (AD 912–1512)
	Western Cape		
	South Africa		
316	**Nelson Bay Cave**	Herders	4 (AD 912–1512)
	Western Cape		
	South Africa		

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Pottery: Was pottery exchanged? Was it made by hunter-gatherers?

We suggest that pottery was introduced into southern Africa by a small group of migrating pastoralists around 2300 years ago [131, 132, cf. 42]. Their sites stand out as having evidence of livestock, bead manufacture and mineral-tempered pottery (Map 2 Fig 6, Table 1). They may have moved into the western part of South Africa, from Namibia and Northern Botswana, through the interior Nama biome and the succulent Karoo biome and the coastal areas (cf. [15, 38]). The evidence from sites containing both ostrich eggshell containers and pottery

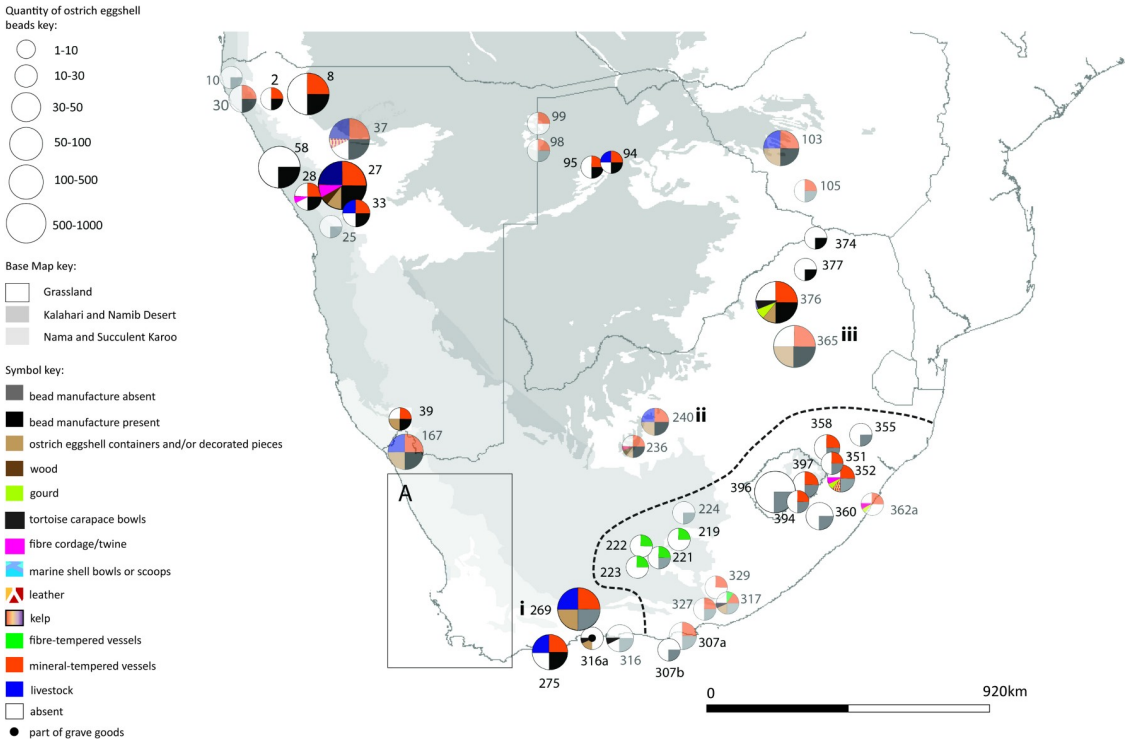

Fig 11. Map showing the southeastern part of South Africa and possible source areas for pottery and beads.

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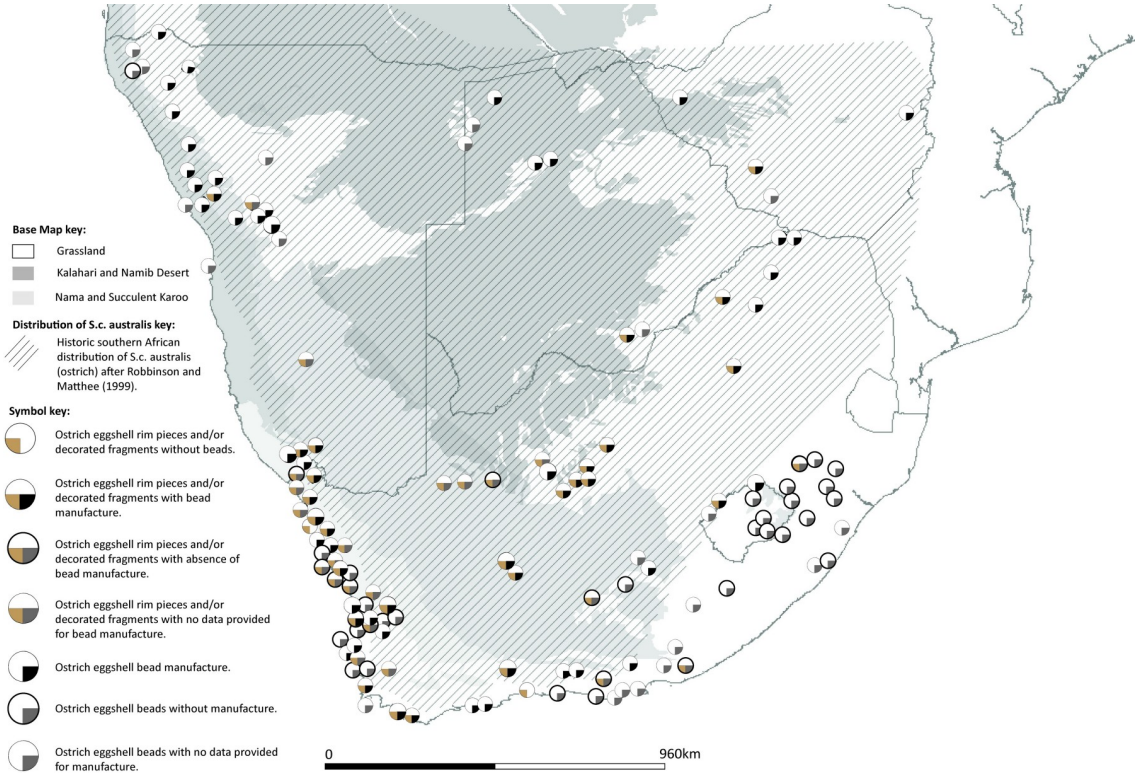

Fig 12. Map showing the distribution of ostrich eggshell finished beads, manufacture sites and containers against the natural habitat of the ostrich.

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suggests that hunter-gatherers quickly adopted pottery making (cf. [42]). It is possible that pottery was subsequently dispersed among hunter-gatherers in a combination of local innovation and exchange along existing exchange networks. This accounts for its widespread occurrence at many sites during the period 290 cal BC to cal AD 310 and for its variability in temper, decoration and shape (cf. [21]).

Acquisition of stock and the transition to pastoralism

In the period 290 cal BC to cal AD 310, some hunter-gatherers, through their interactions with incoming pastoralists, acquired stock and became livestock-keepers (Table 2). Using ostrich eggshell containers as a proxy for hunter-gatherer presence, we suggest that most sites with livestock (60%) represent hunter-gatherers with livestock. It is upon this data that we base our reasoning that the incoming pastoralists were small in number (40% of sites represent immigrant pastoralists) (see [38] who reaches a similar conclusion based on stone tool analysis). From this point we present two scenarios, neither of which can yet be verified. Scenario 1 is that these hunter-gatherer turned livestock-keepers then gradually became the dominant pastoralist group on the landscape and are the ancestors of the historically observed Khoe pastoralist groups. Scenario 2 is that this early demic and cultural diffusion process was followed by a later migration of pastoralists and that the numbers of hunter-gatherer people with livestock remained consistently low on the landscape. Scenario 2 fits with the time line offered by geneticists for the first appearance of pastoralists with an east African origin approximately 1200–1300 years ago [133, 134].

The distinctiveness of southeastern South Africa

The southeastern part of South Africa stands out as distinct in the mapping exercise (Fig 11). In the period 290 cal BC to cal AD 310, Later Stone Age sites in the area show no evidence of ostrich eggshell bead manufacture, although almost all of the sites have evidence of ostrich eggshell beads (Fig 12). There is also no evidence of the use of ostrich eggshell containers. This area is not a natural habitat for ostriches (see [53, 55, 129] nor were these items commonly exchanged between groups (Fig 12). These sites also contain no evidence of livestock (with the exception of undated, painted rock art images of fat-tailed sheep found in low numbers) [45]. Yet they nearly all have pottery. Thin-walled mineral-tempered vessels are found in the Maloti-Drakensberg and the Thukela river valley, whilst the interior sites in the succulent Karoo biome have fibre-tempered thick-walled vessels. The mapped evidence suggests that mineral-tempered pottery was diffusing along already established social exchange networks that carried finished ostrich eggshell beads into the area. The likely source for beads and mineral-tempered pottery for sites in KwaZulu-Natal and Lesotho are area (iii) (for example, the site of Jubilee shelter, 365) approximately 400–600 km away, or area (ii) (e.g the site of Limerock 2, 240) which is a distance of approximately 400–640 km away (Fig 11). It is likely that fibre-tempered, bowl-shaped pottery in this area represents a local innovation amongst hunter-gatherers. This is the first appearance of the use of fibre temper in southern Africa. It is unlikely the pottery came from elsewhere. Mineral-tempered, wide-mouthed bowls are found at two sites in the surrounding area at approximately the same time (at sites 269 (Boomplaas) and 294 (Die Kelders) (area i, Fig 11)). The fibre-tempered bowls slightly pre-date those with mineral-temper. The area with fibre-tempered pottery might also have been more socially isolated: not all sites have finished beads and they occur in low counts of 1 to 10 beads.

Continuing the hunter to herder debate

In recent research, Sadr [38] presented a new dataset presenting the ratios of backed stone tools to scrapers at 123 southern African archaeological sites. By comparing their ratio prior to the arrival of livestock (4000 to 2000 years ago) to that after the arrival of livestock (2000 to 1000 years ago), he concludes that a scraper-rich toolkit can be seen as a "cultural emblem" for southern Later Stone Age hunter-gatherer populations, whilst backed rich toolkits are linked to hunter-herders [38:9]. Webley [135] made a similar suggestion, that herder sites would lack formally retouched scrapers. Using this pattern, Sadr [38] recognises two small-scale migrations, one of which brought livestock and pottery along the Atlantic seaboard to the southern coast of South Africa. The other originated in the Zambezi watershed, with livestock and pottery introduced by hunter-herders but later adopted by hunter-gatherers moving in a westward direction across northern Botswana.

We have compared our data, where possible, to that of Sadr [38: Table 2]. Our results are complimentary: sites that we would classify as hunter-gatherer based on the presence of ostrich eggshell containers have scraper rich toolkits. Sadr works with a much longer time span than we do. He distinguishes two periods, before and after the arrival of livestock to the south. Further work using these two approaches in combination, for tighter and overlapping time spans, may prove productive.

Only two sites, Die Kelders (site 294) and Spoegrivier (site 165), contradict Sadr's [38] findings. He argues that the furthest south the northern backed toolkit makers (i.e. people bringing livestock and pottery) reached was the site of Die Kelders in the southern Cape, with its backed tool rich assemblage (250 cal BC–cal AD 350, 8.9% scrapers and 58.9% backed tools) [38: Table 2]. Our interpretation is different: between 290 cal BC to cal AD 310, the site was occupied by hunter-gatherers who used ostrich eggshell containers, as well as marine and tortoise

shell containers. They also used, and possibly made, mineral-tempered thin-walled pottery and manufactured ostrich eggshell beads. Later the site reflects a livestock-keeper signature, of mineral-tempered pottery and livestock. Ostrich eggshell containers are no longer used. This pattern can be interpreted in two ways: either the hunter-gatherers adopted livestock, the interpretation we favour, or an incoming group replaced them at around 300 cal AD. However, the stratigraphy at Die Kelders is disturbed [136]. It has been shown, by directly dating sheep bone, that smaller items, such as this bone, had moved from above through the Die Kelders stratigraphy into older layers [137]. It is possible that tiny backed tools, measuring 10 to 19 mm in height and a few mm in width have infiltrated the lower levels at Die Kelders. Backed tools occur in many layers at Die Kelders (layers 1 (the youngest level), 5, 7, 8, 9 and 12 (the oldest level) at the site [136: 173]) whereas scrapers (a hunter-gathers item [38]) are only found in the oldest layer, Layer 12, and are thus likely to be in situ.

At the site of Spoegriver Cave, Sadr [38: 11] notes that in Phase 1 the site had a scraper-rich stone tool assemblage (2030–1630 cal BC, 33% scrapers, 33% backed tools), and that this was replaced with a backed rich one that arrived with sheep and pottery (10–970 cal AD, 0% scrapers, 70% backed tools). Our data presents Spoegrivier as occupied by hunter-gatherers becoming livestock keepers from 290 cal BC to cal AD 310. The assemblage contains decorated ostrich eggshell containers, mineral-tempered pottery, evidence of bead manufacture and fibre/twine, and of sheep. Level 6b, the oldest level with pottery (38: 27) has one scraper (cf. [38]) and dates to this time bracket. This level has just one backed tool. In this case the large time slice used [38] may mask subtle changes through time. From approximately 300 AD, the only change to this signature is that the ostrich eggshell containers are undecorated and tortoise carapace bowls are found. We would interpret this as a case of hunter-gatherers becoming herders.

These results suggest the early presence of immigrant pastoralists at around 2300–2100 years BP. This is at odds with the earlier date of 1300 years BP for a pastoralist migration with origins in eastern Africa as suggested by geneticists–who state that this date may be an underestimate[133](cf. [134, 138, 139]). The only second migration event we detect in the data presented here, is that of Bantu-language-speaking farmers, whose pottery appears at sites in the eastern half of southern Africa (Map 3, Fig 7 and Map 4, Fig 8). The possibility of a more recent migration (circa 1200–1300 years BP) needs further exploration, as does the possibility that the genetic clock is incorrect or an underestimate, as stated by Breton et al. [133].

Vedder's [88] observation of Nama pastoralists with ostrich eggshell water containers warns us not to get too prescriptive about the significance of their occurrence, and is a reminder that in these interpretations we cannot rely on any one piece of evidence.

Conclusion

Genetic and linguistic analysis shows that there was a migration of genetically distinct stock-keepers into southern Africa [131, 132, 133, 134, 138]. The challenge for us is to try to identify this in the archaeology. Based on the ethnographic, historic and archaeological record for the occurrence of ostrich eggshell water containers in southern Africa, we suggest that ostrich eggshell containers are a marker of hunter-gatherers. This appears to be confirmed in their co-occurrence at sites that are scraper rich. Through the spatial temporal mapping of the co-occurrence of ostrich eggshell containers with pottery, we reason that these two types of containers fulfilled different functions for hunter-gatherers. As hunter-gatherers became stock-keepers their use of ostrich eggshell dwindled. The data presented show that pottery spread rapidly to sites across southern Africa from 2300 years ago. We suggest that pottery, first introduced by a small group of immigrant pastoralists, was quickly adopted and made by hunter-

gatherers and then spread by cultural diffusion (cf. [30]). Through the mapping of bead manufacture sites relative to sites with evidence of finished beads only, we are able to argue that both mineral-tempered pottery and beads may have been brought to the southeastern part of South Africa on pre-existing hunter-gatherer exchange networks (cf. [125]). By the same reasoning, it appears that the manufacture of fibre-tempered vessels was unique to hunter-gatherers during this period. We raise the hypothesis that sites with livestock, pottery and ostrich eggshell containers represent autochthonous hunter-gatherers becoming livestock-keepers. It is possible that this group then became the dominant pastoralists on the landscape, eventually giving rise to the Khoe-pastoralists as known from the historic period.

Supporting information

S1 Map. KMZ file to show the temporal and geographic spread of the data contained within Database 1.
(KML)

S1 Table. The sources used in the compilation of Database 1.
(DOCX)

S2 Table. The material from six of the sites in Database 1, recorded during museum collection visits, 2017.
(DOCX)

S3 Table. Historic and ethnographic accounts of the use of containers in southern Africa, 16th century AD to the present.
(DOCX)

S1 Appendix. Database 1 and 2.
(XLSX)

S2 Appendix. Spoegriver (165) and Jakkalsberg B (170). Examples of fibre-tempered and mineral tempered pottery, twine and ostrich eggshell photographed during museum collection visits, 2017.
(TIF)

S3 Appendix. Blinkklipkop (235) and dikbosch 1 (236). Examples of mineral tempered pottery and ostrich eggshell photographed during museum collection visits, 2017.
(TIF)

S4 Appendix. Haaskraal (221) and Die Kelders (294). Examples of fibre-tempered and mineral tempered pottery, twine and ostrich eggshell photographed during museum collection visits, 2017.
(TIF)

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Chapter 7: Conclusions

The questions posed at the start of this thesis asked whether the archaeological data might allow us to distinguish cultural from demic diffusion in the spread of novel traits beginning at 2300 years ago in southern Africa, and whether the approach taken here might contribute to our understanding of southern Africa's history.

Throughout the thesis the emphasis has been on the nature of the archaeological material record and its robustness as evidence for understanding: (1) the spread of early livestock-keepers and pottery-users – the hunter-herder debate, (2) the antiquity and existence of an archaeological Iron Age farmer package and (3) the role of autochthonous hunter-gatherers in these processes. The approach was a response to fast-paced genetic research that finds population migration as the main explanation for change in the past (Henn *et al.* 2008; Breton *et al.* 2014; Macholdt *et al.* 2014), frequently overshadowing the presence of hunter-gatherers on the landscape. However, migration is difficult to distinguish from cultural diffusion processes using the archaeological record. A renewed assessment of the archaeology, in light of the genetic push, seemed timely.

To address this a spatio-temporal analysis of five southern African geo-referenced databases is presented. The approach involved a three-tiered process– first, to compile meaningful, qualitative and quantitative archaeological databases, second, to visualise the data at different temporal and spatial scales and third, to make interpretations of the archaeology based on this analysis.

Before assessing the contributions the thesis makes I raise the challenges and limitations I encountered.

The uneven geographic coverage of southern African archaeological research is evident in the data visualisations presented. This unevenness was confirmed by

mapping research intensive hotspots in Chapter 4. In Chapter 5, I further illustrate this bias by mapping undated and unpublished sites from the KwaZulu-Natal Museum Digital Database. Research biases such as these have obvious implications for how spatial patterns are perceived and interpreted and how much sense we can make of the past. A way towards correcting this bias might be to collect the data provided in reports made by Contract Archaeologists (CRM practioners). These reports and repositories are generally sequestered and difficult to access but perhaps through engaging in collaborative archival and database projects this may be a way to improve our coverage of the archaeology of a region (Snow 2006).

The varied quality of published site reporting presented a number of challenges as discussed. It was frequently difficult to determine exactly when a particular find occurred because the archaeology had been grouped together without adequate contextual information. This was particularly the case in the reporting of finds from agropastoralist sites. Unfortunately, there was no way to mitigate this.

To overcome issues surrounding poor radiocarbon dates and their associations a date rating system was used. The date rating system whilst useful does not deal with the actual problem. Studies have shown that directly dated livestock bone is younger than its archaeological context, however no comment is made on pottery and I have raised concerns that perhaps the pottery is also out of context. Further work to directly date pottery is needed, particularly as pottery is frequently seen as an important marker by southern Africanist archaeologists.

An observation made when compiling *the southern African database for the appearance of livestock, pottery, metal and crops* is that there are no direct dates on livestock bones from agropastoralist contexts. This is surprising given that there has been a concerted effort amongst Later Stone Age researchers to directly date livestock remains from sites. To redress this, Russell and King (pers. comm 2020) are undertaking a project to directly date livestock bones from farmer sites in South Africa.

In the maps, temporal groupings of 200 (Chapter 4), 300 (Chapter 5) and 600 (Chapter 6) year time slices (BP) are used. This represents a time span of approximately eight, 12 and 24 generations of human occupation respectively. This is the level of accuracy that needs to be kept in mind when looking at the maps presented and is an obvious limitation, as the grouping of dating introduces biases into the visualisations that are presented. However, each of the databases provide the detailed chronological information and archaeological associations, and are available for future research at different scales of manipulation. Hiatuses at sites, periods when they were not occupied by humans, are not shown in the maps presented in Chapters 4 and 6, due to time constraints. However, the mapping presented in Chapter 5 illustrates the usefulness of including these occupational breaks in analysis as they reveal a more nuanced pattern of past land use.

As a conclusion to the thesis I summarise its five key contributions below.

Research contributions and findings

1. *Open access spatio-temporal archaeological databases.*
   The three archaeological databases provide the major contribution of this work. This is the first time that the material assemblages of hunter-gatherers, pastoralists and farmers have been drawn together at a large-scale and with the accompanying data at a fine enough resolution to explore the data. It is also the first time that other types of archaeological material culture – organic containers- have been included in a large-scale spatio-temporal analysis.

2. *Changes through time but not space in the hunter-herder archaeology*
   The archaeological record presented for this time period in southern Africa allows us to consider changes through time, however, given the research lacunae that exists in southern African archaeology, I suggest it is premature to investigate change through space. The mapping of archaeological data in Chapters 4 and 6 reveal a remarkably static picture of archaeological sites

through space, particularly within the hunter-herder archaeology. This might be explained by research biases demonstrated in the thesis with a focus on rock shelter and coastal cave sites with deep stratigraphic sequences of human occupation (c.f. Arthur 2008). Whilst static in space, a pattern (through time) was revealed, and this is the enduring presence of hunter-gatherers and herders on the landscape beginning at around 2300 years ago. It is a pattern that throws up questions about the type of population mobility that is frequently associated with both hunter-gatherers and herders in southern Africa (c.f. Sadr 2003, Arthur 2008). The analysis has led to me to conclude that items are moving, not necessarily people. But this needs further exploration

3. *Cultural diffusion as the main mechanism for change 2300 years ago.*
   I have presented the hypothesis that cultural diffusion was the main mechanism for the spread of pottery-making and livestock-keeping 2300 years ago, by using organic ostrich eggshell containers as a proxy for Later Stone Age hunter-gatherers. A particularly striking pattern to emerge from this analysis was the wide-spread and rapid uptake of pottery by autochthonous hunter-gatherers. Whether or not hunter-gatherers made this pottery still remains to be answered. This analysis shows how important it is to include the hunter-gatherer archaeology.

4. *The timing and occurrence of archaeological 'packages'*
   The suggestion that early livestock and pottery arrived as a 'package' at sites in the drier western half of southern Africa was dispelled as direct dating of sheep proved that they were younger than the layers in which they were found (Sealy & Yates 1994, 1996; Sadr 1998). In 'Iron Age' research too, a package of farmer traits has been suggested (Voigt 1986; Huffman 1990, 1993, 1998, 2001). The presence of both of these packages were explored during the mapping exercises and the results challenge the conventional understanding. Livestock-bearing sites show the coeval appearance of livestock and pottery in the drier western part of southern Africa whilst at

agropastoralist sites crops predate livestock. Our findings support earlier suggestions made by Phillipson (1977) and later by Holden and Mace (2003) that farmers spread without livestock, arriving ahead of agropastoralism in southern Africa. How livestock were initially acquired by agriculturists is not resolved and requires further investigation.

5. *Agropastoralist-hunter-gatherer relations through time (KwaZulu-Natal).* The spatio-temporal analysis of hunter-gatherer and agropastoralist sites in the Thukela River Basin and northern uKhahlamba Drakensberg of KwaZulu-Natal revealed unexpected patterns in what I interpret as the nature of the relations between the two groups. My analysis suggests that early agriculturists were having to negotiate their way into already occupied space in the Thukela Basin and traces the changing relations between the two groups through time, as the exchange of material items between the groups was replaced with services. This would make for interesting comparison to other regions in southern Africa. For example, in the southwestern Cape, the relations between hunter-gatherers and pastoralists seem different with hunter-gatherers retreating to the Cape Fold Belt mountains as pastoralists moved into the coastal plains (Parkington & Hall 1987).

The thesis provides data that I hope will be improved upon and utilised by researchers interested in this field. I expect that the findings I have presented will change and others will be overturned as the quality and coverage in southern Africa's archaeology improves.

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A list of site names, radiocarbon dates and geographic locations captured in the three southern African archaeological databases**.** 187

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Site Name	*Country*	*Latitude*	*Longitude*	*uncal. Radiocarbon determination or AMS date*	*SD*	*Lab Code*	*Type of material Dated*	*Broad subsistence category*
Benifica	Angola	-8.96025	13.1905111	1810	50	Pta-212	charcoal	Farming
Bisoli	Botswana	-21.033333	27.5666667	1340	60	Wits-1099	-	Farming
Bisoli	Botswana	-21.033333	27.5666667	1240	80	I-12708	-	Farming
Bosutswe	Botswana	-21.9525	26.6108333	1400	60	TX-6991	-	Farming
Bosutswe	Botswana	-21.9525	26.6108333	1370	60	TX-6994	-	Farming
Bosutswe	Botswana	-21.9525	26.6108333	1230	60	TX-6997	-	Farming
Bosutswe	Botswana	-21.9525	26.6108333	1200	60	TX-6992	-	Farming
Bosutswe	Botswana	-21.9525	26.6108333	1170	80	TX-6982	-	Farming
Cae Cae 2 [Xai Xai or Nxai Nxai]	Botswana	-19.934544	21.0782389	2165	50	-	charcoal	LSA
Cae Cae 2 [Xai Xai or Nxai Nxai]	Botswana	-19.934544	21.0782389	2260	65	-	charcoal	LSA
Cae Cae 2 [Xai Xai or Nxai Nxai]	Botswana	-19.934544	21.0782389	1765	55	-	charcoal	Hunter-gatherer
Cae Cae 2 [Xai Xai or Nxai Nxai]	Botswana	-19.934544	21.0782389	1150	60	-	-	LSA farmer and pastoralist items
Depression Cave	Botswana	-18.676775	21.8581667	1860	90	Beta-22878	-	Hunter-gatherer
Divuyu	Botswana	-18.75	21.75	1400	70	Beta-13260	charcoal	Farming
Divuyu	Botswana	-18.75	21.75	1370	60	Beta-13269	charcoal	Farming
Divuyu	Botswana	-18.75	21.75	1330	60	Beta-13264	charcoal	Farming
Divuyu	Botswana	-18.75	21.75	1330	60	Beta-13265	charcoal	Farming
Divuyu	Botswana	-18.75	21.75	1220	70	Beta-13267	charcoal	Farming
Divuyu	Botswana	-18.75	21.75	1190	70	Beta-13266	charcoal	Farming
Domboshaba	Botswana	-20.6	27.3666667	1150	80	I-13746	-	Farming
Lotshitshi	Botswana	-20.021922	23.5121528	1660	100	-	bone	LSA with pottery and cattle
Magarape	Botswana	-24.434444	25.9572222	1350	80	KN-2641	-	Farming
Mahopa 1	Botswana	-19.502417	21.2317667	1990	50	-	charcoal	Hunter-gatherer
Matlhapaneng	Botswana	-19.905208	23.5259194	1270	80	-	-	Farming
Matlhapaneng	Botswana	-19.905208	23.5259194	1260	60	-	-	Farming
Matlhapaneng	Botswana	-19.905208	23.5259194	1190	80	-	-	Farming
Matlhapaneng	Botswana	-19.905208	23.5259194	1120	110	-	-	Farming
Maunatlala	Botswana	-23.174064	27.5138778	1570	140	-	-	Farming
Nqoma	Botswana	-18.847978	22.0196389	1290	60	Beta-13257	charcoal	Farming
Nqoma	Botswana	-18.847978	22.0196389	1220	70	Beta-13256	charcoal	Farming
Nqoma	Botswana	-18.847978	22.0196389	1100	80	ISO-11411	-	Farming
Nqoma	Botswana	-18.847978	22.0196389	1000	60	Beta-13260	-	Farming
Qogana	Botswana	-19.004278	23.0186083	1190	80	-	-	Farming

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Site Name	***Country***	***Latitude***	***Longitude***	***uncal. Radiocarbon determination or AMS date***	***SD***	***Lab Code***	***Type of material Dated***	***Broad subsistence category***
Radiepolong	Botswana	-24.695625	25.4915333	820	70	Beta-107605	charcoal	Hunter-gatherers-with-livestock and early contact with farmers.
Radiepolong	Botswana	-24.695625	25.4915333	800	60	Beta-107604	charcoal	Hunter-gatherers-with-livestock and early contact with farmers.
Rhino Cave	Botswana	-18.733522	21.7325056	980	80	Beta-84719	charcoal	Hunter-gatherer/Pastoralist
Taukome	Botswana	-21.883333	26.9333333	1265	80	I-11407	-	Farming
Taukome	Botswana	-21.883333	26.9333333	1240	80	I-11410	-	Farming
Thamaga 1	Botswana	-24.697486	25.4919333	1190	90	I-13181	charcoal	Hunter-gatherer with Farmer contacts
Toteng 1	Botswana	-20.367933	22.9511111	**2020**	**40**	**Beta-18669**	**cow bone**	Hunter-gatherers-livestock-keepers
Toteng 1	Botswana	-20.367933	22.9511111	**2070**	**40**	**Beta-1904888**	**sheep bone**	Hunter-gatherers-livestock-keepers
Toteng 1	Botswana	-20.367933	22.9511111	1990	60	Beta-44963	charcoal	Hunter-gatherers-livestock-keepers
Toteng 1	Botswana	-20.367933	22.9511111	1820	50	Pta-5534	charcoal	Hunter-gatherers-livestock-keepers
Toteng 1	Botswana	-20.367933	22.9511111	**1639**	**33**	**AA-58186**	**charcoal temper from undecorated body sherd.**	Hunter-gatherers-livestock-keepers
Toteng 1	Botswana	-20.367933	22.9511111	1560	60	Beta-184609	charcoal	Hunter-gatherers-livestock-keepers
Toteng 1	Botswana	-20.367933	22.9511111	**1480**	**40**	**Beta-186670**	**cow bone**	Hunter-gatherers-livestock-keepers
Toteng 1	Botswana	-20.367933	22.9511111	**643**	**31**	**AA-58187**	**charcoal temper from**	Hunter-gatherers-

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Site Name	*Country*	*Latitude*	*Longitude*	*uncal. Radiocarbon determination or AMS date*	*SD*	*Lab Code*	*Type of material Dated*	*Broad subsistence category*
							undecorated body sherd.	livestock-keepers
Toteng 1	Botswana	-20.367933	22.9511111	610	45	Pta-5531	charcoal	Hunter-gatherers-livestock-keepers
Toteng 1	Botswana	-20.367933	22.9511111	**571**	**31**	**AA-58188**	**charcoal temper from undecorated body sherd.**	Hunter-gatherers-livestock-keepers
Toteng 3	Botswana	-20.367933	22.9511111	1810	60	Beta-44965	charcoal	Hunter-gatherers-livestock-keepers
Toteng 3	Botswana	-20.367933	22.9511111	**1710**	**40**	**Beta-194360**	**carbon within Bambata sherd from 1991 excavation.**	Hunter-gatherers-livestock-keepers
Toteng 3	Botswana	-20.367933	22.9511111	**1610**	**40**	**Beta-182060**	**organic residue in undecorated body sherd.**	Hunter-gatherers-livestock-keepers
Toteng 3	Botswana	-20.367933	22.9511111	1600	50	Beta-44966	charcoal	Hunter-gatherers-livestock-keepers
Toteng 3	Botswana	-20.367933	22.9511111	**1130**	**40**	**Beta-186671**	**poorly preserved sheep/goat molar**	Hunter-gatherers-livestock-keepers
White Paintings Rock Shelter [WPS]	Botswana	-18.771897	21.74985	**1225**	**60**	**OxA-6038**	**sheep jaw [direct AMS]**	Hunter-gatherer context with Early Farmer component
White Paintings Rock Shelter [WPS]	Botswana	-18.771897	21.74985	1080	100	Beta-33056	charcoal	Hunter-gatherer context with Early Farmer component
Bolahla	Lesotho	-30.066667	28.4	910	80	Pta-5549	charcoal	Hunter-gatherer
Likoaeng	Lesotho	-29.735556	28.7630556	2000	70	Pta-9048	wood charcoal	Hunter-gatherer-fishers.
Likoaeng	Lesotho	-29.735556	28.7630556	1850	40	Pta-7092	wood charcoal	Hunter-gatherer-fishers.

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Likoaeng	Lesotho	-29.735556	28.7630556	1850	15	Pta-7097	wood charcoal	Hunter-gatherer-fishers.
Likoaeng	Lesotho	-29.735556	28.7630556	1830	15	Pta-7865	wood charcoal	Hunter-gatherer-fishers.
Likoaeng	Lesotho	-29.735556	28.7630556	1310	80	Pta-7877	wood charcoal	Hunter-gatherer contact with farmers
Likoaeng	Lesotho	-29.735556	28.7630556	1285	40	GrA-23237	sheep	Hunter-gatherer with livestock and contact with farmers
Likoaeng	Lesotho	-29.735556	28.7630556	1290	30	GrA-26831	iron	Hunter-gatherer with livestock and contact with farmers
Liphofung	Lesotho	-28.900692	28.4616222	2700	60	Pta-6106	bone	Hunter-gatherer
Melikane	Lesotho	-29.95	28.75	1440	40	Pta-1364	organic material	Hunter-gatherer
Moshebi's Shelter	Lesotho	-29.933333	29.0333333	2200	25	UGAMS-11589	charcoal	Hunter-gatherer
Moshebi's Shelter	Lesotho	-29.933333	29.0333333	2180	45	Pta-319	charcoal	Hunter-gatherer
Muela Rock Shelter	Lesotho	-28.766667	28.4630556	730	50	Pta-6329	charcoal	Hunter-gatherer
Pitsaneng	Lesotho	-29.727778	28.7927778	**960**	**90**	**OxL-1314**	**OSL date/pottery**	Hunter-gatherer-livestock-keepers and contact with farmers
Pitsaneng	Lesotho	-29.727778	28.7927778	**870**	**80**	**OxL-1316**	**OSL date/pottery**	Hunter-gatherer-livestock-keepers and contact with farmers
Pitsaneng	Lesotho	-29.727778	28.7927778	840	40	Pta-8491	charcoal	Hunter-gatherer-livestock-keepers and contact with farmers
Pitsaneng	Lesotho	-29.727778	28.7927778	810	50	Pta-8360	charcoal	Hunter-gatherer-livestock-keepers and

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Site Name	***Country***	***Latitude***	***Longitude***	***uncal. Radiocarbon determination or AMS date***	***SD***	***Lab Code***	***Type of material Dated***	***Broad subsistence category***
								contact with farmers
Sehonghong	Lesotho	-29.766667	28.7833333	1710	50	Pta-6063	charcoal	Hunter-gatherer-fishers [Ceramic Wilton]
Sehonghong	Lesotho	-29.766667	28.7833333	1400	50	Pta-885	charcoal	Hunter-gatherers [possible hunter-gatherer-livestock-keepers]
Sehonghong	Lesotho	-29.766667	28.7833333	1240	50	Pta-6084	charcoal	Hunter-gatherers [possible hunter-gatherer-livestock-keepers]
Banda Hill	Malawi	-14.35	34.2833333	1400	50	Pta-1602	charcoal	Farming
Chia Lagoon	Malawi	-13.183333	34.3166667	935	50	Pta-2147	charcoal	Farming
Lumbule Hill	Malawi	-10.066667	34.1	1385	100	SR-147	charcoal	Farming
Mitongwe/ Liwadzi	Malawi	-14.266667	34.1833333	1730	90	SR-209		Farming
Namaso Bay	Malawi	-14.166667	34.9833333	1555	110	GX-14812	-	Farming
Namaso Bay	Malawi	-14.166667	34.9833333	1300	260	GX-14811	-	Farming
Namaso Bay	Malawi	-14.166667	34.9833333	1160	50	Pta-3754	-	Farming
Namaso Bay	Malawi	-14.166667	34.9833333	1090	50	Pta-3752	-	Farming
Namaso Bay	Malawi	-14.166667	34.9833333	1075	75	GX-14813	-	Farming
Namaso Bay	Malawi	-14.166667	34.9833333	1060	85	GX-14814	-	Farming
Nkope Bay	Malawi	-14.2	35.0333333	1590	120	SR-174	charcoal	Farming
Phopo Hill	Malawi	-11.25	33.6166667	1655	95	SR-128	charcoal	Farming
Phopo Hill	Malawi	-11.25	33.6166667	1745	170	SR-148	charcoal	Farming
Phopo Hill	Malawi	-11.25	33.6166667	1445	120	SR-161	charcoal	Farming
Tambala	Malawi	-14.15	34.25	1360	50	Pta-927	charcoal	Farming
Changalane I	Mozambique	-26.316944	32.1438889	**1930**	**50**	-	**carbon dated pottery**	Farming
Changalane II	Mozambique	-26.316944	32.1438889	**2170**	**50**	-	**carbon dated pottery**	Farming
Chibuene	Mozambique	-22.033889	35.325	1410	75	Ua-16272	charcoal	Farming

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Chibuene	Mozambique	-22.033889	35.325	1400	85	St-8495	charcoal	Farming
Chibuene	Mozambique	-22.033889	35.325	1270	80	St-8494	charcoal	Farming
Chibuene	Mozambique	-22.033889	35.325	1180	50	St-1325	charcoal	Farming
Chibuene	Mozambique	-22.033889	35.325	1155	85	St-8496	charcoal	Farming
Chibuene	Mozambique	-22.033889	35.325	1080	80	St-8495	charcoal	Farming
Lumbi	Mozambique	-18.126	35.6961389	1558	30	UA-40067	charcoal	Farming
Lumbi	Mozambique	-18.126	35.6961389	1892	30	UA-40070	charcoal	Farming
Lumbi	Mozambique	-18.126	35.0294722	1900	30	UA-40071	charcoal	Farming
Malessane	Mozambique	-15.069547	37.5467917	1740	40	ICEN-132	-	Farming
Matola IV	Mozambique	-25.9625	32.3638889	1880	50	-1327	charcoal	Farming
Matola IV	Mozambique	-25.9625	32.3638889	1720	110	St-8547	charcoal	Farming
Matola IV	Mozambique	-25.9625	32.3638889	1470	80	St-8546	charcoal	Farming
Rian	Mozambique	-13.733333	40.15	1870	35	ICEN-133	-	Farming
Rian	Mozambique	-13.733333	40.15	1485	170	ST-9021	-	Farming
University Campus	Mozambique	-25.958333	32.6	**2190**	**60**	-	**pottery**	Farming
University Campus	Mozambique	-25.958333	32.6	1775	85	St-9836	charcoal	Farming
University Campus	Mozambique	-25.958333	32.6	1590	75	St-9838	charcoal	Farming
University Campus	Mozambique	-25.958333	32.6	1355	100	St-9837	charcoal	Farming
Zitundo	Mozambique	-26.744444	32.825	2200	50	-	pottery	Farming
Zitundo	Mozambique	-26.744444	32.825	1760	105	St-8911	charcoal	Farming
Zitundo	Mozambique	-26.744444	32.825	1775	50	St-8909	charcoal	Farming
Zitundo	Mozambique	-26.744444	32.825	1685	105	St-8912	charcoal	Farming
Zitundo	Mozambique	-26.744444	32.825	1575	105	St-8913	charcoal	Farming
Zitundo	Mozambique	-26.744444	32.825	1435	105	St-8910	charcoal	Farming
Zitundo	Mozambique	-26.744444	32.825	**1490**	**50**	-	**pottery**	Farming
!Khuiseb Delta	Namibia	-23.216806	15.625	620	50	KN-3599	-	Pastoralist
!Khuiseb Delta	Namibia	-23.216806	15.625	410	50	KN-3600	-	Pastoralist
!Khuiseb Delta	Namibia	-23.216806	15.625	350	85	KN-3597	-	Pastoralist
!Khuiseb Delta (End Midden)	Namibia	-23.216806	15.625	1170	50	KN-3598	charcoal	Pastoralist
!Khuiseb Delta (Liz's Midden)	Namibia	-23.216806	15.625	1600	50	Pta-4004	charcoal	Pastoralist
!Khuiseb Delta [Ward's Midden]	Namibia	-23.216806	15.625	1170	50	KN-3598	charcoal	Pastoralist
Amis 10	Namibia	-21.119283	14.4732361	2760	50	KN-3544	-	LSA
Amis 11	Namibia	-21.119283	14.4732361	2710	60	KN-4117	-	LSA
Amis 17	Namibia	-21.119283	14.4732361	2680	50	KN-4066	-	LSA

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Amis 17	Namibia	-21.119283	14.4732361	2400	55	KN-4065	-	LSA
Apollo 11	Namibia	-27.75	17.1	1960	45	Pta-1918	twigs	unspecified LSA groups
Apollo 11	Namibia	-27.75	17.1	1670	55	KN-I.870	uncharred twigs	unspecified LSA groups [Pottery Wilton]
Apollo 11	Namibia	-27.75	17.1	1460	55	KN-I.846	uncharred twigs	unspecified LSA groups [Pottery Wilton]
Apollo 11	Namibia	-27.75	17.1	490	45	KN-I.608	charcoal	unspecified LSA groups [Final LSA with pottery]
Apollo 11	Namibia	-27.75	17.1	320	40	Pta-1009	charcoal	unspecified LSA groups [Final LSA with pottery]
Arrisdrift	Namibia	-28.466667	16.6833333	1200	50	Pta-1933	charcoal	unspecified
Arrisdrift	Namibia	-28.466667	16.6833333	1250	130	Pta-1945	soot from pot	unspecified
Austerlitz	Namibia	-20.416667	14.4	910	55	KN-I635	-	unspecified
Big Elephant Shelter	Namibia	-21.683333	15.6666667	2600	50	Pta-1556	charcoal	LSA
Big Elephant Shelter	Namibia	-21.683333	15.6666667	2550	80	UCLA-724A	charcoal	LSA
Big Elephant Shelter	Namibia	-21.683333	15.6666667	1400	80	UCLA-724B	charcoal	Hunter-gatherer [with pottery]
Big Elephant Shelter	Namibia	-21.683333	15.6666667	1080	50	Pta-1558	charcoal	Hunter-gatherer [with pottery]
Conception Bay	Namibia	-24.016667	14.5666667	620	40	Pta-902	soot from pot	Pastoralist
Eros	Namibia	-22.55	17.0833333	1745	35	GrN-5297	-	unspecified
Fackelträger	Namibia	-21.566667	15.5333333	2740	45	KN-461	charcoal	LSA
Fackelträger	Namibia	-21.566667	15.5333333	2730	45	KN-460	charcoal	LSA
Fackelträger	Namibia	-21.566667	15.5333333	2190	40	KN-I.732	charcoal	LSA
Fackelträger	Namibia	-21.566667	15.5333333	2150	60	KN-I.731	charcoal	LSA
Falls Rock Shelter	Namibia	-21.2	14.55	2100	50	Pta-2929	charcoal	Hunter-gatherer livestock-keepers
Falls Rock Shelter	Namibia	-21.2	14.55	1880	50	Pta-2927	charcoal	Hunter-gatherer

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Site Name	***Country***	***Latitude***	***Longitude***	***uncal. Radiocarbon determination or AMS date***	***SD***	***Lab Code***	***Type of material Dated***	***Broad subsistence category***
								livestock-keepers
Falls Rock Shelter	Namibia	-21.2	14.55	2040	50	Pta-2930	charcoal	Hunter-gatherer livestock-keepers
Falls Rock Shelter	Namibia	-21.2	14.55	730±	70	Wits-1100	charcoal	Pastoralist
Geduld	Namibia	-20.283333	15.8333333	2300	50	Pta-5872	charcoal	LSA
Geduld	Namibia	-20.283333	15.8333333	1980	50	Pta-4413	charcoal	Hunters on the periphery of pastoralist groups.
Geduld	Namibia	-20.283333	15.8333333	1790	80	Pta-4419	dung	Hunters on the periphery of pastoralist groups.
Geduld	Namibia	-20.283333	15.8333333	1790	50	Pta-2720	charcoal	Hunters on the periphery of pastoralist groups.
Geduld	Namibia	-20.283333	15.8333333	800	50	Pta-4416	charcoal	Hunters on the periphery of pastoralist groups.
Hartmann Valley 95/4	Namibia	-17.502078	12.4792417	1480	30	KN-5287	charcoal	unspecified LSA group [Phase 2: Ceramic LSA]
Hartmann Valley 95/4	Namibia	-17.502078	12.4792417	1407	50	KN-4851	charcoal	unspecified LSA group [Phase 2: Ceramic LSA]
Hartmann Valley 95/4	Namibia	-17.502078	12.4792417	860	35	KN-5286	charcoal	Mixed: unspecified LSA groups [Historical and Ceramic LSA]
Hottentot Bay	Namibia	-26.15	14.9666667	490	50	Pta-2295	soot from pot	unspecified
Kanono Mulapo	Namibia	-17.9367	24.1494	**1230**	**50**	**Pta-8656**	**charcoal extracted from pottery**	Farming
Kanono Mulapo	Namibia	-17.9367	24.1494	**1050**	**20**	**Pta-8647**	**charcoal extracted from pottery**	Farming

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Kapako	Namibia	-17.916667	19.6666667	**1550**	**30**	**POZ-20679**	**charcoal extracted from pottery**	Metal-working
Kapako	Namibia	-17.916667	19.6666667	1110	50	Pta-234	charcoal	Metal-working
Kuidas Spring [KRS2]	Namibia	-20.63175	13.8463889	2264	27	OxA-27894	charcoal	LSA
Kuidas Spring [KSC14]	Namibia	-20.63175	13.8463889	952	24	OxA-27893	charcoal	unspecified [hunters or pastoralists]
Kuidas Spring [KSC14]	Namibia	-20.63175	13.8463889	952	24	OxA-27893	charcoal	unspecified [hunters or pastoralists]
Leopard Cave	Namibia	-21.572778	15.555	2430	50	Beta-236963	charcoal	LSA
Leopard Cave	Namibia	-21.572778	15.555	**2270**	**40**	**Beta-270164**	**teeth [caprine]**	unspecified [LSA groups]
Lüderitz	Namibia	-26.633333	15.15	300	50	Pta-2264	soot from pot	unspecified
Maguams Andalusia	Namibia	-25.533333	16.8666667	490	50	KN-I.631	charcoal	unspecified LSA groups
Maguams Andalusia	Namibia	-25.533333	16.8666667	380	50	Pta-2662	charcoal	unspecified LSA groups
Messum 1	Namibia	-21.366667	14.2833333	2820	55	KN-I.638	charcoal	LSA
Messum 1	Namibia	-21.366667	14.2833333	2090	45	KN-I.639	charcoal	Pre-pottery LSA Wilton
Messum 1	Namibia	-21.366667	14.2833333	2070	90	KN-I.637	charcoal	Pre-pottery LSA Wilton
Messum 1	Namibia	-21.366667	14.2833333	1370	50	Pta-2681	plant fibre	unspecified LSA group [Pottery Phase at site]
Messum 1	Namibia	-21.366667	14.2833333	860	55	KN-I.636	charcoal	unspecified LSA groups [LSA Ceramic]
Mirabib Hill Shelter	Namibia	-23.45	15.3166667	1550	50	Pta-1535	dung	unspecified LSA groups
N2000/2	Namibia	-18.029242	12.4497222	1850	40	KIA-17709	charcoal	LSA
N2002/7	Namibia	-18.296267	12.0262	1235	35	KIA-21034	charcoal	unspecified LSA groups
N2002/7	Namibia	-18.296267	12.0262	1175	25	KIA-18893	soot from sherd	unspecified LSA groups
N2002/7	Namibia	-18.296267	12.0262	1150	30	KIA-21035	charcoal	unspecified LSA groups
N2002/7	Namibia	-18.296267	12.0262	1065	30	KN-5564	charcoal	unspecified LSA group
N2005/2	Namibia	-19.05	13.5333333	2090	35	KN-578	charcoal	Unspecified LSA groups

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Nautilus	Namibia	-26.616667	15.1833333	400	50	Pta-2296	soot from pot	unspecified
Numas Schlucht	Namibia	-21.116667	14.4166667	420	140	Pta-2642	carbonaceous material from pot	unspecified LSA groups
Omungunda 99/1	Namibia	-18.024922	13.7866528	2600	35	KN-5674	charcoal	Hunter-gatherer
Omungunda 99/10	Namibia	-18.024922	13.7866528	1298	23	KIA-16047	charcoal	unspecified LSA groups [Phase 2: Late Ceramic LSA]
Omungunda 99/11	Namibia	-18.024922	13.7866528	1145	35	KN-5288	charcoal	unspecified LSA group [Phase 2: Late Ceramic LSA]
Omungunda 99/11	Namibia	-18.024922	13.7866528	985	35	KN-5289	charcoal	unspecified LSA groups [Phase 2: Late Ceramic LSA]
Omungunda 99/11	Namibia	-18.024922	13.7866528	535	35	KN-5455]	charcoal	unspecified LSA groups [Phase 1: Historical]
Omungunda 99/2	Namibia	-18.024922	13.7866528	2511	37	KIA-22462	charcoal	Hunter-gatherer
Omungunda 99/3	Namibia	-18.024922	13.7866528	2345	35	KN-5675	charcoal	Hunter-gatherer
Omungunda 99/4	Namibia	-18.024922	13.7866528	2242	23	KIA-24949	charcoal	Hunter-gatherer
Omungunda 99/4	Namibia	-18.024922	13.7866528	1956	31	KIA-16043	charcoal	unspecified LSA groups
Omungunda 99/4	Namibia	-18.024922	13.7866528	1940	22	KIA-16045	charcoal	unspecified LSA groups
Omungunda 99/4	Namibia	-18.024922	13.7866528	1842	25	KIA-11982	charcoal	Unspecified LSA groups
Omungunda 99/4	Namibia	-18.024922	13.7866528	1835	30	KIA-11982	charcoal	Unspecified LSA groups
Omungunda 99/4	Namibia	-18.024922	13.7866528	1810	35	KN-5639	charcoal	unspecified LSA groups
Omungunda 99/4	Namibia	-18.024922	13.7866528	1739	23	KIA-16049	charcoal	Unspecified LSA groups
Omungunda 99/5	Namibia	-18.024922	13.7866528	1705	35	KN-5641	charcoal	unspecified LSA groups [Phase 3: Middle Ceramic LSA]

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Omungunda 99/6	Namibia	-18.024922	13.7866528	1602	29	KIA-22463	charcoal	unspecified LSA groups [Phase 3: Middle Ceramic LSA]
Omungunda 99/7	Namibia	-18.024922	13.7866528	1600	35	KN-5285	charcoal	unspecified LSA groups [Phase 3: Middle Ceramic LSA]
Omungunda 99/8	Namibia	-18.024922	13.7866528	1565	35	KN-5640	charcoal	unspecified LSA groups [Phase 3: Middle Ceramic LSA]
Omungunda 99/9	Namibia	-18.024922	13.7866528	1530	30	KN-5642	charcoal	unspecified LSA groups [Phase 3: Middle Ceramic LSA]
Oruwanje 95/1	Namibia	-18.305131	13.4469889	2527	27	KIA-29258	charcoal	LSA
Oruwanje 95/1	Namibia	-18.305131	13.4469889	2243	39	UtC-5944	charcoal	LSA Early Ceramic
Oruwanje 95/1	Namibia	-18.305131	13.4469889	2208	46	KN-5005	charcoal	LSA Early Ceramic
Oruwanje 95/1	Namibia	-18.305131	13.4469889	2165	35	KN-5304	charcoal	LSA Early Ceramic
Oruwanje 95/1	Namibia	-18.305131	13.4469889	2140	40	KN-5298	charcoal	LSA Early Ceramic
Oruwanje 95/1	Namibia	-18.305131	13.4469889	2005	35	KN-5300	charcoal	LSA Early Ceramic
Oruwanje 95/1	Namibia	-18.305131	13.4469889	1950	35	KN-5303	charcoal	LSA Early Ceramic
Oruwanje 95/1	Namibia	-18.305131	13.4469889	1939	50	KN-4848	charcoal	LSA Early Ceramic
Oruwanje 95/1	Namibia	-18.305131	13.4469889	1907	27	KN-5003	charcoal	LSA Early Ceramic
Oruwanje 95/1	Namibia	-18.305131	13.4469889	1900	40	KN-5302	charcoal	LSA Early Ceramic
Oruwanje 95/1	Namibia	-18.305131	13.4469889	1731	43	KN-4850	charcoal	LSA Middle Ceramic
Oruwanje 95/1	Namibia	-18.305131	13.4469889	1520	32	KN-5297	charcoal	LSA Middle Ceramic
Oruwanje 95/1	Namibia	-18.305131	13.4469889	1511	33	UtC-5938	charcoal	LSA Middle Ceramic
Oruwanje 95/1	Namibia	-18.305131	13.4469889	1419	40	UtC-5947	charcoal	LSA Middle Ceramic

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Oruwanje 95/1	Namibia	-18.305131	13.4469889	1280	28	KN-5004	charcoal	LSA Late Ceramic
Oruwanje 95/1	Namibia	-18.305131	13.4469889	1255	40	UtC-5948	charcoal	LSA Late Ceramic
Oruwanje 95/1	Namibia	-18.305131	13.4469889	1252	36	UtC-5945	bulb scale	LSA Late Ceramic
Oruwanje 95/1	Namibia	-18.305131	13.4469889	1194	32	UtC-5945	soot	LSA Late Ceramic
Oruwanje 95/1	Namibia	-18.305131	13.4469889	1178	32	UtC-5586	seed	LSA Late Ceramic
Oruwanje 95/1	Namibia	-18.305131	13.4469889	1172	32	Utc-5939	charcoal	LSA Late Ceramic
Oruwanje 95/2	Namibia	-18.305131	13.4469889	1120	55	KN-5299	charcoal	LSA Late Ceramic
Oruwanje 95/3	Namibia	-18.305131	13.4469889	530	30	KN-4849	charcoal	Phase 1: Historical
Oruwanje 95/4	Namibia	-18.305131	13.4469889	383	40	KIA-2925]	charcoal	Phase 1: Historical
Otjitati Rock Shelter	Namibia	-18.016667	12.6833333	670	50	Pta-4362	charcoal	Pastoralist
Ovizorom-buku 96/1	Namibia	-17.043094	13.2159722	2465	35	KN-5261	charcoal	Hunter-gatherer
Ovizorom-buku 96/1	Namibia	-17.043094	13.2159722	1525	35	KN-5259	charcoal	unspecified LSA group [Phase 2: Ceramic LSA]
Ovizorom-buku 96/1	Namibia	-17.043094	13.2159722	1042	33	UtC-8103	charcoal	unspecified LSA groups [Phase 2: Ceramic LSA]
Ovizorom-buku 96/2	Namibia	-17.043094	13.2159722	2435	45	KN-5325	charcoal	Hunter-gatherer
Ovizorom-buku 96/2	Namibia	-17.043094	13.2159722	1442	25	KIA-11985	charcoal	unspecified LSA group [Phase 2: Ceramic LSA]
Ovizorom-buku 96/2	Namibia	-17.043094	13.2159722	940	30	KN-5260	wood	unspecified LSA groups [Phase 2: Ceramic LSA]
Ovizorom-buku 96/2	Namibia	-17.043094	13.2159722	420	35	KN-5372	charcoal	unspecified LSA groups [Phase 1: Historical]
Ovizorom-buku 96/3	Namibia	-17.043094	13.2159722	1275	30	KN-5373	charcoal	unspecified LSA group [Phase 2:

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								Ceramic LSA]
Rosh Pinah Shelter	Namibia	-27.883333	16.6833333	760	50	Pta-3521	charcoal	Hunter-gatherer
Ruuga 98/39-1	Namibia	-17.866667	19.5166667	1440	35	KN-5577	charcoal	Metal-working
Ruuga 98-39-2	Namibia	-17.866667	19.5166667	**1602**	**123**	**KIA-28854**	**charcoal extracted from pottery**	Metal-working
Ruuga 98-39-2	Namibia	-17.866667	19.5166667	**1565**	**20**	**KIA-28853**	**charcoal extracted from pottery**	Metal-working
Skorpion Cave	Namibia	-27.8895	16.6456667	1340	60	Beta-160049	charcoal	Hunter-gatherer
Snake Rock	Namibia	-21.2	14.55	1840	50	Pta-2886	charcoal	hunter-gatherers with pottery
Snake Rock	Namibia	-21.2	14.55	1640	70	Wits-1249	charcoal	Hunter-gatherers
Spitzkoppe	Namibia	-21.823411	15.1782833	1240	50	Pta-4635	-	Pastoralist
Striped Giraffe Shelter	Namibia	-21.8	15.7	**370**	**40**	**Pta-2230**	**collagen from sheep skull**	Unspecified
Ururu	Namibia	-20.5	14.05	1000	60	Pta-2664	-	Pastoralist
Wortel	Namibia	-23.05	14.4666667	400	50	Pta-1645	charcoal	Pastoralist
2930DB 48	South Africa	-29.738056	30.9161111	1300	50	Pta-4303	charcoal	Farming
2931 CA174	South Africa	-29.547222	31.1972222	1560	50	Pta-7577	charcoal	Farming
Ai Tomas	South Africa	-28.583333	17.0833333	1980	120	Pta-5530	charred bone	Possible Pastoralist
Ai Tomas	South Africa	-28.583333	17.0833333	420	50	Pta-5458	charcoal	Pastoralist
Ai Tomas	South Africa	-28.583333	17.0833333	330	45	Pta-5452	charcoal	Pastoralist
Anne Shaw Middledrift [MAS]	South Africa	-32.833333	26.9833333	920	50	Pta-838	charcoal	Pastoralist
Atlantic Beach 1	South Africa	-33.863056	18.5088889	1825	15	Pta-7800	marine shell	Pastoralist
Atlantic Beach 1	South Africa	-33.863056	18.5088889	1800	50	Pta-7792	marine shell	Pastoralist
Atlantic Beach 3	South Africa	-33.863056	18.5088889	1490	50	Pta-8797	marine shell	Pastoralist
Bakoond [BK]	South Africa	-33.365022	18.1647694	2800	30	UGAMS-3064	marine shell	LSA
Balerno Main Shelter	South Africa	-22.265	29.1880556	2180	50	Pta-8609	charcoal	LSA
Balerno Main Shelter	South Africa	-22.265	29.1880556	1340	40	Pta-8603	charcoal	Hunter-gatherer with farmer contacts

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Balerno Shelter 3 [Warthog Shelter]	South Africa	-22.286944	29.2036111	2250	40	Pta-7994	charcoal	Hunter-gatherer
Balerno Shelter 3 [Warthog Shelter]	South Africa	-22.286944	29.2036111	1920	45	Pta-7997	charcoal	Hunter-gatherer
Barne's	South Africa	-29.266111	29.5247222	1060	65	OZD446	Crust covering paint	Fine-line painting
Belleview	South Africa	-29.814444	29.1680556	2330	60	Pta-292	charcoal	Hunter-gatherer
Belleview	South Africa	-29.814444	29.1680556	1590	55	Pta-291	charcoal	Hunter-gatherer
Belleview	South Africa	-29.814444	29.1680556	1030	50	Pta-449	charcoal	Hunter-gatherer
Belleview	South Africa	-29.814444	29.1680556	815	35	Pta-448	charcoal	Hunter-gatherer
Bethelsklip	South Africa	-30.372031	17.9469694	800	50	Pta-3512	charcoal	Pastoralist
Bethelsklip	South Africa	-30.372031	17.9469694	360	40	Pta-4741	charcoal	Pastoralist
Biesje Poort 2	South Africa	-28.658917	20.50875	1580	40	Pta-9569	charcoal	Pastoralist [Doornfon-tein]
Biesje Poort 2	South Africa	-28.658917	20.50875	1550	50	Pta-5578	-	Pastoralist [Doornfon-tein]
Biesje Poort 2	South Africa	-28.658917	20.50875	1210	70	Pta-4772	-	Pastoralist [Doornfon-tein]
Biesje Poort 2	South Africa	-28.658917	20.50875	930	40	Pta-9506	-	Pastoralist [Doornfon-tein]
Blackburn	South Africa	-29.686944	31.0952778	900	40	Pta 162	charcoal	Farming
Blinkklipkop [BKK]	South Africa	-28.302778	23.1166667	1150	40	Pta-2835	charcoal	Pastoralist [Doornfon-tein]
Blinkklipkop [BKK]	South Africa	-28.302778	23.1166667	1160	50	Pta-2840	charcoal	Pastoralist [Doornfon-tein]
Bloeddrift 23 [Auchas]	South Africa	-28.350833	16.8011111	355	15	Pta-7942	charcoal	Pastoralist
Blombos Cave [BBC]	South Africa	-34.415764	21.2235944	2340	50	Pta-6247	marine shell	Hunter-gatherer
Blombos Cave [BBC]	South Africa	-34.415764	21.2235944	**1960**	**50**	**OxA-4543**	**sheep bone**	Herder
Blombos Cave [BBC]	South Africa	-34.415764	21.2235944	**1880**	**55**	**OxA-4544**	**sheep bone**	Herder

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Blombos-fontein 7 [BBF7]	South Africa	-34.415083	21.2200361	3170	25	Pta-6183	marine shell	LSA
Blombos-fontein 7 [BBF7]	South Africa	-34.415083	21.2200361	3110	50	Pta-6179	marine shell	LSA
Blombos-fontein 9 [BBF9]	South Africa	-34.414697	21.2200361	480	45	Pta-6187	charcoal	unspecified LSA groups
Blombos-fontein 9 [BBF9]	South Africa	-34.414697	21.2200361	940	50	Pta-6248	marine shell	unspecified LSA groups
Bloubos 5	South Africa	-28.133333	20.8	1810	45	Pta-7381	OES	LSA
Blydefon-tein	South Africa	-31.25	25.1	2728	32	D-AMS-1231	bone	Hunter-gatherer
Blydefon-tein	South Africa	-31.25	25.1	2292	117	SMU-1853	charcoal	Hunter-gatherer
Blydefon-tein	South Africa	-31.25	25.1	**1810**	**50**	**GrA-15192**	**fibre ceramic**	Hunter-gatherer with pottery
Blydefon-tein	South Africa	-31.25	25.1	1305	31	SMU-1850	charcoal	Hunter-gatherer with pottery
Blydefon-tein	South Africa	-31.25	25.1	**1505**	**50**	**GrA-15195**	**fibre ceramic**	Hunter-gatherer with pottery
Blydefon-tein	South Africa	-31.25	25.1	1238	28	D-AMS-1228	bone	Hunter-gatherer with pottery
Blydefon-tein	South Africa	-31.25	25.1	1255	109	MSU-1925	charcoal	Hunter-gatherer with pottery
Blydefon-tein	South Africa	-31.25	25.1	1305	31	SMU-1850	charcoal	Hunter-gatherer with pottery
Blydefon-tein	South Africa	-31.25	25.1	**1097**	**24**	**OxA-27366**	**DNA tested bone [sheep]**	Hunter-gatherer-stock-keepers
Blydefon-tein	South Africa	-31.25	25.1	844	19	SMU-1902	charcoal	Hunter-gatherer-stock-keepers
Blydefon-tein	South Africa	-31.25	25.1	556	14	D-AMS-1227	bone	Hunter-gatherer-stock-keepers
Blydefon-tein	South Africa	-31.25	25.1	758	29	D-AMS-1230	bone	Hunter-gatherer-stock-keepers

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Blydefon-tein	South Africa	-31.25	25.1	819	30	D-AMS-1229	bone	Hunter-gatherer-stock-keepers
Blydefon-tein	South Africa	-31.25	25.1	**785**	**50**	**GrA-15193**	**fibre ceramic**	Hunter-gatherer-stock-keepers
Bokvasmaak 3	South Africa	-28.404158	20.1637806	1620	35	Pta-4877	OES	Herder
Bonawe Rock Shelter	South Africa	-31.343611	27.775	2250	80	Pta-1711	charcoal	Hunter-gatherer
Bonteberg Shelter	South Africa	-34.2	18.3833333	2050	95	SR-166	marine shell	Hunter-gatherer
Boomplaas	South Africa	-33.383333	22.1833333	1700	55	UW-338	charcoal	Hunter-gatherer-livestock-keepers
Boomplaas	South Africa	-33.383333	22.1833333	1630	50	UW-337	charcoal	Hunter-gatherer-livestock-keepers
Boomplaas	South Africa	-33.383333	22.1833333	1510	75	Uw-307	charcoal	Hunter-gatherer-livestock-keepers
Borchers Shelter	South Africa	-30.702778	30.2822222	2070	50	Pta-3108	charcoal	Hunter-gatherer
Border Cave	South Africa	-27.025	31.98925	2010	50	Pta-506	vegetation	Hunter-gatherer
Boundary	South Africa	-31.533333	24.1333333	**2160**	**50**	**GrA-13564**	**fibre in pottery**	Hunter-gatherer
Broeder-stroom	South Africa	-25.75	27.8333333	1600	50	KN-2645	-	Farming
Broeder-stroom	South Africa	-25.75	27.8333333	1520	110	RL-351	-	Farming
Broeder-stroom	South Africa	-25.75	27.8333333	1570	65	KN-2644	-	Farming
Broeder-stroom	South Africa	-25.75	27.8333333	1450	100	Fra-82	-	Farming
Broeder-stroom	South Africa	-25.75	27.8333333	1540	40	Pta-1375	-	Farming
Broeder-stroom	South Africa	-25.75	27.8333333	1530	50	Wits-871	-	Farming
Broeder-stroom	South Africa	-25.75	27.8333333	1490	50	UCLA-1791B	-	Farming
Broeder-stroom	South Africa	-25.75	27.8333333	1440	50	Wits-870	-	Farming
Broeder-stroom	South Africa	-25.75	27.8333333	1350	80	KN-2641	-	Farming
Broeder-stroom	South Africa	-25.75	27.8333333	1320	100	Fra-88	-	Farming

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Broeder-stroom	South Africa	-25.75	27.8333333	1335	60	Wits-1475	-	Farming
Buitensfon-tein 95 [BUI95]	South Africa	-31.606861	24.0356389	**480**	**60**	**Pta-6156**	**pottery (fibre)**	Hunter-gatherer-stock-keepers
Buzz Shelter	South Africa	-31.523611	18.6002778	1921	25	OxA-24515	bone	Hunter-gatherer
Byneskrans-kop	South Africa	-34.583333	19.4666667	**1370**	**60**	**OxA-3863**	**sheep bone**	Pastoralist?
Clarke's Shelter	South Africa	-29.020833	29.3161111	2160	50	Pta-2971	charcoal	Hunter-gatherer
Clarke's Shelter	South Africa	-29.020833	29.3161111	2380	50	Pta-3247	-	Hunter-gatherer
Clarke's Shelter	South Africa	-29.020833	29.3161111	1580	50	Pta-2973	charcoal	Hunter-gatherer
Collingham Shelter	South Africa	-29.459722	29.7958333	1830	50	Pta-5098	charcoal	Hunter-gatherer
Collingham Shelter	South Africa	-29.459722	29.7958333	1880	45	Pta-5101	charcoal	Hunter-gatherer
Collingham Shelter	South Africa	-29.459722	29.7958333	1770	50	Pta-5274	charcoal	Hunter-gatherer
Collingham Shelter	South Africa	-29.459722	29.7958333	1810	60	Pta-5265	charcoal	Hunter-gatherer
Collingham Shelter	South Africa	-29.459722	29.7958333	1260	50	Pta-5408	charcoal	Hunter-gatherer
Collingham Shelter	South Africa	-29.459722	29.7958333	650	50	Pta-5092	wood	Hunter-gatherer
Colwinton	South Africa	-31.129167	27.7394444	1890	45	Pta-2549	charcoal	Hunter-gatherer
Connies Limpet Bar (CLB)	South Africa	-32.316667	18.3333333	390	40	Pta-4020	charcoal	Hunter-gatherer
De Hangen	South Africa	-32.083333	18.8666667	485	45	Pta-168	charcoal	Hunter-gatherer
De Hangen	South Africa	-32.083333	18.8666667	380	45	Pta-125	charcoal	Hunter-gatherer
Deurspring 16 [DSP16]	South Africa	-32.013333	18.2954917	2760	45	Pta-7129	marine shell	LSA
Diamant	South Africa	-24.262222	27.5905556	1250	45	Pta-5216	-	Farming
Diamant	South Africa	-24.262222	27.5905556	1240	50	Pta-3620	-	Farming
Diamond 1	South Africa	-28.492222	28.9477778	2810	60	Pta-2977	-	Hunter-gatherer
Die Kelders [DK1]	South Africa	-34.535556	19.3758333	1960	85	GX-1688	charcoal	Hunter-gatherer-fishers
Die Kelders [DK1]	South Africa	-34.535556	19.3758333	1960	95	GX-1689	charcoal	Hunter-gatherer-fishers

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Die Kelders [DK1]	South Africa	-34.535556	19.3758333	1480	55	UW-291	charcoal	Hunter-gatherer-fishers
Die Kelders [DK1]	South Africa	-34.535556	19.3758333	1590	80	GaK-3956	charcoal	Hunter-gatherer-fishers
Die Kelders [DK1]	South Africa	-34.535556	19.3758333	1465	100	GX-1685	charcoal	Hunter-gatherer-fishers
Die Kelders [DK1]	South Africa	-34.535556	19.3758333	**1325**	**60**	**OxA-3860**	**sheep bone**	Hunter-gatherer-fishers and possibly pastoralist
Die Kelders [DK1]	South Africa	-34.535556	19.3758333	**1290**	**60**	**OxA-3961**	**sheep bone**	Hunter-gatherer-fishers and possibly pastoralist
Diepkloof Rock Shelter	South Africa	-32.391397	18.457625	1050	85	GaK-4597	charcoal	Hunter-gatherer
Diepkloof Rock Shelter	South Africa	-32.391397	18.457625	900	50	Pta-1056	charcoal	Hunter-gatherer
Diepkloof Rock Shelter	South Africa	-32.391397	18.457625	390	30	Pta-1055	charcoal	Hunter-gatherer
Diepkloof Rock Shelter	South Africa	-32.391397	18.457625	1590	45	GaK-4595	charcoal	Hunter-gatherer mix pastoralist
Dikbosch [Area B]	South Africa	-28.652222	23.9025	1720	40	Pta-3413	charcoal	Pastoralist [Doornfon-tein]
Dikbosch [Area B]	South Africa	-28.652222	23.9025	1570	40	Pta-3412	charcoal	Pastoralist [Doornfon-tein]
Doornfon-tein 1	South Africa	-28.205556	23.0333333	1120	40	Pta-187	charcoal	Pastoralist [Doornfon-tein]
DP2004/010	South Africa	-29.598528	17.0305	712	24	OxA-24078	charcoal	Group 2
DP2004-014	South Africa	-29.599667	17.0495	1020	60	GX-32060	marine shell	Group 2 and Group 3
Drie Susters Main [DSM]	South Africa	-33.100833	18.0005556	1050	60	Pta-5478	charcoal	Pastoralist
Driel Shelter	South Africa	-28.764167	29.2902778	1775	40	Pta-1381	charcoal	Hunter-gatherer
Droegrond	South Africa	-29.123333	20.26	400	120	Pta-2396	charcoal	Pastoralist
Duiker Eiland	South Africa	-32.716667	17.9166667	1700	50	Pta-1581	marine shell	Hunter-gatherer

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Dunefield Midden 1 [DFM1]	South Africa	-32.301361	18.3483333	600	40	Pta-5277	charcoal	Mixed Hunter-gatherer/ Pastoralist
Dunefield Midden 1 [DFM1]	South Africa	-32.301361	18.3483333	620	50	Pta-5276	charcoal	Mixed Hunter-gatherer/ Pastoralist
Dunefield Midden 1 [DFM1]	South Africa	-32.301361	18.3483333	640	40	Pta-5062	charcoal	Mixed Hunter-gatherer/ Pastoralist
Dunefield Midden 1 [DFM1]	South Africa	-32.301361	18.3483333	650	50	Pta5280	charcoal	Mixed Hunter-gatherer/ Pastoralist
Dunefield Midden 1 [DFM1]	South Africa	-32.301361	18.3483333	680	50	Pta-4082	charcoal	Mixed Hunter-gatherer/ Pastoralist
Dunefield Midden 1 [DFM1]	South Africa	-32.301361	18.3483333	710	45	Pta-4799	charcoal	Mixed Hunter-gatherer/ Pastoralist
Dunefield Midden 1 [DFM1]	South Africa	-32.301361	18.3483333	1130	40	Pta-5070	marine shell	Mixed Hunter-gatherer/ Pastoralist
Dunefield Midden 1 [DFM1]	South Africa	-32.301361	18.3483333	1140	40	Pta-5011	marine shell	Mixed Hunter-gatherer/ Pastoralist
Dunefield Midden 1 [DFM1]	South Africa	-32.301361	18.3483333	580	50	Pta-5061	charcoal	Mixed Hunter-gatherer/ Pastoralist
Dunefield Midden 1 [DFM1]	South Africa	-32.301361	18.3483333	510	40	Pta-4807	charcoal	Mixed Hunter-gatherer/ Pastoralist
Dunefield Midden 1 [DFM1]	South Africa	-32.301361	18.3483333	1240	40	Pta-5031	marine shell	Mixed Hunter-gatherer/ Pastoralist
Dunefield Midden 1 [DFM1]	South Africa	-32.301361	18.3483333	1350	70	Pta-4801	marine shell	Mixed Hunter-gatherer/ Pastoralist
Edgehill	South Africa	-32.890833	26.4133333	1830	60	Pta-3564	charcoal	LSA
Eiland Salt Works	South Africa	-23.655556	30.6772222	1460	40	Wits 764	-	Farming

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Eiland Salt Works	South Africa	-23.655556	30.6772222	1680	40	Pta-1524	-	Farming
Eland Cave 1 & 2	South Africa	-32.051389	19.0219444	2145	50	OxA-6217	human bone	Hunter-gatherer
Elands Bay Cave	South Africa	-32.310019	18.3520028	2190	25	Pta-5820	charcoal	LSA
Elands Bay Cave	South Africa	-32.310019	18.3520028	2100	20	-	-	Hunter-gatherer/ pastoralist or hunters-with-sheep
Elands Bay Cave	South Africa	-32.310019	18.3520028	1790	50	-	-	Hunter-gatherer/ pastoralist or hunters-with-sheep
Elands Bay Cave	South Africa	-32.310019	18.3520028	1680	40	Pta-5815	charcoal	Hunters-with-sheep or pastoralist
Elands Bay Cave	South Africa	-32.310019	18.3520028	1520	80	GaK-4337	charcoal	Hunters-with-sheep or pastoralist
Elands Bay Cave	South Africa	-32.310019	18.3520028	1400	50	-	-	Hunters-with-sheep or pastoralist
Elands Bay Cave	South Africa	-32.310019	18.3520028	1350	20	-	-	Hunters-with-sheep or pastoralist
Elands Bay Cave	South Africa	-32.310019	18.3520028	1310	40	-	-	Hunters-with-sheep or pastoralist
Elands Bay Cave	South Africa	-32.310019	18.3520028	1280	50	Pta-5819	charcoal	Hunters-with-sheep or pastoralist
Elands Bay Cave	South Africa	-32.310019	18.3520028	1120	85	GaK-4335	charcoal	Hunters-with-sheep/ Pastoralist/ Strandloper
Elands Bay Cave	South Africa	-32.310019	18.3520028	1040	50	-	-	Hunters-with-sheep/ Pastoralist/ Strandloper
Elands Bay Cave	South Africa	-32.310019	18.3520028	500	45	Pta-5813	charcoal	Hunters-with-sheep/ Pastoralist/ Strandloper

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Elands Bay Cave	South Africa	-32.310019	18.3520028	320	50	Pta-1815	charcoal	Hunters-with-sheep/ Pastoralist/ Strandloper
Emberton Way	South Africa	-29.539444	31.22	1270	60	Pta 2881	charcoal	Farming
Emberton Way	South Africa	-29.539444	31.22	1130	40	Pta 2880	charcoal	Farming
Emberton Way	South Africa	-29.539444	31.22	1050	60	Pta 2879	charcoal	Farming
Enkwazini	South Africa	-28.182222	32.5108333	1650	50	Pta-1847	charcoal	Farming
Enkwazini	South Africa	-28.182222	32.5108333	1540	60	Pta-1977	charcoal	Farming
Esikolweni	South Africa	-28.9525	29.2733333	330	90	OZB127U	Plant fibre in paint	Fine-line painting
Faraoskop Rock Shelter	South Africa	-32.125278	18.6144444	670	50	Pta-4811	charcoal	Hunter-gatherer
Geelbeck Dunes [NORA]	South Africa	-33.188647	18.1589167	2580	25	KIA-17755	OES small bead preform	LSA
Geelbeck Dunes [POTTERY]	South Africa	-33.188647	18.1589167	2500	25	KIA-17761	OES small bead	LSA
Geelbeck Dunes [SHELLY]	South Africa	-33.188647	18.1589167	2465	25	KIA-17757	small oes bead	LSA
Gehle Shelter	South Africa	-29.129722	29.5727778	1280	50	Pta-3242	charcoal	Hunter-gatherer
Gehle Shelter	South Africa	-29.129722	29.5727778	750	50	Pta-3243	charcoal	Hunter-gatherer
Glen Elliot Shelter	South Africa	-30.776667	25.6333333	1120	70	Pta-3402/75	charcoal	Hunter-gatherer-stock-keepers
Goergap 113 [KR}	South Africa	-24.113889	28.4708333	720	50	Pta-5507	charcoal	Hunter-gatherer contact with farmers
Goergap 113 [KR}	South Africa	-24.113889	28.4708333	600	50	Pta-5213	charcoal	Hunter-gatherer contact with farmers
Goergap 113 [KR}	South Africa	-24.113889	28.4708333	540	50	Pta-5510	charcoal	Hunter-gatherer contact with farmers
Goergap 113 [KR}	South Africa	-24.113889	28.4708333	380	50	Pta-5511	charcoal	Hunter-gatherer contact with farmers

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Good Hope Shelter	South Africa	-29.656111	29.4272222	2160	40	Pta-838	charcoal	Hunter-gatherer
Grootdrink	South Africa	-28.566667	21.75	295	32	Pta-360	soot from pot	-
Grootrif G [GFG]	South Africa	-32.166667	18.3122222	690	40	Pta-4070	charcoal	Hunter-gatherer
Haaskraal	South Africa	-31.55	24.2333333	1880	70	SMU-1789	charcoal	Hunter-gatherer [interior Wilton]
Haaskraal	South Africa	-31.55	24.2333333	**1970**	**50**	**GrA-13541**	**fibre in pottery**	Hunter-gatherer [interior Wilton]
Haaskraal	South Africa	-31.55	24.2333333	**1920**	**130**	**GrA-13557**	**fibre in pottery**	Hunter-gatherer [interior Wilton]
Haaskraal	South Africa	-31.55	24.2333333	1850	45	SMU-1635	charcoal	Hunter-gatherer [interior Wilton]
Haaskraal	South Africa	-31.55	24.2333333	**1570**	**50**	**GrA-13542**	**fibre in pottery**	Hunter-gatherer and pastoralist [part of Phase 1]
Haaskraal	South Africa	-31.55	24.2333333	**1400**	**50**	**GrA-13540**	**fibre in pottery**	Hunter-gatherer and pastoralist [part of Phase 1]
Haaskraal	South Africa	-31.55	24.2333333	1180	70	SMU-1789	charcoal	Hunter-gatherer and pastoralist [part of Phase 1]
Haaskraal	South Africa	-31.55	24.2333333	1140	60	SMU-1790	charcoal	Hunter-gatherer and pastoralist [part of Phase 1]
Haaskraal	South Africa	-31.55	24.2333333	545	45	SMU-1636	charcoal	Hunter-gatherers with livestock [Phase 2]
Haaskraal	South Africa	-31.55	24.2333333	544	43	SMU-1636	charcoal	Hunter-gatherers with livestock [Phase 2]
Haaskraal	South Africa	-31.55	24.2333333	**315**	**65**	**OxA-4395**	**bos tooth**	Hunter-gatherers

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								with livestock [Phase 2]
Haaskraal	South Africa	-31.55	24.2333333	**410**	**65**	**OxA-4395**	**sheep bone**	Hunter-gatherers with livestock [Phase 2]
Haaskraal	South Africa	-31.55	24.2333333	**300**	**40**	**AMS-61147**	**bos bone**	Hunter-gatherers with livestock [Phase 2]
Happy Rest	South Africa	-25.017778	29.7238889	1600	45	Pta-2421	-	Farming
Happy Rest	South Africa	-25.017778	29.7238889	1480	50	Pta-2414	-	Farming
Havens Cave	South Africa	-33.683333	24.5666667	1280	50	Pta-4610	charcoal	Hunter-gatherer
Hawston	South Africa	-34.407939	19.15885	1900	40	Pta-835	charcoal	Strandloper
Hawston	South Africa	-34.407939	19.15885	1860	60	Pta-834	charcoal	Strandloper
Heuningklip	South Africa	-32.878333	18.0116667	760	50	Pta-4167	charcoal	Pastoralist
Highmoor	South Africa	-29.318333	29.6272222	2310	70	OZD450	Crust underlying paint	Fine-line painting
iGujwana	South Africa	-28.93	29.9866667	390	50	Pta 8101	wooden stub	Farming
Inanda Quarry	South Africa	-29.753333	30.9141667	1580	50	Pta-5492	charcoal	Farming
iNkolimah-ashi Shelter	South Africa	-28.794167	30.1805556	1600	50	Pta-7231	charcoal	Hunter-gatherer with farmer contacts
iNkolimaha-shi Shelter	South Africa	-28.794167	30.1805556	1580	50	Pta-7230	charcoal	Hunter-gatherer with farmer contacts
iNkolimaha-shi Shelter	South Africa	-28.794167	30.1805556	1170	50	Pta-7229	charcoal	Hunter-gatherer with farmer contacts
iNkolimaha-shi Shelter	South Africa	-28.794167	30.1805556	550	45	Pta-7459	charcoal	Hunter-gatherer contact with farmers
iNkolimaha-shi Shelter	South Africa	-28.794167	30.1805556	2520	50	Pta-7232	charcoal	Hunter-gatherer
iNkolimaha-shi Shelter	South Africa	-28.794167	30.1805556	1990	60	Pta-7384	-	Hunter-gatherer

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Site Name	*Country*	*Latitude*	*Longitude*	*uncal. Radiocarbon determination or AMS date*	*SD*	*Lab Code*	*Type of material Dated*	*Broad subsistence category*
Jagt Pan 7	South Africa	-30.659283	22.0868167	2550	60	Pta-4193	OES	Hunter-gatherer
Jagt Pan 7	South Africa	-30.659283	22.0868167	2360	60	Pta-4309	OES	Hunter-gatherer
Jagt Pan 7	South Africa	-30.659283	22.0868167	1610	50	Pta-4300	OES	Hunter-herder
Jakkalsberg A JKBA	South Africa	-28.180556	16.8875	1330	60	Pta-5958	charcoal	Pastoralist
Jakkalsberg A JKBA	South Africa	-28.180556	16.8875	1300	25	Pta-6100	charcoal	Pastoralist
Jakkalsberg B JKBB	South Africa	-28.180556	16.8875	1420	25	Pta-6122	charcoal	Pastoralist
Jakkalsberg B JKBB	South Africa	-28.180556	16.8875	1380	50	Pta-6101	charcoal	Pastoralist
Jakkalsberg M	South Africa	-28.180694	16.8869444	1740	75	GX-32760	OES	Hunter-herder
Jubilee Shelter	South Africa	-25.691667	27.9133333	1840	50	Wits-1398	charcoal	Hunter-gatherer with pottery [Bambata Ware]
Jubilee Shelter	South Africa	-25.691667	27.9133333	1350	120	Wits-1399	charcoal	Hunter-gatherer with farmer contacts
Kablejous River Mouth 1A (KR/SM1A)	South Africa	-34.005653	24.9339361	1560	40	-	charcoal	Pastoralist
Kasteelberg A [KBA]	South Africa	-32.795753	17.9675944	1860	60	Pta-3711	charcoal	Herders [Smith 2006], Hunters-with-sheep or hunter-gatherer [c. 1800 BP deposits] [Sadr 2008]
Kasteelberg A [KBA]	South Africa	-32.795753	17.9675944	1790	40	Pta-3461	charcoal	Herders [Smith 2006], Hunters-with-sheep or hunter-gatherer [c. 1800 BP deposits] [Sadr 2008]
Kasteelberg A [KBA]	South Africa	-32.795753	17.9675944	1230	40	Pta-5937	charcoal	Pastoralist
Kasteelberg A [KBA]	South Africa	-32.795753	17.9675944	**1630**	**60**	**OxA-3864**	**sheep bone**	Pastoralist

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Kasteelberg A [KBA]	South Africa	-32.795753	17.9675944	**1430**	**55**	**OxA-3865**	**sheep bone**	Pastoralist
Kasteelberg A [KBA]	South Africa	-32.795753	17.9675944	970	50	Pta-4336	charcoal	Pastoralist
Kasteelberg B [KBB]	South Africa	-32.795753	17.9675944	1220	45	Pta-3998	charcoal	Pastoralist
Kasteelberg B [KBB]	South Africa	-32.795753	17.9675944	1300	60	Pta-3995	charcoal	Pastoralist
Kasteelberg B [KBB]	South Africa	-32.795753	17.9675944	1200	45	Pta-3994	charcoal	Pastoralist
Kasteelberg B [KBB]	South Africa	-32.795753	17.9675944	1310	50	Pta-4373	charcoal	Pastoralist
Kasteelberg B [KBB]	South Africa	-32.795753	17.9675944	920	40	Pta-3742	charcoal	Pastoralist
Kasteelberg B [KBB]	South Africa	-32.795753	17.9675944	880	50	Pta-3747	charcoal	Pastoralist
Kasteelberg B [KBB]	South Africa	-32.795753	17.9675944	910	50	Pta-3787	charcoal	Pastoralist
Kasteelberg B [KBB]	South Africa	-32.795753	17.9675944	990	35	Pta-4500	charcoal	Pastoralist
Kasteelberg C [KBC]	South Africa	-32.795753	17.9675944	1270	50	Pta-3785	charcoal	Hunter-gatherer
KBD	South Africa	-32.795753	17.9675944	1780	70	Pta-9134	marine shell	Pastoralist
KBD	South Africa	-32.795753	17.9675944	1730	50	Pta-9076	marine shell	Pastoralist
KBDe	South Africa	-32.795753	17.9675944	1760	50	Pta-8095	marine shell	Pastoralist
KBDe	South Africa	-32.795753	17.9675944	1650	60	Pta-8093	marine shell	Pastoralist
KBDe	South Africa	-32.795753	17.9675944	1690	50	Pta-8092	marine shell	Pastoralist
KBDe	South Africa	-32.795753	17.9675944	1690	50	Pta-8091	marine shell	Pastoralist
KBDe	South Africa	-32.795753	17.9675944	1570	50	Pta-8090	marine shell	Pastoralist
KBDe	South Africa	-32.795753	17.9675944	1550	50	Pta-8094	marine shell	Pastoralist
KBE	South Africa	-32.795753	17.9675944	1670	60	-	charcoal	Pastoralist
KBE	South Africa	-32.795753	17.9675944	1360	50	Pta-7455	charcoal	Pastoralist
KBE	South Africa	-32.795753	17.9675944	1800	50	Pta-9107	marine shell	Pastoralist
Khartoum 1	South Africa	-29.266667	24.75	570	60	Pta-3093	charcoal	Hunter-gatherer-stock-keepers
KK002	South Africa	-31.242472	18.0516111	1462	24	OxA-25349	bone	unspecified LSA groups
Klasies River Cave 1 [KRM1]	South Africa	-34.1	24.4	2795	85	GX-0971	charcoal	LSA

Appendix 1:

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Site Name	*Country*	*Latitude*	*Longitude*	*uncal. Radiocarbon determination or AMS date*	*SD*	*Lab Code*	*Type of material Dated*	*Broad subsistence category*
Klasies River Cave 1 [KRM1]	South Africa	-34.1	24.4	2525	85	GX-0969	charcoal	LSA
Klein Afrika	South Africa	-22.833333	29.9166667	1630	45	Pta-1168	-	Farming
Klein Afrika	South Africa	-22.833333	29.9166667	1540	50	Pta-2415	-	Farming
Klein Afrika	South Africa	-22.833333	29.9166667	1450	45	Pta-1321	-	Farming
Klein Afrika	South Africa	-22.833333	29.9166667	1430	40	Pta-1320	-	Farming
Klein Afrika	South Africa	-22.833333	29.9166667	1410	50	Pta-2420	-	Farming
Klein Kliphuis [KKH]	South Africa	-32.116667	18.85	1990	50	Pta-4671	charcoal	Hunter-gatherer
Klein Kliphuis [KKH]	South Africa	-32.116667	18.85	1230	50	Pta-4672	charcoal	Hunter-gatherer with pottery
KN2004/012	South Africa	-30.235972	17.2501667	1579	24	OxA-22977	charcoal	unspecified LSA groups [Group 2]
KN2004/015E	South Africa	-30.235944	17.2493056	973	24	OxA-22930	bone	LSA
KN2005/041.	South Africa	-30.235111	17.25	1631	23	OxA-22979	charcoal	unspecified LSA groups with cattle
KN2005/041.	South Africa	-30.235111	17.25	**1625**	**25**	**OxA-22933**	**bos taurus**	unspecified LSA groups with cattle
KN2005/054	South Africa	-30.236917	17.24975	1598	25	OxA-22932	bone	unspecified LSA groups [Group 3]
KN2005/067.	South Africa	-30.239611	17.2509167	354	23	OxA-24521	bone	Group 2 and Group 3
KN2005/067.	South Africa	-30.239611	17.2509167	321	23	OxA-24518	bone	Group 2 and Group 3
KN2005/135A	South Africa	-30.234861	17.248	2523	27	OxA-22924	bone	LSA
Kreeftebaai [KTB]	South Africa	-33.134444	17.9847222	970	50	Pta-5517	charcoal	unspecified LSA groups
Kulubele	South Africa	-32.347858	27.7961222	1250	40	Pta-5865	charcoal	Farming
KwaGanda-ganda	South Africa	-29.678611	30.8361111	1395	60	Wits-1918	-	Farming
KwaGanda-ganda	South Africa	-29.678611	30.8361111	1260	60	Wits-1937	-	Farming
KwaGanda-ganda	South Africa	-29.678611	30.8361111	1245	60	Wits-1919	-	Farming
KwaGanda-ganda	South Africa	-29.678611	30.8361111	1080	60	Wits-1920	-	Farming
KwaThwal-eyakhe	South Africa	-28.913611	30.4436111	1290	50	Pta-5350	charcoal	Hunter-gatherer

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Site Name	*Country*	*Latitude*	*Longitude*	*uncal. Radiocarbon determination or AMS date*	*SD*	*Lab Code*	*Type of material Dated*	*Broad subsistence category*
Shelter								contact with farmers
KwaThwal-eyakhe Shelter	South Africa	-28.913611	30.4436111	2640	50	-	charcoal	Hunter-gatherer
Le6	South Africa	-24.043611	31.6711111	1160	50	Pta-3491	-	Farming
Le7a	South Africa	-24.052944	31.6725	1120	50	Pta-3478	-	Farming
Lebalelo	South Africa	-24.570306	30.1595833	1300	50	Pta-8772	charcoal	Farming
Leholamogoa [LMG]	South Africa	-23.267778	28.8255556	2160	60	Beta-236645	charcoal	Hunter-gatherer
Leholamogoa [LMG]	South Africa	-23.267778	28.8255556	2130	40	Beta-236644	charcoal	Hunter-gatherer
Limerock 1	South Africa	-28.550278	24.1333333	1620	50	Pta-1621	charcoal	Pastoralist
Limerock 2	South Africa	-28.550278	24.1333333	1720	40	Pta-2095	charcoal	Pastoralist
Limerock 2	South Africa	-28.550278	24.1333333	1430	50	Pta-1759	charcoal	Pastoralist
Little Witkrans	South Africa	-27.661111	24.6125	1490	40	Pta-2447	charcoal	Pastoralist
Lydenburg Heads Sit	south Africa	-25.105556	30.4944444	1410	50	Pta-1634	charcoal	Farming
Lydenburg Heads Sit	South Africa	-25.105556	30.4944444	1460	50	Pta-328	charcoal	Farming
Ma38	south Africa	-24.041111	31.5034389	1480	50	Pta-3725	-	Farming
Magogo	South Africa	-28.983333	30.3936111	1360	50	Pta-2874	charcoal	Farming
Magogo	South Africa	-28.983333	30.3936111	1320	50	Pta-3716	charcoal	Farming
Magogo	South Africa	-28.983333	30.3936111	1190	50	Pta-2875	charcoal	Farming
Main Caves North	South Africa	-29.279444	29.515	2760	75	OZD448	Crust underlying paint	Fine-line painting
Main Caves North	South Africa	-29.279444	29.515	2360	70	OZD449	Crust underlying paint	Fine-line painting
Mamba	South Africa	-28.943056	31.0472222	1390	50	Pta-4093	charcoal	Farmer
Mamba	South Africa	-28.943056	31.0472222	1320	50	Pta-3716	-	Farming
Mamba	South Africa	-28.943056	31.0472222	1170	60	Pta-4164	bone collagen	Farming
MB2005/001E	South Africa	-30.468722	17.3607222	2796	27	OXA-24554	bone	LSA
MB2005/001E	South Africa	-30.468722	17.3607222	2190	27	Oxa-24552	bone	LSA
MB2005/001E	South Africa	-30.468722	17.3607222	2176	27	OxA-24553	bone	LSA

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MB2005/013	South Africa	-30.464694	17.3612778	717	25	OxA-24555	bone	Hunter-gatherer [Group 1]
Mbabane Shelter	South Africa	-28.755556	30.3741667	500	50	Pta-3684	charcoal	Hunter-gatherer contact with farmers
Mbabane Shelter	South Africa	-28.755556	30.3741667	470	40	Pta-3848	charcoal	Hunter-gatherer contact with farmers
Mbabane Shelter	South Africa	-28.755556	30.3741667	1520	50	Pta-3678	charcoal	Hunter-gatherer contact with farmers
Melkhout-boom Cave	South Africa	-33.316667	25.2833333	2870	90	Pta-706	charcoal	LSA
Melkhout-boom Cave	South Africa	-33.316667	25.2833333	250	0	Gak-1537	charcoal	Hunter-gatherer
Mgede Shelter	South Africa	-28.17	29.6872222	820	50	Pta-3664	charcoal	Hunter-gatherer contact with farmers
Mhlanga Lagoon	South Africa	-29.702778	31.1005556	1080	70	charcoal	Pta 3268	Farming
Mhlopeni	South Africa	-29.009722	30.4125	1400	50	Pta-2878	charcoal	Farming
Mhlwazini Cave	South Africa	-29.047778	29.3897222	2570	60	Pta-5045	charcoal	Hunter-gatherer
Mhlwazini Cave	South Africa	-29.047778	29.3897222	2280	50	Pta-4868	charcoal	Hunter-gatherer
Mhlwazini Cave	South Africa	-29.047778	29.3897222	850	50	Pta-4864	charcoal	Hunter-gatherer contact with farmers
Mhlwazini Cave	South Africa	-29.047778	29.3897222	320	40	Pta-4850	charcoal	Hunter-gatherer contact with farmers
Mike's Taylor Midden	South Africa	-32.335	18.3166667	2820	50	Pta-3720	charcoal	LSA
Mike's Taylor Midden	South Africa	-32.335	18.3166667	2460	50	Pta-3207	charcoal	LSA
Mike's Taylor Midden	South Africa	-32.335	18.3166667	2270	25	Pta-7013	marine shell	LSA
Mike's Taylor Midden	South Africa	-32.335	18.3166667	2340	60	Pta-6693	marine shell	LSA

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Mike's Taylor Midden	South Africa	-32.335	18.3166667	2220	60	Pta-6694	marine shell	LSA
Mike's Taylor Midden	South Africa	-32.335	18.3166667	2160	50	Pta-6707	marine shell	Hunter-gatherer marine exploitation camp site.
Mike's Taylor Midden	South Africa	-32.335	18.3166667	2100	30	Pta-6683	marine shell	Hunter-gatherer marine exploitation camp site.
Mike's Taylor Midden	South Africa	-32.335	18.3166667	2130	50	Pta-3641	charcoal	Hunter-gatherer marine exploitation camp site.
Mike's Taylor Midden	South Africa	-32.335	18.3166667	2090	50	Pta-3659	charcoal	Hunter-gatherer marine exploitation camp site.
Mike's Taylor Midden	South Africa	-32.335	18.3166667	2070	25	Pta-6705	marine shell	Hunter-gatherer marine exploitation camp site.
Mike's Taylor Midden	South Africa	-32.335	18.3166667	2000	25	Pta-6690	marine shell	Hunter-gatherer marine exploitation camp site.
Mike's Taylor Midden	South Africa	-32.335	18.3166667	1780	60	Pta-3640	charcoal	Hunter-gatherer marine exploitation camp site.
Mike's Taylor Midden	South Africa	-32.335	18.3166667	1735	30	Pta-6698	marine shell	Hunter-gatherer marine exploitation camp site.
Moor Park Nature Reserve	South Africa	-29.073611	29.8016667	750	50	Pta 849	-	Farming
Moor Park Nature Reserve	South Africa	-29.073611	29.8016667	660	50	Pta 850	-	Farming
Moor Park Nature Reserve	South Africa	-29.073611	29.8016667	600	50	Pta 853	-	Farming
Mpambony-oni	South Africa	-30.289167	30.7361111	930	50	Pta 2528	charcoal	Farming

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Site Name	*Country*	*Latitude*	*Longitude*	*uncal. Radiocarbon determination or AMS date*	*SD*	*Lab Code*	*Type of material Dated*	*Broad subsistence category*
Mpambony-oni	South Africa	-30.289167	30.7361111	980	50	Pta 2527	charcoal	Farming
Mpambony-oni	South Africa	-30.289167	30.7361111	885	50	Pta 2534	charcoal	Farming
Mpame	South Africa	-32.1	29.05	1340	60	Pta-2019	-	Farming
Mpame	South Africa	-32.1	29.05	1230	40	Pta-2045	-	Farming
Msuluzi Confluence	South Africa	-28.755556	30.1458333	1310	40	Pta-2195	charcoal	Farming
Msuluzi Confluence	South Africa	-28.755556	30.1458333	1370	30	Pta-2193	charcoal	Farming
Mzinyasha-na 1	South Africa	-28.314167	30.4722222	2930	20	Pta-6539	charcoal	Hunter-gatherer
Mzinyasha-na 1	South Africa	-28.314167	30.4722222	2840	60	Pta-6708	charcoal	Hunter-gatherer
Mzinyasha-na 1	South Africa	-28.314167	30.4722222	2630	60	Pta-6700	charcoal	Hunter-gatherer
Mzinyasha-na 1	South Africa	-28.314167	30.4722222	2260	50	Pta-6542	charcoal	Hunter-gatherer
Mzinyasha-na 1	South Africa	-28.314167	30.4722222	1520	20	Pta-6543	charcoal	Hunter-gatherer with possible farmer contact
Mzinyasha-na 1	South Africa	-28.314167	30.4722222	970	50	Pta-6538	charcoal	Hunter-gatherer and Farmer occupations
Mzinyasha-na 1	South Africa	-28.314167	30.4722222	790	50	Pta-6541	charcoal	Hunter-gatherer and Farmer occupations
Mzinyasha-na 1	South Africa	-28.314167	30.4722222	660	50	Pta-6715	charcoal	Hunter-gatherer and Farmer occupations
Mzonjani	South Africa	-29.733333	31.0541667	1670	40	Pta-1980	charcoal	Farming
Nanda	South Africa	-29.667778	30.8558333	1275	60	Wits-1917	-	Farming
Nauga 1	South Africa	-29.407189	31.42	1680	50	Pta-4506	charcoal	Pastoralists
Ndondond-wane	South Africa	-28.895	31.0311111	1220	50	Pta-2388	charcoal	Farming
Ndondond-wane	South Africa	-28.895	31.0311111	1190	50	Pta-2389	charcoal	Farming
Nelson Bay Cave	South Africa	-34.102778	23.375	2970	60	Pta-2913	charcoal	Hunter-gatherer
Nelson Bay Cave	South Africa	-34.102778	23.375	2085	35	Pta-1363	charcoal	Hunter-gatherer

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Nelson Bay Cave	South Africa	-34.102778	23.375	1930	60	GrN-5715	charcoal	Hunter-gatherer
Nelson Bay Cave	South Africa	-34.102778	23.375	**1100**	**80**	**OxA-873**	**sheep bone**	Hunter-gatherer
Nelson Bay Cave	South Africa	-34.102778	23.375	650	50	Pta-3362	charcoal	Herders
Nelson Bay Cave	South Africa	-34.102778	23.375	850	50	Pta-3361	charcoal	Herders
Nelson Bay Cave	South Africa	-34.102778	23.375	455	30	Pta-1361	charcoal	Herders
Niekerksfo-ntein 64 [NIE64]	South Africa	-31.569531	23.9646667	**350**	**50**	**Pta-5364**	**pottery (fibre)**	Hunter-gatherer-stock-keepers
Nkupe Shelter	South Africa	-28.146667	29.9366667	2480	60	Pta-3443	charcoal	Hunter-gatherer
Ntomdadlana	South Africa	-28.964444	29.9391667	630	50	Pta 8697	bone	Farming
Ntshekane	South Africa	-28.959722	30.4083333	1150	45	Pta-1058	-	Farming
Ntshekane	South Africa	-28.959722	30.4083333	1100	50	Pta-1057	-	Farming
Ntsitsana	South Africa	-31.066667	29.2	1290	50	Pta-4684	charcoal	Farming
Ntsitsana	South Africa	-31.066667	29.2	1180	50	Pta-4687	charcoal	Farming
Ntsitsana	South Africa	-31.066667	29.2	1180	50	Pta-4695	charcoal	Farming
Nuwekloof Shelter	South Africa	-33.516667	23.65	1140	50	Pta-4617	charcoal	unspecified LSA groups
Oakhurst Shelter	South Africa	-33.983333	22.5833333	2065	105	AA-2116	human bone	LSA
Oakleigh Farm [QOB]	South Africa	-31.802222	26.9005556	1040	50	Pta-935	charcoal	Pastoralist
Oakleigh Farm [QOB]	South Africa	-31.802222	26.9005556	360	50	Pta-801	charcoal	Pastoralist
Oliebooms-poort [OBP]	South Africa	-23.878333	27.6380556	2010	50	Pta-8410	charcoal	Hunter-gatherer with Bambata Ware
Oliebooms-poort [OBP]	South Africa	-23.878333	27.6380556	2000	25	Pta-8030	charcoal	Hunter-gatherer with Bambata Ware
Oliebooms-poort [OBP]	South Africa	-23.878333	27.6380556	1700	45	Pta-7798	charcoal	Hunter-gatherer with Bambata Ware

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Oliebooms-poort [OBP]	South Africa	-23.878333	27.6380556	1600	50	Pta-8032	charcoal	Hunter-gatherer contact with farmers and possibly pastoralists
Oliebooms-poort [OBP]	South Africa	-23.878333	27.6380556	1530	40	Pta-7799	charcoal	Hunter-gatherer contact with farmers and possibly pastoralists
Oliebooms-poort [OBP]	South Africa	-23.878333	27.6380556	1330	50	Pta-7418	charcoal	Hunter-gatherer contact with farmers and possibly pastoralists
Oliebooms-poort [OBP]	South Africa	-23.878333	27.6380556	1310	40	Pta-7780	charcoal	Hunter-gatherer contact with farmers and possibly pastoralists
Pancho's Kitchen Midden	South Africa	-32.339444	18.3333333	2640	60	Pta-5602	charcoal	LSA
Paternoster	South Africa	-32.8	17.8833333	870	50	Pta-1616	charcoal	unspecified LSA group
Pearly Beach Area	South Africa	-34.660194	19.4892306	1680	50	-	-	Pastoralist
Plaston	South Africa	-25.333333	31.0666667	1315	50	Pta-1635	charcoal	Farming
PN2009/001	South Africa	-29.246278	16.8743611	2670	30	UGAMS-6607	marine shell	LSA
Pont Drift	South Africa	-22.226483	29.2190111	1010	40	Pta-7240	-	Farming
Pont Drift	South Africa	-22.226483	29.2190111	1110	50	Pta-1961	-	Farming
Rautenbach's Cave	South Africa	-33.516667	23.7	1620	40	Pta-4611	charcoal	unspecified LSA groups
Reception Shelter (VR001)	South Africa	-31.526	18.6011111	2560	49	AA-89910	bone	Hunter-gather
Reception Shelter (VR001)	South Africa	-31.526	18.6011111	2578	25	OxA-22983	charcoal	Hunter-gather
Reception Shelter (VR001)	South Africa	-31.526	18.6011111	1840	26	OxA-25354	bone	Group 1 assemblage [hunter-gatherer]

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Reception Shelter (VR001)	South Africa	-31.526	18.6011111	1897	25	OxA-25353	bone	Group 1 assemblage [hunter-gatherer]
Reception Shelter (VR001)	South Africa	-31.526	18.6011111	828	44	AA-89909	bone	unspecified LSA group [Group 3]
Reception Shelter (VR001)	South Africa	-31.526	18.6011111	474	22	OxA-22982	sticks	unspecified LSA group [Group 3]
Renbaan Cave	South Africa	-32.233333	18.8666667	1910	60	Pta-3783	charcoal	Hunter-gatherer
Renbaan Cave	South Africa	-32.233333	18.8666667	1150	50	Pta-3768	charcoal	Hunter-gatherer
Riverside	South Africa	-25.436667	30.9688889	1540	40	Pta-7591	charcoal	Farming
Riverside	South Africa	-25.436667	30.9688889	1070	40	Pta-7670	charcoal	Farming
Riversmead Shelter	South Africa	-30.633333	25.5	2530	105	GX-0724	charcoal	Hunter-gatherer
Riversmead Shelter	South Africa	-30.633333	25.5	2285	115	GX-0723	charcoal	Hunter-gatherer [Developed LSA 4]
Rooikrans Rock Shelter	South Africa	-29.431392	27.3015861	415	65	OxA-3386	charcoal	Hunter-gatherer contact with pastoralists and farmers.
Rooiwal Hollow (LK2001/004)	South Africa	-30.451028	17.34875	2505	20	Pta-8915	marine shell	Hunter-gatherer groups
Roosfontein	South Africa	-28.816667	27.7333333	1290	50	Pta-5931	charcoal	Hunter-gatherers in contact with pastoralists
Rose Cottage Cave	South Africa	-29.216667	27.4666667	2240	60	Pta-7117	charcoal	Hunter-gatherer
Rose Cottage Cave	South Africa	-29.216667	27.4666667	680	50	Pta-5622	charcoal	Hunter-gatherer contact with pastoralists and farmers.
Rose Cottage Cave	South Africa	-29.216667	27.4666667	**610**	**50**	**Pta-350**	**grass-tempered sherd**	Hunter-gatherer contact with pastoralists and farmers.
Rose Cottage Cave	South Africa	-29.216667	27.4666667	**500**	**50**	**Pta-6788**	**organic material in potsherd**	Hunter-gatherer contact with

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								pastoralists and farmers.
SAM-AP 1449	South Africa	-32.178611	18.8908333	2330	100	OxA-453	human bone [direct]	Hunter-gatherer
SAM-AP 6031	South Africa	-33.177222	17.9655556	2560	50	Pta-4814	human bone	LSA
SAM-AP 6314	South Africa	-32.135833	18.3080556	2445	50	OxA-6219	human bone	LSA
Schroda	South Africa	-22.183333	29.4291667	1110	50	Pta-1819	charred post	Farming
Schroda	South Africa	-22.183333	29.4291667	1160	50	Pta-1967	charcoal	Farming
Schroda	South Africa	-22.183333	29.4291667	1140	45	Pta-7664	charcoal	Farming
Schroda	South Africa	-22.183333	29.4291667	1170	20	Pta-7666	charcoal	Farming
Schroda	South Africa	-22.183333	29.4291667	1060	20	Pta-7650	charcoal	Farming
Schroda	South Africa	-22.183333	29.4291667	1030	45	Pta-7659	charcoal	Farming
Scotts Cave	South Africa	-33.733333	25.7166667	1190	100	SR-82	charcoal	possible Herder stock post
Scotts Cave	South Africa	-33.733333	25.7166667	760	100	SR-82	charcoal	possible herder stock- post
Scotts Cave	South Africa	-33.733333	25.7166667	360	80	Y-1425	charcoal	possible herder stock- post
Seal Midden MB2005 - 005	South Africa	-30.468306	17.3600556	2620	70	GX-32525	marine shell	LSA
Seal Midden MB2005 - 005	South Africa	-30.468306	17.3600556	2560	60	GX-32524	marine shell	Hunter-gatherer
Sewula Gorge	South Africa	-29.0125	29.9519444	710	50	Pta 8370	charcoal	Farming
Sewula Gorge	South Africa	-29.0125	29.9519444	660	50	Pta 8372	charcoal	Farming
Shongweni South	South Africa	-29.862778	30.7208333	1170	50	Pta-1059	charcoal	Farming
Shongweni South	South Africa	-29.862778	30.7208333	**730**	**60**	**Pta-1060**	**Sorghum**	Farming
Shongweni South Cave	South Africa	-29.862778	30.7208333	1770	60	Pta-821	charcoal	Hunter-gatherer and Early farmer occupation.
Silver Leaves	South Africa	-23.922778	30.1433333	1760	50	Pta-2360	charcoal	Farming
Silver Leaves	South Africa	-23.922778	30.1433333	1700	40	Pta-2459	charcoal	Farming
Silver Leaves	South Africa	-23.922778	30.1433333	1680	60	Pta-901	charcoal	Farming

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Silver Leaves	South Africa	-23.922778	30.1433333	1620	50	Pta-914	charcoal	Farming
Simon se Klip [SSK]	South Africa	-32.161667	18.3333333	1440	60	GX-32343	marine shell	Pastoralist
Simon se Klip [SSK]	South Africa	-32.161667	18.3333333	1310	60	GX-32342	marine shell	Pastoralist
Simon se Klip [SSK]	South Africa	-32.161667	18.3333333	1210	60	GX-32241	marine shell	Pastoralist
SK17	South Africa	-25.069028	31.8572222	1210	50	Pta-3507	-	Farming
SK2001/039.	South Africa	-29.683278	17.0642222	609	25	OxA-24525	bone	unspecified LSA groups [Group 1 and 3]
SK2001/039.	South Africa	-29.683278	17.0642222	606	25	OxA-24524	bone	unspecified LSA groups [Group 1 and 3]
SK2005/057 A	South Africa	-29.688611	17.0635278	400	22	OxA-22981	charcoal	unspecified LSA groups [Group 2]
SK2005/074 A	South Africa	-29.688472	17.0636111	2132	27	OxA-24526	bone	LSA
SK2005/096.	South Africa	-29.688861	17.0642778	2740	25	UGAMS-8871	marine shell	LSA
SK2005/096.	South Africa	-29.688861	17.0642778	611	23	OxA-22974	bone	unspecified LSA groups [Group 1 and 3]
SK2005/096.	South Africa	-29.688861	17.0642778	654	23	OxA-22975	bone	unspecified LSA groups [Group 1 and 3]
Skeurkrans Shelter	South Africa	-23.440511	27.5392306	1850	50	Pta-5161	-	Hunter-gatherer
Smitswinkel-baai	South Africa	-34.266667	18.4666667	1420	35	Pta-2198	charcoal	unspecified LSA groups
Smitswinkel-baai	South Africa	-34.266667	18.4666667	1175	35	Pta-2200	charcoal	unspecified LSA groups
Spoegrivier	South Africa	-30.283333	17.2666667	2400	25	Pta-7200	charcoal	Hunter-gatherer
Spoegrivier	South Africa	-30.283333	17.2666667	**2105**	**65**	**OxA-3862**	**sheep bone**	Hunter-gatherers-with-livestock or pastoralist
Spoegrivier	South Africa	-30.283333	17.2666667	**1890**	**50**	**GrA-9029**	**sheep bone**	Hunter-gatherers-with-livestock or pastoralist
Spoegrivier	South Africa	-30.283333	17.2666667	**1900**	**50**	**GrA-9032**	**sheep bone**	Hunter-gatherers-

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								with-livestock or pastoralist
Spoegrivier	South Africa	-30.283333	17.2666667	1930	50	Pta-6749	charcoal	Hunter-gatherers-with-livestock or pastoralist
Spoegrivier	South Africa	-30.283333	17.2666667	1390	50	Pta-4753	charcoal	Hunter-gatherers-with-livestock or pastoralist
Spoegrivier	South Africa	-30.283333	17.2666667	**1490**	**50**	**GrA-9030**	**sheep bone**	Hunter-gatherers-with-livestock or pastoralist
Spoegrivier	South Africa	-30.283333	17.2666667	**1260**	**50**	**GrA-9027**	**sheep bone**	Hunter-gatherers-with-livestock or pastoralist
Springbok Midden SK400 or KN2001/026.	South Africa	-29.6825	17.0630278	420	45	Pta-9124	Springbok bone	LSA
Springbok Midden SK400 or KN2001/026.	South Africa	-29.6825	17.0630278	430	45	Pta-9099	Springbok bone	LSA
Springbok-oog [SBO]	South Africa	-30.227706	14.12	2710	50	Pta-4664	oes	LSA
Springbok-oog [SBO]	South Africa	-29.227706	14.13	2630	50	Pta-4205	oes	LSA
Springbok-oog [SBO]	South Africa	-28.227706	14.14	2520	60	Pta-4653	oes	LSA
St Francis Bay 1/A [SFB1/1]	South Africa	-34.160028	24.8302694	1770	50	Pta-9311	charcoal	Hunter-gatherer
St Francis Bay 2/1c [SFB2]	South Africa	-34.160028	24.8302694	1900	50	Pta-3910	charcoal	Hunter-gatherer
Steenberg's Cove	South Africa	-32.766667	18.0383333	1350	50	Pta-4010	charcoal	Pastoralist
Steenberg's Cove	South Africa	-32.766667	18.0383333	1280	50	Pta-4012	marine shell	Pastoralist
Steenbokfon-tein	South Africa	-32.161667	18.3333333	2690	60	Pta-6134	charcoal	LSA
Steenbokfon-tein	South Africa	-32.161667	18.3333333	2490	50	Pta-6505	twigs	LSA

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Steenbokfon-tein	South Africa	-32.161667	18.3333333	2360	45	Pta-6498	microfauna	LSA
Steenbokfon-tein	South Africa	-32.161667	18.3333333	2200	50	Pta-6424	charcoal	LSA
Steenbokfon-tein	South Africa	-32.161667	18.3333333	2200	60	Pta-6136	charcoal	LSA
Tandjiesberg Rock Shelter	South Africa	-28.45	27.1666667	860	60	Wits-2004	charcoal	Hunter-gatherer contact with pastoralists
Tortoise Cave	South Africa	-32.326944	18.3602778	1800	50	Pta-5616	charcoal	LSA
Tortoise Cave	South Africa	-32.326944	18.3602778	1780	50	Pta-5615	charcoal	LSA
Tortoise Cave	South Africa	-32.326944	18.3602778	1680	50	Pta-3312	charcoal	unspecified LSA group
Tortoise Cave	South Africa	-32.326944	18.3602778	1620	50	Pta-3310	charcoal	unspecified LSA group
Tortoise Cave	South Africa	-32.326944	18.3602778	1610	50	Pta-3311	charcoal	unspecified LSA group
Tortoise Cave	South Africa	-32.326944	18.3602778	1590	50	Pta-5817	charcoal	unspecified LSA group
Tortoise Cave	South Africa	-32.326944	18.3602778	1580	50	Pta-3309	charcoal	unspecified LSA group
Tortoise Cave	South Africa	-32.326944	18.3602778	1660	45	Pta-5855	charcoal	unspecified LSA group
Tortoise Cave	South Africa	-32.326944	18.3602778	760	50	Pta-3600	restoid seeds	unspecified LSA group
Tsh1	South Africa	-24.954556	31.7794444	1440	50	Pta-3825	-	Farming
Umbeli Belli Shelter	South Africa	-30.685833	30.2708333	1140	50	Pta-2825	charcoal	Hunter-gatherer
Umhlatuzana Rock Shelter	South Africa	-29.807778	30.7561111	2840	60	Pta-4215	charcoal	Hunter-gatherer
Uniondale Rock Shelter	South Africa	-33.260278	26.6661111	2130	60	Pta-1803	charcoal	unspecified LSA groups
Uniondale Rock Shelter	South Africa	-33.260278	26.6661111	2125	55	[Pta-1804]	charcoal	unspecified LSA groups
Vergelegen 179W [VLG179]	South Africa	-31.686197	24.1876972	**270**	**100**	**Pta-6031**	**pottery (fibre)**	Hunter-gatherer-stock-keepers
Vlermuisgat	South Africa	-30.910375	22.2367833	480	50	Pta-9510	charcoal	Hunter-gatherer
Voelvlei	South Africa	-33.4	19.0669444	420	40	Pta-5527	charcoal	-
Voelvlei	South Africa	-33.4	19.0669444	373	21	Pta-5547	charcoal	-
Volstruisfon-tein	South Africa	-31.483333	24.1166667	**1890**	**50**	**GrA-13560**	**fibre in pottery**	Hunter-gatherer with pottery

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Volstruisfon-tein	South Africa	-31.483333	24.1166667	**940**	**100**	**Pta-5941**	**fibre in pottery**	Hunter-gatherer-stock-keepers
Vonk se Stal	South Africa	-32.741667	17.96	1630	60	Pta-4243	charcoal	LSA
Welgeluk	South Africa	-32.912639	26.4244444	1360	50	Pta-3960	charcoal	Hunter-gatherer
Welgeluk	South Africa	-32.912639	26.4244444	510	50	Pta-3934	charcoal	Hunter-gatherer contact with farmers
White Elephant	South Africa	-29.262222	29.5344444	1930	65	OZD452	Crust covering paint	Fine-line painting
Wilton Large Rock Shelter	South Africa	-33.325	26.1416667	2270	100	GaK-1540	charcoal	Hunter-gatherer
Witklip [WK]	South Africa	-32.916944	17.9836111	1860	50	Pta-4609	charcoal	Hunter-gatherer [Smith et al. 1991]
Witklip [WK]	South Africa	-32.916944	17.9836111	1380	50	Pta-4608	charcoal	Hunter-gatherer
Witklip [WK]	South Africa	-32.916944	17.9836111	500	50	Pta-5469	charcoal	Hunter-gatherer
Wonderwerk	South Africa	-28.845833	23.5552778	1210	50	Pta-2779	charcoal	Pastoralist
Wosi	South Africa	-28.906944	31.0305556	1460	50	Pta-4100	charcoal	Farming
Wosi	South Africa	-28.906944	31.0305556	1430	60	Pta-4104	charcoal	Farming
Wosi	South Africa	-28.906944	31.0305556	1290	50	Pta-4094	charcoal	Farming
Wosi	South Africa	-28.906944	31.0305556	1270	60	Pta-4095	charcoal	Farming
Zaayfontein	South Africa	-30.633333	25.5	**1050**	**60**	**Pta-3393**	**Fibre from pottery**	Hunter-gatherer with pottery
Zoovoorbij	South Africa	-28.645	20.9783333	2800	60	Pta-2870	charcoal	Hunter-gatherer
Castle Cavern	Swaziland	-26.208333	31.0333333	1430	100	Y-1995	charcoal	Farming
2531DC19	Swaziland	-25.934167	31.6644444	**780AD**	**40**	**X-186**	**OSL pottery**	Farming
Chalaka	Zambia	-14.324444	28.6138889	1520	65	N-4995	charcoal	Farming
Chondwe	Zambia	-13.194444	28.7766667	1440	160	N-998	charcoal	Farming
Chondwe	Zambia	-13.194444	28.7766667	1150	145	N-997	charcoal	Farming
Chondwe	Zambia	-13.194444	28.7766667	1135	130	GX-1009	charcoal	Farming
Chondwe	Zambia	-13.194444	28.7766667	1060	95	GX-1010	charcoal	Farming
Chowo River	Zambia	-14.2065	31.2031944	1670	40	Beta-182951	-	Farming

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Chowo River	Zambia	-14.2065	31.2031944	1600	40	Beta-182956	-	Farming
Chowo River	Zambia	-14.2065	31.2031944	1480	40	Beta-182957	-	Farming
Chowo River	Zambia	-14.2065	31.2031944	1410	40	Beta-182953	-	Farming
Chowo River	Zambia	-14.2065	31.2031944	1370	90	Beta-182954	-	Farming
Chowo River	Zambia	-14.2065	31.2031944	1340	40	Beta-182952	-	Farming
Chowo River	Zambia	-14.2065	31.2031944	1010	130	Beta-182955	-	Farming
Chundu	Zambia	-17.583333	25.6833333	1290	100	N-1138	charcoal	Farming
Chundu	Zambia	-17.583333	25.6833333	1190	100	N-1137	charcoal	Farming
Chundu	Zambia	-17.583333	25.6833333	1160	160	N-1139	charcoal	Farming
Dambwa	Zambia	-17.755556	25.8486111	1330	110	SR-62	charcoal	Farming
Dambwa	Zambia	-17.755556	25.8486111	1200	95	SR-97	charcoal	Farming
Dambwa	Zambia	-17.755556	25.8486111	1170	90	SR-98	charcoal	Farming
Dambwa	Zambia	-17.755556	25.8486111	1350	100	SR-106	wood	Farming
Dambwa	Zambia	-17.755556	25.8486111	1290	120	SR-119	charcoal	Farming
Fibobe 2	Zambia	-14.275	28.6325	1450	110	NZ-4999	charcoal	Farming
Fibobe 2	Zambia	-14.275	28.6325	1200	65	NZ-5000	charcoal	Farming
Fibobe 2	Zambia	-14.275	28.6325	1175	85	NZ-5004	charcoal	Farming
Gundu	Zambia	-16.75	27.2833333	1510	85	GX-1114	charcoal	Farming
Gundu	Zambia	-16.75	27.2833333	965	100	N-428	charcoal	Farming
Ingombe Ilede	Zambia	-16.2	28.8	1120	200	SR-22	-	Farming
Ingombe Ilede	Zambia	-16.2	28.8	1150	100	SR-23	-	Farming
Isamu Pati	Zambia	-17.066667	26.3333333	910	90	SR-31	charcoal	Farming
Isamu Pati	Zambia	-17.066667	26.3333333	890	50	UCLA-176	charcoal	Farming
Isamu Pati	Zambia	-17.066667	26.3333333	910	90	SR-80	charcoal	Farming
Isamu Pati	Zambia	-17.066667	26.3333333	960	70	UCLA-177	charcoal	Farming
Isamu Pati	Zambia	-17.066667	26.3333333	995	61	R 874	charcoal	Farming
Kabondo Kumbo	Zambia	-17.233333	25.8666667	1430	80	N-1918	-	Farming
Kabondo Kumbo	Zambia	-17.233333	25.8666667	1240	65	N-1922	-	Farming
Kabondo Kumbo	Zambia	-17.233333	25.8666667	1160	85	N-1920	-	Farming
Kabondo Kumbo	Zambia	-17.233333	25.8666667	1150	85	N-1919	-	Farming
Kabondo Kumbo	Zambia	-17.233333	25.8666667	1090	130	N-1921	-	Farming
Kabondo Kumbo	Zambia	-17.233333	25.8666667	1020	95	N-1917	-	Farming
Kalambo Falls (Site A)	Zambia	28.41	30.1522833	1080	180	L-395B	-	Farming

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Kalambo Falls (Site C)	Zambia	28.41	30.1522833	1605	40	GrN-4646	-	Farming
Kalambo Falls (Site C)	Zambia	28.41	30.1522833	1520	40	GrN-4647	-	Farming
Kalundo Mound	Zambia	-17.05	26.5	1650	90	SR-65	charcoal	Farming
Kalundo Mound	Zambia	-17.05	26.5	1495	95	SR-123	charcoal	Farming
Kalundo Mound	Zambia	-17.05	26.5	1160	90	SR-41	charcoal	Farming
Kalundo Mound	Zambia	-17.05	26.5	1050	100	SR-66	charcoal	Farming
Kamangoza	Zambia	-17.616667	25.5333333	1015	105	N-419	charcoal	Farming
Kamangoza	Zambia	-17.616667	25.5333333	1040	105	N-421	charcoal	Farming
Kamangoza	Zambia	-17.616667	25.5333333	975	105	N-457	charcoal	Farming
Kamangoza	Zambia	-17.616667	25.5333333	940	105	N-423	charcoal	Farming
Kamangoza	Zambia	-17.616667	25.5333333	900	105	N-426	charcoal	Farming
Kamangoza	Zambia	-17.616667	25.5333333	900	105	N-424	charcoal	Farming
Kamangoza	Zambia	-17.616667	25.5333333	870	105	N-425	charcoal	Farming
Kamnama	Zambia	-13.516667	32.8333333	1600	110	N-908	charcoal	Farming
Kangonga	Zambia	-13.066667	28.6666667	1185	85	GX-1327	-	Farming
Kapwirimb-we	Zambia	-15.383333	28.3666667	1540	85	GX1013b	charcoal	Farming
Kapwirimb-we	Zambia	-15.383333	28.3666667	1445	95	GX-1912	charcoal	Farming
Kapwirimb-we	Zambia	-15.383333	28.3666667	1525	110	GX1013a	charcoal	Farming
Kazindu	Zambia	-16.766667	25.0166667	1150	75	N-2315	charcoal	Farming
Kazindu	Zambia	-16.766667	25.0166667	1130	75	N-2316	charcoal	Farming
Kumadzulo	Zambia	-17.616667	25.5333333	1529	110	N-409	charcoal	Farming
Kumadzulo	Zambia	-17.616667	25.5333333	1400	110	N-411	charcoal	Farming
Kumadzulo	Zambia	-17.616667	25.5333333	1390	110	N-410	charcoal	Farming
Kumadzulo	Zambia	-17.616667	25.5333333	1330	110	N-412	charcoal	Farming
Kumadzulo	Zambia	-17.616667	25.5333333	1320	110	N-413	charcoal	Farming
Kumadzulo	Zambia	-17.616667	25.5333333	1260	110	N-414	charcoal	Farming
Leopards Hill Cave	Zambia	-15.416667	28.7166667	1415	125	SR-126	-	Farming
Lonze Forest	Zambia	-16.85	25.1166667	1481	82	C-660	charcoal	Farming
Lubusi	Zambia	-14.366667	24.0833333	1070	60	SR-216	-	Farming
Lusu	Zambia	-17.233333	24.0833333	2025	230	C-830	charcoal	Farming
Makwe	Zambia	-14.413333	31.9333333	1730	110	PGX-1551	charcoal	Farming
Mondake	Zambia	-14.338889	28.6166667	1510	105	NZ-4997	charcoal	Farming
Mondake	Zambia	-14.338889	28.6166667	1355	60	NZ-4998	charcoal	Farming
M'teteshi	Zambia	-14.279167	28.5958333	1810	80	-	charcoal	Farming
M'teteshi	Zambia	-14.279167	28.5958333	2030	90	-	charcoal	Farming

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Nakapapula Rockshelter	Zambia	-12.816667	30.6166667	910	85	GX-767	charcoal	Farming
Namakala	Zambia	-16.7	24.9666667	1360	80	N-2317	charcoal	Farming
Nanga	Zambia	-16.65	25	1240	100	Birm-836	charcoal	Farming
Nanga	Zambia	-16.65	25	1190	100	Birm-835	charcoal	Farming
Ndonde	Zambia	-16.733333	27.4	870	105	N-433	charcoal	Farming
Samfya Forest	Zambia	12.86	8.22	1520	80	N-1934	-	Farming
Samfya Forest	Zambia	12.86	8.22	1600	80	N-1935	-	Farming
Sioma Mission	Zambia	-16.633333	23.5333333	1498	75	N-1498	charcoal	Farming
Situmpa	Zambia	-16.85	25.1166667	1845	212	C-829	charcoal	Farming
Situmpa	Zambia	-16.85	25.1166667	1930	100	-	charcoal	Farming
Situmpa	Zambia	-16.85	25.1166667	2110	50	Pta-2486	charcoal	Farming
Situmpa	Zambia	-16.85	25.1166667	1710	100	SR-40	charcoal	Farming
Thandwe	Zambia	-13.816667	32.6333333	890	110	N-905	charcoal	Farming
Thandwe	Zambia	-13.816667	32.6333333	1060	110	N-906	charcoal	Farming
Twickenham Road	Zambia	-15.4	28.3	895	110	GX-662	-	Farming
Zambezi Farm	Zambia	-17.816667	25.6166667	1410	130	N-1140	-	Farming
Zambezi Farm	Zambia	-17.816667	25.6166667	910	160	N-1143	-	Farming
Bambata Cave	Zimbabwe	-20.502778	28.4069444	2140	60	Pta-3072	charcoal	Hunter-gatherer with pottery
Cigwa Hill	Zimbabwe	-20.35	30.8833333	1540	95	SR-119	-	Farming
Gokomere	Zimbabwe	-19.957844	30.7766417	1420	120	SR-26	-	Farming
Great Zimbabwe	Zimbabwe	-20.25	30.9333333	1630	75	M913	charcoal	Farming
Gwenzi II Hill	Zimbabwe	-19.213153	32.3456722	930	30	GrA-26882	charcoal	LSA with farmer pottery
Gwenzi II Hill	Zimbabwe	-19.213153	32.3456722	685	30	GrA-26883	charcoal	LSA with farmer pottery
Gwenzi II Hill	Zimbabwe	-19.213153	32.3456722	320	70	[Pta-9309]	charcoal	LSA with farmer pottery
Impala Rockshelter	Zimbabwe	-18.738519	26.5207111	2310	40	Beta-23182	charred wood	LSA
Kadzi	Zimbabwe	-16.577386	30.7610972	1475	70	Ua-4106	charcoal	Farming
Kadzi	Zimbabwe	-16.577386	30.7610972	1445	80	Ua-4105	charcoal	Farming
Kadzi	Zimbabwe	-16.577386	30.7610972	1410	80	Ua-4104	charcoal	Farming
Kadzi	Zimbabwe	-16.577386	30.7610972	1290	50	Ua-3195	charcoal	Farming
Kamukom-be	Zimbabwe	-16.395306	31.0133333	1370	210	Pta-9643	-	Farming
Kamukom-be	Zimbabwe	-16.395306	31.0133333	1520	60	Pta-9638	-	Farming

Appendix 1:

A list of site names, radiocarbon dates and geographic locations captured in the three southern African archaeological databases.

Site Name	*Country*	*Latitude*	*Longitude*	*uncal. Radiocarbon determination or AMS date*	*SD*	*Lab Code*	*Type of material Dated*	*Broad subsistence category*
Kamukom-be	Zimbabwe	-16.395306	31.0133333	1480	150	Pta-9641	-	Farming
Kamukom-be	Zimbabwe	-16.395306	31.0133333	1785	15	Pta-9642	-	Farming
Kwali Camp	Zimbabwe	-21.033333	31.8666667	1490	60	Beta-200558	charcoal	Farming
Kwali Camp	Zimbabwe	-21.033333	31.8666667	1320	40	Beta-200557	charcoal	Farming
Kwali Camp	Zimbabwe	-21.033333	31.8666667	1240	70	Beta-200556	charcoal	Farming
Lanlory	Zimbabwe	-16.760278	29.4708333	1130	50	Pta-606	charcoal	Farming
Leopard's Kopje	Zimbabwe	-20.116667	28.4333333	1250	110	SR-55	charcoal	Farming
Leopard's Kopje	Zimbabwe	-20.116667	28.4333333	1280	90	SR-225	charcoal	Farming
Leopard's Kopje	Zimbabwe	-20.116667	28.4333333	1130	95	I-4862	charcoal	Farming
Mabveni	Zimbabwe	-20.366667	30.4666667	1380	110	SR-79	-	Farming
Mabveni	Zimbabwe	-20.366667	30.4666667	1365	30	Pta-2105	-	Farming
Mabveni	Zimbabwe	-20.366667	30.4666667	1770	120	SR-43	-	Farming
Manjowe Main	Zimbabwe	-19.466667	32.6333333	900	50	Pta-9311	charcoal	LSA with farmer pottery
Manjowe Main	Zimbabwe	-19.466667	32.6333333	375	30	GrA-26832	charcoal	LSA with farmer pottery
Mwenezi	Zimbabwe	-21.818228	31.0421444	1250	75	Ua-11802	charcoal	Farming
Samakande	Zimbabwe	-17.464722	32.7897222	1580	35	Ua-37563	charcoal	Farming
Tafuna Hill	Zimbabwe	-17.384722	31.5361111	1070	105	N-1148	charcoal	Farming
Tshangula Cave	Zimbabwe	-21.272792	28.8374028	2150	100	SR-75	charcoal	LSA

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Appendix 2

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2.1. Appendix 2: The lactase persistence genetic dataset (Dataset 1): Methods and materials.

Materials

The southern African Lactase Persistence (LP) dataset was reproduced from data provided by Breton *et al*. (2014) and Macholdt *et al*. (2014) for LP populations occupying Namibia and the Northern Cape of South Africa with Ranciaro *et al.* (2014); Coelho *et al.* (2009) and Pinto *et al*. (2016) for Angolan and Mozambican LP populations. The East African Lacatase Persistence dataset is replicated from data reported by Tishkoff *et al*. (2007) and Ranciaro *et al*. (2014) with Ingrim *et al.* (2009) and Jones *et al*. (2015) used as additional sources.

Geographic information

The geographic co-ordinates provided in this dataset were obtained through the relevant publication maps and related geographic information provided. The co-ordinates are therefore approximations of where the various genetic samples have been obtained. For the East African component of the dataset, latitudes and longitudes were provided by Ranciaro *et al.* (2014).

Type of information captured

The frequencies and findings of the lactase persistent genes for various population groups captured in the dataset is directly reproduced from the corresponding publications including a population's linguistic affiliation and subsistence type if provided.

The genetic database contains the following information:

1. Map Code.
2. Ethnic group or population.
3. Population language.
4. Ethnic group subsistence type.
5. Number of people or number of chromosomes that were analysed in the study.
6. Region where genetic tests were obtained/or approximate region where the relevant ethnic group is located.
7. Estimated geographic co-ordinates according to genetic publications.

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8. Genetic frequency results [provided as percentages where possible].
9. The overall genetic signature or result based on the findings from publication.
10. Source/References.

Map codes related with the visual interpretation of the genetic data

The map codes labelled 1-144 on the maps [Figs 3.2, 3.3 and 3.4 of Chapter 3, Part Two] correspond to the codes provided in the database and can be used to identify the population and their relevant genetic results. Different codes are used for each input of an ethnic group. Where the same results are obtained for the same ethnic population but who occupy different regions, then one code was used.

Appendix 2:

2.1.1. Dataset 1 The Lactase Persistence Dataset.

Map Code	*Ethnic group*	*Language*	*Subsistence*	*Number of people or chromosomes tested*	*Region where genetic studies were carried out*	*Decimal Latitude*	*Decimal Longitude*	*-14010*C*	*Frequency Results*	*Source[s]*
SOUTHERN AFRICAN LACTASE PERSISTENCE DATASET.										
1	**Nama**	Khoe	Pastoralists	22	Windhoek, Namibia	-22.5624	17.06599	0.357	High frequency LP SNP [14010G>C][35.7% for East African gene]	Breton et al. 2014 [see also Macholdt et al. 2014]
2	**Askham Coloured**	Khoe - Nama-Damara	-	20	Askham, Northern Cape, South Africa	-26.9834	20.78333	0.225	Relative high frequency LP SNP [14010G>C] [22,5% East African gene]	Breton et al. 2014
3	**Wellington Coloured**	Afrikaans	-	20	Wellington, Western Cape, South Africa	-33.6818	19.01023	0.1	Relative high frequency LP [14010G>C] [10% East African gene] [17.5% European LP 13910T gene]	Breton et al. 2014
4	**Colesberg Coloured**	Afrikaans	-	20	Colesberg, Northern Cape, South Africa	-30.8388	25.07629	0.025	Low frequency LP [1410G>C][2.5% East African gene] [5% European LP 13910T gene]	Breton et al. 2014
5	**|Gwi and ||Gana**	Khoe	Hunter-gatherers (recently transitioned to goat-owners).	20	Kutse Game Reserve, Kalahari, Botswana	-23.4223	24.04879	0.071	Relative frequency LP [1410G>C][7.1% East African gene][0% European gene]	Breton et al. 2014

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5	**‖Gana**	Khoe	Hunter-gatherers (recently transitioned to goat-owners).	10	Kutse Game Reserve, Kalahari, Botswana	-23.4223	24.04879	0.2	20% LP -14010*C [East African]	Macholdt et al. 2014
5	**|Gwi**	Khoe	Hunter-gatherers (recently transitioned to goat-owners).	17	Kutse Game Reserve, Kalahari, Botswana	-23.4223	24.04879	0.088	8.8% LP -14010*C [East African]	Macholdt et al. 2014
6	**Khwe**	Khoe	Hunter-gatherers	19	Schmidtsdrif, Northern Cape, South Africa	-28.8134	24.10132	0.029	Low frequency LP [1410G>C][2.9% East African gene][0% European gene]	Breton et al. 2014
6	**Khwe**	Khoe	Hunter-gatherers		Grootfontein, Namibia	-19.6113	18.10939	0.029	Low frequency LP [1410G>C][2.9% East African gene][0% European gene]	Breton et al. 2014
7	**Ju/'hoansi**	Ju - Northeast - Ju/'hoan	Hunter-gatherers	20	Tsumkwe, Namibia	-19.6009	20.50384	0.029	Low frequency LP [1410G>C][2.9% East African gene] [0% European LP 13910T gene/2.9%13913C European gene]	Breton et al. 2014
8	**Ju|hoan_ North**	Kx'a	Hunter-gatherers	21	North West, Botswana	-20.5814	21.67013	0.024	2.4% LP -14010*C [East African]	Macholdt et al. 2014
9	**Ju|hoan_ South**	Kx'a	Hunter-gatherers	26	Ghanzi, Botswana border with Namibia	-21.1943	21.06119	0.058	5.8% LP -14010*C [East African]	Macholdt et al. 2014

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10	**!Xun**	Ju - Northwest - /Xũu	Hunter-gatherers	20	Schmidtsdrif, Northern Cape, South Africa	-28.8134	24.10119	0.038	Low frequency LP [1410G>C][3.8% East African gene] [7.7% 13913C European gene]	Breton et al. 2014
10	**!Xun**	Ju - Northwest - /Xũu	Hunter-gatherers		Grootfontein, Namibia	-19.6113	18.10939	0.038	Low frequency LP [1410G>C][3.8% East African gene] [7.7% 13913C European gene]	Breton et al. 2014
20	**!Xuun**	Kx'a	Hunter-gatherers	19	Nyae Nyae, Namibia	-19.7057	20.49703	0.053	5.3% LP -14010*C [East African]	Macholdt et al. 2014
47	**!Xuun**	Kx'a	Hunter-gatherers	72 [chromosomes]	Mupa, Angola	-16.1831	15.76708	0.014	1.4% LP -14010*C East African	Pinto et al. 2016
11	**Karretjie People**	/Xam descendants	Nomadic sheep shearers	20	Colesberg, Northern Cape, South Africa	-30.8388	25.07629	0.083	Relative frequency LP [1410G>C][8.3% East African gene][4.2% European gene]	Breton et al. 2014
12	**Khomani**	non-Khoe	-	20	Askham, Northern Cape, South Africa	-26.9834	20.78333	0.11	Relative frequency LP [1410G>C][11% East African gene][0% European gene]	Breton et al. 2014
13	**Herero**	western Bantu	Pastoralists	14	Windhoek, Namibia	-17.0624	17.06599	0	No lactase persistence gene	Breton et al. 2014
14	**Herero**	western Bantu	Pastoralists	21	Windhoek, Namibia	-22.5624	17.06599	0.071	7.1% LP -14010*C [East African]	Macholdt et al. 2014 [see also Torniainen et al. 2009 and Breton et al. 2014]

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2.1.1. Dataset 1 The Lactase Persistence Dataset.

38	**Kuvale/Herero**	Herero, west Savanna Bantu	Pastoralists	54	Namibe, Angola	-16.0277	12.43632	0.06	High frequencies of Y-chromosome [12%] and MtDNA [22%] with Khoe-San lineages. Relative frequency of LP [1410C][6%]	Coelho et al. 2009 [see also Alves et al. 2011]
42	**Kuvale**	west Savanna Bantu	Pastoralists	162 [chromosomes]	Namibe, Angola [1 sample location]	-14.5436	13.10684	0.037	3.7% LP -14010*C East African	Pinto et al. 2016 [see also Coelho et al. 2009]
42	**Kuvale**	west Savanna Bantu	Pastoralists		Namibe, Angola [2 sample location]	-15.3969	12.83899	0.037	3.7% LP -14010*C East African	Pinto et al. 2016 [see also Coelho et al. 2009]
42	**Kuvale**	west Savanna Bantu	Pastoralists		Namibe, Angola [3 sample location]	-15.5753	12.76128	0.037	3.7% LP -14010*C East African	Pinto et al. 2016 [see also Coelho et al. 2009]
15	**Sotho-Tswana and Zulu**	eastern Bantu	Agropastoralist	16 [Sotho-Tswana] 25 [Zulu]	various regions, South Africa	-27.9865	29.86269	0.1	Relative frequency LP [1410G>C][10% East African gene]	Breton et al. 2014
16	**Taa-East**	Tuu	Hunter-gatherers	11	Kgalagadi, Botswana	-24.3548	22.81767	0.045	4.5% LP -14010*C [East African]	Macholdt et al. 2014
17	**Taa-North**	Tuu	Hunter-gatherers	11	Kgalagadi, Botswana	-23.59	21.61049	0	0% LP -14010*C/4.5% LP -13913*C [European]	Macholdt et al. 2014
18	**Taa-West**	Tuu	Hunter-gatherers	20	Kgalagadi, Botswana	-24.7803	20.10442	0.025	2.5% LP -14010*C [East African]	Macholdt et al. 2014

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19	**ǂHoan**	Kx'a	Hunter-gatherers	7	Kgalagadi, Botswana	-24.3368	22.34	0	0% LP -14010*C	Macholdt et al. 2014
21	**‖Ani**	Khoe	Hunter-gatherers	11	North West, Botswana	-18.5167	21.94934	0.091	9.1% LP -14010*C [East African]	Macholdt et al. 2014
22	**Buga**	Khoe	Hunter-gatherers	9	North West, Botswana	-18.3716	21.85806	0	0% LP -14010*C [East African]	Macholdt et al. 2014
23	**‖Xo**	Khoe	Hunter-gatherers	19	Caprivi Strip	-17.9231	22.72381	0.079	7.9 % LP -14010*C [East African]	Macholdt et al. 2014
24	**Damara**	Khoe	Hunter-gatherers and pastoralists	34	Kunene Region, Namibia	-20.4608	14.01402	0.044	4.4% LP -14010*C [East African]	Macholdt et al. 2014
25	**Haiǁom**	Khoe	Hunter-gatherers	40	Kunene Region, Namibia	-19.6687	14.70835	0.088	8.8% LP -14010*C [East African]	Macholdt et al. 2014
26	**Naro**	Khoe	Hunter-gatherers (recently transitioned to livestock-keepers).	19	Ghanzi, Botswana	-22.01	21.23226	0.053	5.3% LP -14010*C [East African]	Macholdt et al. 2014
27	**Shua**	Khoe	Hunter-gatherers	27	Makgadikgadi, Botswana	-20.5509	25.81031	0.074	7.4% LP -14010*C [East African]	Macholdt et al. 2014

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2.1.1. Dataset 1 The Lactase Persistence Dataset.

28	**Tshwa**	Khoe	Hunter-gatherers	15	Makgadikgadi, Botswana	-21.3433	26.04308	0.167	16.7% LP -14010*C [East African]	Macholdt et al. 2015
29	**Himba**	western Bantu	Pastoralists	16	Skeleton Coast, Namibia	-19.5689	13.67961	0.125	12.5% LP -14010*C [East African]	Macholdt et al. 2014
41	**Himba**	west Savanna Bantu	Pastoralists	138 chromosomes	Namibe, Angola [1 sample location]	-17.0017	12.43598	0.087	8.7% LP -14010*C East African	Pinto et al. 2016 [see also Macholdt et al. 2014]
41	**Himba**	west Savanna Bantu	Pastoralists		Namibe, Angola [2 sample location]	-16.8911	12.43598	0.087	8.7% LP -14010*C East African	Pinto et al. 2016 [see also Macholdt et al. 2014]
30	**Kgalagadi**		Agropastoralist	20	Kgalagadi, Botswana	-24.7289	22.70295	0	0% LP -14010*C [East African]	Macholdt et al. 2014
31	**Tonga**	eastern Bantu	Agriculturist	17	southern Zambia	-17.7183	26.82519	0	0% LP -14010*C [East African]	Macholdt et al. 2014
32	**Tswana**	eastern Bantu	Agropastoralist	18	Kweneng, southern Botswana	-24.3324	25.6049	0.028	2.8% LP -14010*C [East African]	Macholdt et al. 2014 [see also Breton et al. 2014]
33	**Nkoya**	eastern Bantu	Agropastoralist	16	Zambia	-14.6633	25.50005	0.031	3.1% LP -14010*C [East African]	Macholdt et al. 2014

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34	**Wambo**		Agriculturist	8	northern Nambia	-17.7569	16.63925	0	0% LP -14010*C [East African]	Macholdt et al. 2014
35	**!Xhosa**	eastern Bantu	Agropastoralist	109	Eastern Cape and Western Cape, South Africa	-33.1477	26.54454	0.128	[1410G>C][East African gene of 12.8% of the total population tested][0% of the 13910C/T European LP variant]	Torniainen et al. 2009
35	**!Xhosa**	eastern Bantu	Agropastoralist	-	Western Cape, South Africa	-34.079	19.10157	0.1429	14.29% LP -14010*C East African	Ranciaro et al. 2014
36	**Venda**	eastern Bantu	Agropastoralist	-	Thohoyandou, South Africa	-23.1016	30.59716	0	0.0% LP -14010*C East African	Ranciaro et al. 2014
37	**Ovimbun-du**	west Savanna Bantu	mostly agriculturist [cattle raising not crucial for subsistence]	96	Namibe, Angola	-14.733	13.24521	0.01	96% MtDNA matches with West-Central Africa. MtDNA also shows a Khoe-San admixture.Y-chromosome data shows similar trend. Low frequency of 1% LP [14010C]	Coelho et al. 2009

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39	**Nyaneka-Nkhumbi**	west Savanna Bantu	Agropastoralist [cattle raisers]	153	Namibe, Angola	-15.1194	12.71634	0.03	96% MtDNA matches with West-Central Africa. MtDNA also shows a Khoe-San admixture. Y-chromosome data shows similar trend. Relatively low frequency of 3% LP [14010C]	Coelho et al. 2009
40	**Guanguela**	west Savanna Bantu	Mixed farmers	96	Namibe, Angola	-15.44	12.92882	0	96% MtDNA matches with West-Central Africa. MtDNA also shows a Khoe-San admixture. Y-chromosome data shows similar trend. No LP frequency observed.	Coelho et al. 2009
43	**Kwepe**	Khoe-Kwadi [recently replaced by Kuvale]	Shepards/livestock keepers		Namibe, Angola [1 sample location]	-15.8062	12.1081	0.044	4.4% LP -14010*C East African	Pinto et al. 2016
43	**Kwepe**	Khoe-Kwadi [recently replaced by Kuvale]	Shepards/livestock keepers		Namibe, Angola [2 sample location]	-15.8274	12.45268	0.044	4.4% LP -14010*C East African	Pinto et al. 2016

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44	**Kwisi**	Kuvale-west Savanna Bantu	Hunter-gatherers [recently cattle keepers]	40 chromosomes	Namibe, Angola [1 sample location]	-15.7196	12.45046	0.175	17.5% LP -14010*C East African	Pinto et al. 2016
44	**Kwisi**	Kuvale-west Savanna Bantu	Hunter-gatherers [recently cattle keepers]		Namibe, Angola [2 sample location]	-15.5978	12.73733	0.175	17.5% LP -14010*C East African	Pinto et al. 2016
45	**Twa**	Kuvale-west Savanna Bantu	Hunter-gatherers [recently cattle keepers]	36 chromosomes	Namibe, Angola [1 sample location]	-15.8536	12.12054	0.194	19.4% LP -14010*C East African	Pinto et al. 2016
45	**Twa**	Kuvale-west Savanna Bantu	Hunter-gatherers [recently cattle keepers]		Namibe, Angola [2 sample location]	-16.8092	12.50899	0.194	19.4% LP -14010*C East African	Pinto et al. 2016
46	**Tjimba**	Himba-west Savanna Bantu	Cattle-less pastoralists [hunter-gatherers]	30 chromosomes	Namibe, Angola	-17.1096	12.69041	0.233	23.3% LP -14010*C East African	Pinto et al. 2016
48	**Yao**	Kaskazi–speaking	agriculturist	30 chromosomes	northern Mozambique	-12.9998	35.30324	0	0.0% LP -14010*C East African	Pinto et al. 2016; Alves et al. 2011

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49	**Nyanja**	Kusi-speaking, southeast Bantu	agriculturist	22 chromosomes	Mozambique	-14.9577	34.16792	0	0.0% LP -14010*C East African	Pinto et al. 2016; Alves et al. 2011
50	**Makua**	Kusi-speaking, southeast Bantu	agriculturist	28 chromosomes	Mozambique	-15.2267	39.23246	0	0.0% LP -14010*C East African	Pinto et al. 2016; Alves et al. 2011
51	**Tswa**	Kusi-speaking, southeast Bantu	agriculturist	36 chromosomes	Mozambique	-21.4492	35.00139	0	0.0% LP -14010*C East African	Pinto et al. 2016; Alves et al. 2011
52	**Shangaan**	Kusi-speaking, southeast Bantu	Agriculturist	46 chromosomes	Mozambique	-24.8958	32.98332	0.022	2.2% LP -14010*C East African	Pinto et al. 2016; Alves et al. 2011
53	**Chopi**	southeast Bantu	Agriculturist	-	Mozambique	-24.792	34.37146	0	0%LP -14010*C East African	Ranciaro et al. 2014
54	**Ronga**	southeast Bantu	Agriculturist	-	southern Mozambique	-26.345	32.50994	0	0%LP -14010*C East African	Ranciaro et al. 2014
55	**Sena**	southeast Bantu	Agriculturist	-	Mozambique	-17.7261	34.95491	0	0%LP -14010*C East African	Ranciaro et al. 2014
56	**Ndau**	southeast Bantu	Agriculturist	-	Mozambique	-19.3029	34.55766	0	0%LP -14010*C East African	Ranciaro et al. 2014

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57	**Chwabo**	southeast Bantu	Agriculturist		Mozambique	-17.1928	36.45974	0	0%LP -14010*C East African		Ranciaro et al. 2014
58	**Shona**	southeast Bantu	Agriculturist/ Agropastoralist		Harare, Zimbabwe	-17.9233	30.95064	0	0%LP -14010*C East African		Coelho et al. 2009
59	**Swazi**	southeast Bantu	Agropastoralist	12	Mbabane, Swaziland	-26.3323	31.15249	0	low LP [78% lactase deficiency]		Segal et al. 1987 [see also Holden & Mace 2009].
EAST AFRICAN LACTASE PERSISTENCE DATASET.											
Map Code	***Ethnic group***	***Language***	***Subsistence***	***Number of people or chromosomes***	***Region where genetic studies were carried out***	***Decimal Latitude***	***Decimal Longitudee***	***Frequency Results [%]***			***Source[s]***
								-14010*C	***-13907*G***	***-13915*G***	
60	**Beja Banuamir**	Afro-Asiatic	Pastoralist	6	Sudan	15.457	36.4001	0	0.25	0.167	Tishkoff et al. 2006
61	**Beja Hadanda-wa**	Afro-Asiatic	Pastoralist	11	Sudan	15.457	36.4001	0	0.182	0.091	Tishkoff et al. 2006
62	**Dinka**	Nilo-Saharan	Pastoralist	9	Sudan	8.5	28.5	0	0	0	Tishkoff et al. 2006 [see Holden & Mace 2002; Ranciaro et al. 2014]

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2.1.1. Dataset 1 The Lactase Persistence Dataset.

63	**Nuer**	Nilo-Saharan	Pastoralist	5	Sudan	8	32	0	0	0	Tishkoff et al. 2006 [see Holden & Mace 2002; Ranciaro et al. 2014]
64	**Shilook**	Nilo-Saharan	Pastoralist	8	Sudan	9.536944	31.656111	0	0	0	Tishkoff et al. 2006.
65	**Ama**	Nilo-Saharan	Agropastoralist	2	Sudan	4.903839	31.56288056	0	0	0	Tishkoff et al. 2006. [see also Ranciaro et al. 2014]
66	**Masalit**	Nilo-Saharan	Agropastoralist	1	Sudan	4.903839	31.56288056	0	0	0	Tishkoff et al. 2006.
67	**Liguri/ Logorik**	Nilo-Saharan	Agropastoralist	1	Sudan	4.903839	31.56288056	0	0	0	Tishkoff et al. 2006.
68	**Koalib**	Nilo-Saharan	Agropastoralist	1	Sudan	4.903839	31.56288056	0	0	0	Tishkoff et al. 2006.
69	**Jaali**	Afro-Asiatic - Semitic	Pastoralist	128 chromosomes	Sudan	16.69	33.43	0.000	0	0.423	Jones et al. 2015
70	**Nyimang**	Nilo-Saharan	Pastoralists	4	Sudan			0	0	0	Ranciaro et al. 2014

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71	**Boni**	Afro-Asiatic	Hunter-gatherer	24	Kenya	-2.21445	40.48838	0.208	0	0	Ranciaro et al. 2014
72	**Borana**	Afro-Asiatic	Pastoralist	8	Kenya	2.333056	38.015556	0.125	0.125	0.188	Tishkoff et al. 2006 [see also Ranciaro et al. 2014]
73	**Gabra**	Afro-Asiatic	Pastoralist	9	Kenya	3.316667	37.066667	0	0.111	0.278	Tishkoff et al. 2006 [see also Ranciaro et al. 2014]
74	**Garreh**	Afro-Asiatic	Pastoralist	19	Kenya	3.473056	39.243333	0	0.079	0.158	Ranciaro et al. 2014
75	**Orma**	Afro-Asiatic	Pastoralist	24	Kenya	-2.3858	40.43792	0.229	0.021	0.125	Ranciaro et al. 2014
76	**Rendille**	Afro-Asiatic	Pastoralist	8	Kenya	2.506111	37.581389	0.125	0.063	0.125	Tishkoff et al. 2006
77	**El Molo**	Afro-Asiatic	Fisher-Pastoralist	9	Kenya	2.833056	36.683333	0.111	0	0	Tishkoff et al. 2006
78	**Sanye**	Afro-Asiatic	Hunter-gatherer	14	Kenya	-	-	0.036	0	0.071	Ranciaro et al. 2014
79	**Burji**	Afro-Asiatic	Agropastoralist	8	Kenya	-3.21748	40.1191	0.063	0	0	Tishkoff et al. 2006
80	**Somali**	Afro-Asiatic	Pastoralists	1	Kenya	1	38	0	0	0.5	Tishkoff et al. 2006

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81	**Somali**	Afro-Asiatic	Pastoralists	107	Ethiopia	9.6833	41.85				Ingram et al. 2009
82	**Wata**	Afro-Asiatic	Hunter-gatherer	1	Kenya	3.316667	37.066667	0	0	0	Tishkoff et al. 2006
83	**Yaaku**	Afro-Asiatic	Hunter-gatherer/ Pastoralist	14	Kenya	0.449722	37.176111	0.536	0.042	0	Tishkoff et al. 2006
84	**Maasai**	Nilo-Saharan	Pastoralist	32	Kenya	0.433333	37.144167	0.578	0.031	0	Tishkoff et al. 2006
85	**Luo**	Nilo-Saharan	Fishermen/ Farming	22	Kenya	-0.11472	34.531111	0.045	0	0	Ranciaro et al. 2014
86	**Pokot**	Nilo-Saharan	Pastoralist	14	Kenya	0.683333	36.090278	0.286	0	0.036	Tishkoff et al. 2006
87	**Pokomo**	Niger-Kordofanian	Farmer	7	Kenya	-3.21748	40.1191	0	0	0	Ranciaro et al. 2014
88	**Pare**	Niger-Kordofanian	Agropastoralist	18	Kenya	-3.48306	37.761389	0.194	0	0	Ranciaro et al. 2014

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89	**Taita**	Niger-Kordofanian	Farmer	10	Kenya	-3.40306	38.2875	0.10	0	0	Ranciaro et al. 2014
90	**Samburu**	Nilo-Saharan	Pastoralist	9	Kenya	1.09679	36.69799	0.278	0.063	0.056	Tishkoff et al. 2006
91	**Nandi**	Nilo-Saharan	Agropastoralist	4	Kenya	0.1066	35.18378	0.25	0	0	Tishkoff et al. 2006
92	**Marakwet**	Nilo-Saharan	Agropastoralist	6	Kenya	1.086111	35.256667	0.357	0	0.071	Tishkoff et al. 2006
93	**Ogiek**	Nilo-Saharan	Hunter-gatherer/ Pastoralist	11	Kenya	-0.36917	35.825556	0.364	0	0	Tishkoff et al. 2006
94	**Sabaot**	Nilo-Saharan	Agropastoralist	6	Kenya	1.086111	35.256667	0.167	0	0	Tishkoff et al. 2006
95	**Sengwer**	Nilo-Saharan	Pastoralist	16	Kenya	1.086111	35.256667	0.063	0	0	Tishkoff et al. 2006
96	**Tugen**	Nilo-Saharan	Agropastoralist	16	Kenya	0.516389	35.850556	0.188	0	0	Tishkoff et al. 2006
97	**Turkana**	Nilo-Saharan	Pastoralist	13	Kenya	0.483333	35.994722	0.208	0	0	Tishkoff et al. 2006

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98	**Kikuyu**	Niger-Kordofanian	Agriculturist	2	Kenya	-0.7189	37.14958	0.75	0	0	Tishkoff et al. 2006
99	**Iraqw**	Afro-Asiatic	Agropastoralist	39	Tanzania	-3.51667	35.378889	0.577	0	0	Tishkoff et al. 2006 [see also Ranciaro et al. 2014]
100	**Barunga**	Afro-Asiatic	Agropastoralist	18	Tanzania	-5.23333	35.91667	0.382	0	0	Tishkoff et al. 2006 [see also Ranciaro et al. 2014]
101	**Mbugu**	Afro-Asiatic	Agropastoralist	30	Tanzania	-4.84505	38.42697	0.31	0	0	Tishkoff et al. 2006 [see also Ranciaro et al. 2014]
102	**Fiome**	Afro-Asiatic	Agropastoralist	12	Tanzania	-4.42389	35.680278	0.55	0	0	Tishkoff et al. 2006 [see also Ranciaro et al. 2014]
103	**Akie**	Nilo-Saharan	Hunter-gatherer/pastoralist	14	Tanzania	-5.28556	37.383056	0.25	0	0	Tishkoff et al. 2006 [see also Ranciaro et al. 2014]
104	**Datoga**	Nilo-Saharan	Pastoralist	4	Tanzania	-3.7	35.168333	0.625	0	0	Tishkoff et al. 2006 [see also Ranciaro et al. 2014]

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105	**Dorobo**	Nilo-Saharan	Hunter-gatherer/pastoralist	10	Tanzania	-2.98333	34.85	0.4	0	0	Tishkoff et al. 2006 [see also Ranciaro et al. 2014]
106	**Maasai**	Nilo-Saharan	Pastoralist	17	Tanzania	-2.26667	34.85	0.447	0	0	Tishkoff et al. 2006 [see also Ranciaro et al. 2014]
107	**Hadza**	Khoe-San	Hunter-gatherer	18	Tanzania	-3.68333	35.166667	0	0	0	Tishkoff et al. 2006 [see also Ranciaro et al. 2014]
108	**Sandawe**	Khoe-San	Hunter-gatherer [recent change to pastoralism]	30	Tanzania	-5	35.75	0.133	0	0	Tishkoff et al. 2006 [see also Ranciaro et al. 2014]
109	**Chagga**	Narro Bantu [Niger-Congo]	Agropastoralist	86 [chromosomes]	Tanzania	-5.38	38.05	0.283	0	0	Jones et al. 2015
110	**Afar**	Afro-Asiatic - Cushitic	pastoralist	144 [chromosomes]	Ethiopia	11.56361	41.4394444	0.649*	0.649*	0.649	Jones et al. 2015
111	**Amhara**	Afro-Asiatic - Semitic	Pastoralist	142 [chromosomes]	Ethiopia	9.87	38.66	0.305*	0.305*	0.305	Jones et al. 2015

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112	**Maale**	Afro-Asiatic Omotic	Pastoralist	122 [chromosomes]	Ethiopia	5.71	36.64	0.242*	0.242*	0.242	Jones et al. 2015
113	**Oromo**	Afro-Asiatic Cushitic	Pastoralist	148 [chromosomes]	Ethiopia	7.84	37.31	0.407*	0.407*	0.407	Jones et al. 2015
114	**Suri**	Nilo-Saharan	Pastoralist	84 [chromosomes]	Ethiopia	7	35.59	0.257	0	0	Jones et al. 2015

2.2 Appendix 2: The southern African linguistic dataset (Dataset 2): methods and materials

Materials

The southern African language dataset was compiled using reference material available online through glottolog.org and ethnologue.com. These databases of world languages provided maps to locate the areas of present – day distributions of different language groups. Glottolog and Ethnologue provide a classification for western and eastern Bantu-language speakers based on Guthrie's classification scheme. Other reference material was also consulted to validate and/or confirm the classification and distribution of different language speakers. These additional sources for Bantu-languages are listed:

1. Maho (2003) provided the latest and updated version of Malcolm Guthrie's classification of the Bantu-languages.
2. Gabriele Sommer (2003) provided classification of western savanna Bantu-languages.
3. Nurse and Phillipson (2003) provided an overview of western, west-central, eastern (savanna) Bantu-languages.
4. Bostoen (2007) provided a break-down of western Bantu-languages from Zambia and the influences of Eastern Bantu.

A further two sources were used to compile the dataset on Khoesan languages. These sources are:

1. Güldemann and Vossen (2000) whom provided an overview for the classification of Khoesan languages.
2. Güldemann (2008) presents a classification of Khoesan languages.

Type of information captured in the dataset for Bantu-languages:

1. Guthrie/Maho code
2. Guthrie Zone
3. Language
4. Classification (i.e. Eastern Bantu-language speaker/Western-Bantu-language speaker)
5. Classification Code (i.e. E – Eastern or W – Western, for example)
6. Additional sources/references
7. Notes (i.e. additional information collected from supporting references).

8. Country in which language is spoken.
9. General area description (refers to provinces or areas where languages are spoken).
10. Geographic co-ordinates.

Type of information captured for Khoesan languages:

1. Code (A, B, C, or D as according to Güldemann and Vossen 2000 and Güldemann 2008)
2. Dialect
3. Group [i.e. northern Khoekhoe, southern Khoekhoe etc.)
4. Language family

Geographic Information

Geographic co-ordinates are approximations for where each linguistic group is located. This information is provided by published maps and online database.

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2.2.1. Dataset 2. The Southern African Linguistic Dataset

Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
K402	K	Fwe/We (Subiya Group)	SIL - Ethnologue and Maho (2003)	Western/South Western	W	Packendorf et al. 2017	Namibia	Caprivi	17°46'50.92"S; 24°39'24.03"E
K42/K40	K	Subia, Ikuhane (Subiya Group)	SIL - Ethnologue and Maho (2003)	Western	W		Botswana	northern near Caprivi	17°57'35.62"S; 24°47'40.03"E
K42/K40	K	Subia, Ikuhane (Subiya Group)	SIL - Ethnologue and Maho (2003)	Western	W		Zambia	Western, near Caprivi	17°27'19.76"S; 24°35'9.35"E
K41	K	Totela (Subiya group)	SIL - Ethnologue and Maho (2003)	Western	W or EB?		Zambia	Western Province	16°57'S, 24°23'E
K11	K	Chokwe (K10 - Chokwe - Luchazi Group)	SIL, Glottolog, Maho (2003)	Westcentral (Glottolog); Western Savanna (Sommer 2003)	WS/WC		Angola	Mostly Lunda North and South	9°40'S, 21°24'E
K11	K	Chokwe (K10 - Chokwe - Luchazi Group)	SIL, Glottolog, Maho (2003)	Westcentral (Glottolog); Western Savanna (Sommer 2003)	WS/WC	Bostoen (2007)	Zambia	North-West Province	13° 3'49.77"S; 24°28'31.64"E

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2.2.1. Dataset 2. The Southern African Linguistic Dataset

Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
K12a	K	Luimbi (K10 - Chokwe - Luchazi Group)	SIL, Maho (2003)	Western Savanna	WS		Angola	near Capanda District, Malanje South and Bie North provinces	11°21'57.53"S; 17°36'45.45"E
K13	K	Luchazi, Lujazi, Ponda (K10 - Chondwe)	SIL, Maho (2003)	Western Savanna (Sommer 2003), Westcentral (Glottolog)	WS/WC		Angola	Moxico Province	13°34'11.42"S; 20°22'10.98"E
K13	K	Luchazi, Lujazi, Ponda (K10 - Chondwe)	SIL, Maho (2003)	Western Savanna (Sommer 2003), Westcentral (Glottolog)	WS/WC	Bostoen (2007)	Zambia	North-Western Province	13°26'58.19"S; 23°59'19.52"E
H21	H	Mbundu cluster, Kimbundu	SIL - Ethnologue and Maho (2003)	Westcentral	WC		Angola	Cuanza North, Luanda and parts of Bengo	8°44'25.29"S; 14°46'20.33"E
K12b	K	Luimbi	SIL, Maho (2003)	Westcentral (Glottolog); Western	WS/WC		Angola	Mostly Cuando Cubango	15°43'S, 18°15'E

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2.2.1. Dataset 2. The Southern African Linguistic Dataset

Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
				Savanna (Sommer 2003)				Province but also Cunene	
K14	K	Luvale, Lwena	SIL, Maho (2003), Glottolog)	Westcentral (Glottolog); Western Savanna (Sommer 2003)	WS/WC		Zambia, Angola	Western Province (Zambia), Moxico Province (Angola)	14°24'26.93"S; 23°16'44.68"E; 17° 5'43.94"S; 23°16'43.41"E
K14	K	Luvale, Lwena	SIL, Maho (2003), Glottolog)	Westcentral (Glottolog); Western Savanna (Sommer 2003)	WS/WC		Zambia, Angola	Western Province (Zambia), Moxico Province (Angola)	14°24'26.93"S; 23°16'44.68"E; 17° 5'43.94"S; 23°16'43.41"E
K17	K	Mbwela	SIL, Maho (2003), Glottolog)	Westcentral (Glottolog); Western Savanna (Sommer 2003)	WS/WC		Angola	Bie Provinces and parts of Cuando Cubango and Moxico Provinces	12°59'50.20"S; 17°41'45.65"E

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2.2.1. Dataset 2. The Southern African Linguistic Dataset

Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
K18	K	Nkangala	Sil, Maho (2003)	Western Savanna (Sommer 2003)	WS		Angola	Moxico Province	13°22'52.88"S; 18°57'33.70"E
K15	K	Mbunda (Mbuunda)	Sil, Maho (2003)	Westcentral (Glottolog); Western Savanna (Sommer 2003)	WS/WC	Bostoen (2007)	Angola and Zambia	Moxico Province (Angola) and NorthWestern Province (Zambia)	14°23'53.13"S; 22° 0'2.32"E
K15	K	Mbunda (Mbuunda)	Sil, Maho (2003)	Westcentral (Glottolog); Western Savanna (Sommer 2003)	WS/WC		Zambia	North-Western Province	13°20'34.84"S; 23°25'31.42"E
K15	K	Mbunda (Mbuunda)	Sil, Maho (2003)	Westcentral (Glottolog); Western Savanna (Sommer 2003)	WS/WC		Zambia	Western Province	16°20'44.94"S; 23°45'2.94"E
K16	K	Nyengo	Sil, Maho (2003)	Western Savanna (Sommer 2003)	WS		Angola	Cuanda Cubango Province	17°10'33.30"S; 22°23'54.24"E

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2.2.1. Dataset 2. The Southern African Linguistic Dataset

Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
L41	L	Kaonde, Kahonde	Sil, Maho (2003)	Western	W		Zambia	Noth Western Province	13° 1'25.64"S; 25°48'57.63"E
L41	L	Kaonde, Kahonde	Sil, Maho (2003)	Western	W		Zambia	North Western Province	15° 1'2.67"S; 26°38'57.98"E
M64	M	Tonga cluster (M60 Lenje - Tonga Group)	Glottolog, SIL-Ethnologue	South West Bantu and East Bantu (Bostoen 2007) East Bantu (Glottolog)	SWB/EB or just EB	Bostoen (2007)	Zambia and Zimbabwe	Southern Province (Zambia), Western Province (Zambia); Matabeleland North, parts of M. West (Zimbabwe)	16°46'46.16"S; 27° 2'53.88"E; 17°20'57.76"S; 23°49'11.98"E 17°46'26.44"S; 27°45'31.57"E
M64	M	Tonga cluster (M60 Lenje - Tonga Group)	Glottolog, SIL-Ethnologue	South West Bantu and East Bantu (Bostoen 2007) East Bantu (Glottolog)	SWB/EB or just EB	Bostoen (2007)	Zambia and Zimbabwe	Southern Province (Zambia), Western Province (Zambia); Matabeleland North, parts of	16°46'46.16"S; 27° 2'53.88"E; 17°20'57.76"S; 23°49'11.98"E 17°46'26.44"S; 27°45'31.57"E

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2.2.1. Dataset 2. The Southern African Linguistic Dataset

Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
								M. West (Zimbabwe)	
M64	M	Tonga cluster (M60 Lenje - Tonga Group)	Glottolog, SIL-Ethnologue	South West Bantu and East Bantu (Bostoen 2007) East Bantu (Glottolog)	SWB/EB or just EB	Bostoen (2007)	Zambia and Zimbabwe	Southern Province (Zambia), Western Province (Zambia); Matabeleland North, parts of M. West (Zimbabwe)	16°46'46.16"S; 27° 2'53.88"E; 17°20'57.76"S; 23°49'11.98"E 17°46'26.44"S; 27°45'31.57"E

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2.2.1. Dataset 2. The Southern African Linguistic Dataset

Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
R41/R41A/R41B	R	Yeyi (R40 Yeyi Group)	Glottolog, SIL-Ethnologue, Maho (2003)	South West Bantu	SWB	Packendorf et al. 2017	Botswana, Namibia (Caprivi)	Okavango Delta (Botswana); Caprivi (Namibia	18°57'13.75"S; 22°48'6.65"E; 18° 1'15.80"S; 23°57'3.47"E
R41/R41A/R41B	R	Yeyi (R40 Yeyi Group)	Glottolog, SIL-Ethnologue, Maho (2003)	South West Bantu	SWB	Packendorf et al. 2017	Botswana, Namibia (Caprivi)	Okavango Delta (Botswana); Caprivi (Namibia	18°57'13.75"S; 22°48'6.65"E; 18° 1'15.80"S; 23°57'3.47"E

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2.2.1. Dataset 2. The Southern African Linguistic Dataset

Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
R31/R311	R	Herero (Ochiherero, Oluherero, Otshiherero, Ovaherero) , Himba (R30 Herero Group)	Glottolog, SIL-Ethnologue, Maho (2003),Sommer (2003)	Western Savanna (Sommer 2003); Central - Western Bantu (Glottolog);	WS/WC/W		Namibia, Botswana, Angola	Omaheke and Otjozondjupa Provinces (Namibia) and Kunene Province (Namibia); Ngamiland East (Botswana); Namibe (Angola)	20°38'41.10"S; 19°21'29.90"E, 19°44'23.62"S; 22°54'47.63"E, 18°41'54.97"S; 14°16'0.08"E; 16°46'59.62"S; 12° 5'47.21"E; 17° 9'28.13"S; 14° 8'2.04"E
R31/R311	R	Herero (Ochiherero, Oluherero, Otshiherero, Ovaherero) , Himba (R30 Herero Group)	Glottolog, SIL-Ethnologue, Maho (2003),Sommer (2003)	Western Savanna (Sommer 2003); Central - Western Bantu (Glottolog);	WS/WC/W		Namibia, Botswana, Angola	Omaheke and Otjozondjupa Provinces (Namibia) and Kunene Province (Namibia); Ngamiland East (Botswana); Namibe (Angola)	20°38'41.10"S; 19°21'29.90"E, 19°44'23.62"S; 22°54'47.63"E, 18°41'54.97"S; 14°16'0.08"E; 16°46'59.62"S; 12° 5'47.21"E; 17° 9'28.13"S; 14° 8'2.04"E

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2.2.1. Dataset 2. The Southern African Linguistic Dataset

Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
R31/R311	R	Herero (Ochiherero, Oluherero, Otshiherero, Ovaherero) , Himba (R30 Herero Group)	Glottolog, SIL-Ethnologue, Maho (2003),Sommer (2003)	Western Savanna (Sommer 2003); Central - Western Bantu (Glottolog);	WS/WC/W		Namibia, Botswana, Angola	Omaheke and Otjozondjupa Provinces (Namibia) and Kunene Province (Namibia); Ngamiland East (Botswana); Namibe (Angola)	20°38'41.10"S; 19°21'29.90"E, 19°44'23.62"S; 22°54'47.63"E, 18°41'54.97"S; 14°16'0.08"E; 16°46'59.62"S; 12° 5'47.21"E; 17° 9'28.13"S; 14° 8'2.04"E
R31/R311	R	Herero (Ochiherero, Oluherero, Otshiherero, Ovaherero) , Himba (R30 Herero Group)	Glottolog, SIL-Ethnologue, Maho (2003),Sommer (2003)	Western Savanna (Sommer 2003); Central - Western Bantu (Glottolog);	WS/WC/W		Namibia, Botswana, Angola	Omaheke and Otjozondjupa Provinces (Namibia) and Kunene Province (Namibia); Ngamiland East (Botswana); Namibe (Angola)	20°38'41.10"S; 19°21'29.90"E, 19°44'23.62"S; 22°54'47.63"E, 18°41'54.97"S; 14°16'0.08"E; 16°46'59.62"S; 12° 5'47.21"E; 17° 9'28.13"S; 14° 8'2.04"E

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2.2.1. Dataset 2. The Southern African Linguistic Dataset

Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
R31/R311	R	Herero (Ochiherero, Oluherero, Otshiherero, Ovaherero) , Himba (R30 Herero Group)	Glottolog, SIL-Ethnologue, Maho (2003),Sommer (2003)	Western Savanna (Sommer 2003); Central - Western Bantu (Glottolog);	WS/WC/W		Namibia, Botswana, Angola	Omaheke and Otjozondjupa Provinces (Namibia) and Kunene Province (Namibia); Ngamiland East (Botswana); Namibe (Angola)	20°38'41.10"S; 19°21'29.90"E, 19°44'23.62"S; 22°54'47.63"E, 18°41'54.97"S; 14°16'0.08"E; 16°46'59.62"S; 12° 5'47.21"E; 17° 9'28.13"S; 14° 8'2.04"E
R 22	R	Ndonga (Ambo, Ochindonga, Osindonga, Otjiwambo, Owambo) (R20 Ambo/(Ndonga))		South West Bantu (Bostoen 2007); West Central (Glottolog), Western Savanna (Sommer 2003)	SWB, WS, WC		Namibia; Angola	Omusati Province (Namibia), Oshikoto (Namibia), Cuanda Cubango Province (Angola)	18° 3'15.80"S; 14°57'12.90"E; 18° 5'55.11"S; 17° 8'21.61"E; 17°17'11.33"S; 21°31'38.06"E

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2.2.1. Dataset 2. The Southern African Linguistic Dataset

Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
R 22	R	Ndonga (Ambo, Ochindonga, Osindonga, Otjiwambo, Owambo) (R20 Ambo/(Ndonga))		South West Bantu (Bostoen 2007); West Central (Glottolog), Western Savanna (Sommer 2003)	SWB, WS, WC		Namibia; Angola	Omusati Province (Namibia), Oshikoto (Namibia), Cuanda Cubango Province (Angola)	18° 3'15.80"S; 14°57'12.90"E; 18° 5'55.11"S; 17° 8'21.61"E; 17°17'11.33"S; 21°31'38.06"E
R 22	R	Ndonga (Ambo, Ochindonga, Osindonga, Otjiwambo, Owambo) (R20 Ambo/(Ndonga))		South West Bantu (Bostoen 2007); West Central (Glottolog), Western Savanna (Sommer 2003)	SWB, WS, WC		Namibia; Angola	Omusati Province (Namibia), Oshikoto (Namibia), Cuanda Cubango Province (Angola)	18° 3'15.80"S; 14°57'12.90"E; 18° 5'55.11"S; 17° 8'21.61"E; 17°17'11.33"S; 21°31'38.06"E

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Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
R 21	R	Kwanyama (Cuanhama, Humba, Kuanjama, Kwancama, Kwanjama, Kwanyama, Ochikwanyama, Oshikuanjama, Ovambo, Oxikuanyama, Wambo, Oshiwambo) *R20 Ambo Group	Maho (2003); SIL-Ethnologue, Bostoen (2007)	South West Bantu	SWB		Angola	Cunene Province (Angola), Etosha Pan, Kavango, Oshikoto, Ohangwena (Namibia)	17° 6'18.23"S; 16°36'16.79"E; 18°53'7.57"S; 17°10'39.87"E
R 21	R	Kwanyama (Cuanhama, Humba, Kuanjama, Kwancama, Kwanjama, Kwanyama, Ochikwanyama, Oshikuanjama, Ovambo, Oxikuanyama, Wambo, Oshiwambo) *R20 Ambo Group	Maho (2003); SIL-Ethnologue, Bostoen (2007)	South West Bantu	SWB		Angola	Cunene Province (Angola), Etosha Pan, Kavango, Oshikoto, Ohangwena (Namibia)	17° 6'18.23"S; 16°36'16.79"E; 18°53'7.57"S; 17°10'39.87"E

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Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
R 11	R	Mbundu (Umbundu, Kimbari, M'bundo, Mbali, Mbari, Mbundu, Mbundu Benguella, Nano, Olumbali, Ovimbundu, South Mbundu, Umbundo)(R10, Umbundu Group)		Western Central (Glottolog); SWB (Bostoen (2007); Western Savanna (Sommer 2003)	SWB/WC/WS		Angola	Huambo Province (Angola)	12°32'55.89"S; 15°17'18.19"E
R 12	R	Ndombe (Dombe),(R10 Umbundu Group)	Maho (2003); SIL-Ethnologue,	South West Bantu? (Bostoen 2007); WC (Glottolog)	SWB/WC		Angola	Baia Farte (Angola)	12°56'59.78"S; 13° 5'57.92"E

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Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
K333	K	Mbukushu (Thimbukushu, Gova, Hambukushu, Kusso, Mambukush, Mampukush, Mbukuhu, Mbukushi, Sempukushu)	Maho (2003); SIL-Ethnologue, Sommer (2003), Glottolog	South West Bantu with East Bantu(Bostoen 2007); Central West Bantu (Glottolog); Western Savanna (Sommer 2003)	SWB and EB/WS/WC	Bostoen 2007	Botswana and Namibia, Angola	Okavango Pan Handle (Namibia, Botswana); Cuando Cunbango (Angola)	18°24'51.47"S; 22° 1'26.74"E; 17°49'5.85"S; 21°34'37.95"E' 17°12'31.56"S; 22° 4'6.37"E, 16°45'50.79"S; 22°19'59.40"E
K333	K	Mbukushu (Thimbukushu, Gova, Hambukushu, Kusso, Mambukush, Mampukush, Mbukuhu, Mbukushi, Sempukushu)	Maho (2003); SIL-Ethnologue, Sommer (2003), Glottolog	South West Bantu with East Bantu(Bostoen 2007); Central West Bantu (Glottolog); Western Savanna (Sommer 2003)	SWB and EB/WS/WC	Bostoen 2007	Botswana and Namibia, Angola	Okavango Pan Handle (Namibia, Botswana); Cuando Cunbango (Angola)	18°24'51.47"S; 22° 1'26.74"E; 17°49'5.85"S; 21°34'37.95"E' 17°12'31.56"S; 22° 4'6.37"E, 16°45'50.79"S; 22°19'59.40"E

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Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
K333	K	Mbukushu (Thimbukushu, Gova, Hambukushu, Kusso, Mambukush, Mampukush, Mbukuhu, Mbukushi, Sempukushu)	Maho (2003); SIL-Ethnologue, Sommer (2003), Glottolog	South West Bantu with East Bantu(Bostoen 2007); Central West Bantu (Glottolog); Western Savanna (Sommer 2003)	SWB and EB/WS/WC	Bostoen 2007	Botswana and Namibia, Angola	Okavango Pan Handle (Namibia, Botswana); Cuando Cunbango (Angola)	18°24'51.47"S; 22° 1'26.74"E; 17°49'5.85"S; 21°34'37.95"E' 17°12'31.56"S; 22° 4'6.37"E, 16°45'50.79"S; 22°19'59.40"E
K333	K	Mbukushu (Thimbukushu, Gova, Hambukushu, Kusso, Mambukush, Mampukush, Mbukuhu, Mbukushi, Sempukushu)	Maho (2003); SIL-Ethnologue, Sommer (2003), Glottolog	South West Bantu with East Bantu(Bostoen 2007); Central West Bantu (Glottolog); Western Savanna (Sommer 2003)	SWB and EB/WS/WC	Bostoen 2007	Botswana and Namibia, Angola	Okavango Pan Handle (Namibia, Botswana); Cuando Cunbango (Angola)	18°24'51.47"S; 22° 1'26.74"E; 17°49'5.85"S; 21°34'37.95"E' 17°12'31.56"S; 22° 4'6.37"E, 16°45'50.79"S; 22°19'59.40"E

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Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
K34	K	Mashi (Kwamashi, Masi)(K30 Luyana)	Glottolog, SIL-Ethnologue, Sommer 2003, Boestoen 2007)	South West Bantu with East Bantu (Bostoen); Western Savanna (Sommer 2003); West Central (Glottolog)	SWB and EB/WS/WC		Angola and Zambia	Cuanda Cubango Province (Angola); Western Province (Zambia)	15°55'27.47"S; 21°57'3.77"E; 16°20'39.73"S; 22°22'2.19"E
K34	K	Mashi (Kwamashi, Masi)(K30 Luyana)	Glottolog, SIL-Ethnologue, Sommer 2003, Boestoen 2007)	South West Bantu with East Bantu (Bostoen); Western Savanna (Sommer 2003); West Central (Glottolog)	SWB and EB/WS/WC		Angola and Zambia	Cuanda Cubango Province (Angola); Western Province (Zambia)	15°55'27.47"S; 21°57'3.77"E; 16°20'39.73"S; 22°22'2.19"E

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Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
K21	K	Lozi	Glottolog, SIL-Ethnologue,, Boestoen 2007); Maho (2003)	Eastern Bantu	EB	Bostoen 2007	Zambia, Zimbabwe	Western Province (Zambia), Livingstone (Zambia and Zimbabwe)	15°51'4.81"S; 23°18'11.18"E; 17°51'9.81"S; 25°49'59.01"E
K21	K	Lozi	Glottolog, SIL-Ethnologue,, Boestoen 2007); Maho (2003)	Eastern Bantu	EB	Bostoen 2007	Zambia, Zimbabwe	Western Province (Zambia), Livingstone (Zambia and Zimbabwe)	15°51'4.81"S; 23°18'11.18"E; 17°51'9.81"S; 25°49'59.01"E

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Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
S33	S	Southern Sotho (Sisutho, Souto, Suthu, Suto)	Glottolog, SIL-Ethnologue,, Boestoen 2007), Maho (2003)	South Eastern Bantu	SEB	Packendorf 2017	South Africa, Lesotho, Swaziland	Free State Province (South Africa); Lesotho, Shishelweni (Swaziland)	28°52'8.47"S; 27°43'4.64"E; 29°41'45.29"S; 28°12'4.98"E, 27°10'47.55"S; 32° 0'56.84"E
S33	S	Southern Sotho (Sisutho, Souto, Suthu, Suto)	Glottolog, SIL-Ethnologue,, Boestoen 2007), Maho (2003)	South Eastern Bantu	SEB	Packendorf 2017	South Africa, Lesotho, Swaziland	Free State Province (South Africa); Lesotho, Shishelweni (Swaziland)	28°52'8.47"S; 27°43'4.64"E; 29°41'45.29"S; 28°12'4.98"E, 27°10'47.55"S; 32° 0'56.84"E

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Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
S33	S	Southern Sotho (Sisutho, Souto, Suthu, Suto)	Glottolog, SIL-Ethnologue,, Boestoen 2007), Maho (2003)	South Eastern Bantu	SEB	Packendorf 2017	South Africa, Lesotho, Swaziland	Free State Province (South Africa); Lesotho, Shishelweni (Swaziland)	28°52'8.47"S; 27°43'4.64"E; 29°41'45.29"S; 28°12'4.98"E, 27°10'47.55"S; 32° 0'56.84"E
S32	S	Northern Sotho (S32a Pedi, Sepedi, Transvaal Sotho)	Glottolog, SIL-Ethnologue, Maho (2003)	South Eastern Bantu	SEB		South Africa	Limpopo Province	24°38'10.15"S; 29° 0'37.53"E

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Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
S31	S	Tswana (Bechuana, Beetjuans, Chuana, Chwana, Coana, Cuana, Sechuana, Secoana, Secwana, Tshwana, Setswana	Glottolog, SIL-Ethnologue, Maho (2003)	South Eastern Bantu	SEB	Pakendorf et al, 2017	South Africa, Botswana, Zimbabwe and Namibia	Widespread as lingua franca; Central district: Mahalapye and Serowe-Palapye subdistricts; Kgatleng and South East districts; Kweneng and Southern districts: east; North West district: Maun village area.	26°32'20.27"S; 25°39'53.80"E; 24°27'9.48"S, 25°37'59.81"E, 21°54'7.49"S, 29°34'12.53"E, 23°14'17.84"S, 19°47'13.82"E
S31	S	Tswana (Bechuana, Beetjuans, Chuana, Chwana, Coana, Cuana, Sechuana, Secoana, Secwana, Tshwana, Setswana	Glottolog, SIL-Ethnologue, Maho (2003)	South Eastern Bantu	SEB	Pakendorf et al, 2017	South Africa, Botswana, Zimbabwe and Namibia	Widespread as lingua franca; Central district: Mahalapye and Serowe-Palapye subdistricts; Kgatleng and South East districts; Kweneng and	26°32'20.27"S; 25°39'53.80"E; 24°27'9.48"S, 25°37'59.81"E, 21°54'7.49"S, 29°34'12.53"E, 23°14'17.84"S, 19°47'13.82"E

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Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
								Southern districts: east; North West district: Maun village area.	
S31	S	Tswana (Bechuana, Beetjuans, Chuana, Chwana, Coana, Cuana, Sechuana, Secoana, Secwana, Tshwana, Setswana	Glottolog, SIL-Ethnologue, Maho (2003)	South Eastern Bantu	SEB	Pakendorf et al, 2017	South Africa, Botswana, Zimbabwe and Namibia	Widespread as lingua franca; Central district: Mahalapye and Serowe-Palapye subdistricts; Kgatleng and South East districts; Kweneng and Southern districts: east; North West district: Maun village area.	26°32'20.27"S; 25°39'53.80"E; 24°27'9.48"S, 25°37'59.81"E, 21°54'7.49"S, 29°34'12.53"E, 23°14'17.84"S, 19°47'13.82"E

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Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
S31	S	Tswana (Bechuana, Beetjuans, Chuana, Chwana, Coana, Cuana, Sechuana, Secoana, Secwana, Tshwana, Setswana	Glottolog, SIL-Ethnologue, Maho (2003)	South Eastern Bantu	SEB	Pakendorf et al, 2017	South Africa, Botswana, Zimbabwe and Namibia	Widespread as lingua franca; Central district: Mahalapye and Serowe-Palapye subdistricts; Kgatleng and South East districts; Kweneng and Southern districts: east; North West district: Maun village area.	26°32'20.27"S; 25°39'53.80"E; 24°27'9.48"S, 25°37'59.81"E, 21°54'7.49"S, 29°34'12.53"E, 23°14'17.84"S, 19°47'13.82"E
S31d	S	Kgalagadi (Bakgalagari, Kgalagarhi, Kgalagari, Khalagari, Khalakadi, Kxhalaxadi, Qhalaxari, Sekgalagadi, Shekgalagadi, “Makgalagadi” (pej.))	Glottolog, SIL-Ethnologue, Maho (2003)	South Eastern Bantu	SEB	Pakendorf et al, 2017	Botswana	Ghanzi district: Charles Hill, Dekar, Ghanzi, Grootlaagte, Kanagas, Karakobis, Kuke, Kule, Ncojane, New Xade, and Tsotsha;	24°43'21.11"S; 22° 7'39.37"E

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Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
								Kgalagadi district: north; Kweneng district: west; Southern district; North West district: Maun and Sehitwa.	
L62	L	Nkoya, shiNkoya	Glottolog, SIL-Ethnologue, Maho (2003); Bostoen		SWB/w//EB?, WC		Zambia		14°50'37.44"S; 24°59'32.44"E

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Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
K33	K	Kwangari(li) (Kwangare, Kwangari, Rukwangari, Sikwangali, Vakwángali)	Glottolog, SIL-Ethnologue, Maho (2003)	Central Western (Glottolog); Western, Western Savanna (Sommer 2003)	W/SWB/WC/WS	Pakendorf et al, 2017	Angola and Namibia	Near Ruundu in the Kunene Region (Namibia) and adjacent area in Angola	17°54'51.49"S; 19°48'0.05"E
K332	K	Diriku, Gciriku, Dciriku, Mbogedo, Manyo, Mbogedu, Rugciriku, Shimbogedu	Glottolog, SIL-Ethnologue, Maho (2003)	Central Western (Glottolog); Western, Western Savanna (Sommer 2003)	W/SWB/WC/WS	Pakendorf et al, 2017	Angola, Namibia and Botswana	Kavango East, Kavango West, Otjozondjupa, and Zambezi regions.	19° 6'27.03"S; 22° 0'41.91"E, 17°45'37.05"S; 20°47'46.97"E, 18°34'5.44"S; 20°40'57.80"E

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Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
K332	K	Diriku, Gciriku, Dciriku, Mbogedo, Manyo, Mbogedu, Rugciriku, Shimbogedu	Glottolog, SIL-Ethnologue, Maho (2003)	Central Western (Glottolog); Western, Western Savanna (Sommer 2003)	W/SWB/WC/WS	Pakendorf et al, 2017	Angola, Namibia and Botswana	Kavango East, Kavango West, Otjozondjupa, and Zambezi regions.	19° 6'27.03"S; 22° 0'41.91"E, 17°45'37.05"S; 20°47'46.97"E, 18°34'5.44"S; 20°40'57.80"E
K332	K	Diriku, Gciriku, Dciriku, Mbogedo, Manyo, Mbogedu, Rugciriku, Shimbogedu	Glottolog, SIL-Ethnologue, Maho (2003)	Central Western (Glottolog); Western, Western Savanna (Sommer 2003)	W/SWB/WC/WS	Pakendorf et al, 2017	Angola, Namibia and Botswana	Kavango East, Kavango West, Otjozondjupa, and Zambezi regions.	19° 6'27.03"S; 22° 0'41.91"E, 17°45'37.05"S; 20°47'46.97"E, 18°34'5.44"S; 20°40'57.80"E

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Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
M63	M	Ila (Lenje-Tonga Group, M60) (Shukulumbwe, Sukulumbwe)	Glottolog, SIL-Ethnologue, Maho (2003)	Central East Bantu	CEB		Zambia	Central and Southern provinces: Kafue river west bend.	15°31'51.07"S; 26°29'25.69"E
S41	S	Xhosa (Isixhosa, Koosa, Xosa, "Cauzuh" (pej.))(S40 Nguni Group)	SIL-Ethnologue, Maho (2003)	Eastern Bantu (Glottolog)	EB (Glottolog)	Pakendorf et al. 2017, Sil-Ethnologue	South Africa, Lesotho	Eastern Cape province: east of Middelburg and Port Elizabeth; Northern Cape province: southeast Pixley ka Seme municipality; KwaZulu-Natal province: Ugu and Sisonke municipalities; Free State: border area, west of Lesotho.	31°38'23.96"S; 27°23'12.10"E; 30° 4'11.06"S, 28°42'1.24"E

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Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
S41	S	Xhosa (Isixhosa, Koosa, Xosa, “Cauzuh” (pej.))(S40 Nguni Group)	SIL-Ethnologue, Maho (2003)	Eastern Bantu (Glottolog)	EB (Glottolog)	Pakendorf et al. 2017, Sil-Ethnologue	South Africa, Lesotho	Eastern Cape province: east of Middelburg and Port Elizabeth; Northern Cape province: southeast Pixley ka Seme municipality; KwaZulu-Natal province: Ugu and Sisonke municipalities; Free State: border area, west of Lesotho.	31°38'23.96"S; 27°23'12.10"E; 30° 4'11.06"S, 28°42'1.24"E
S42	S	Zulu (Isizulu, Zunda, isiZulu)(S40 Nguni Group)	SIL-Ethnologue, Maho (2003)	Eastern Bantu	EB	Pakendorf 2017	South Africa, southern Mozambique	KwaZulu-Natal and Mpumalanga (Gert Sibande muni) provinces; northeast Free State and southeast Gauteng	28°33'34.52"S; 30°54'43.06"E, 26°43'24.38"S; 32°31'19.43"E

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Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
								provinces; Eastern Cape province: Harding area.	
S42	S	Zulu (Isizulu, Zunda, isiZulu)(S40 Nguni Group)	SIL-Ethnologue, Maho (2003)	Eastern Bantu	EB	Pakendorf 2017	South Africa, southern Mozambique	KwaZulu-Natal and Mpumalanga (Gert Sibande muni) provinces; northeast Free State and southeast Gauteng provinces; Eastern Cape province: Harding area.	28°33'34.52"S; 30°54'43.06"E, 26°43'24.38"S; 32°31'19.43"E

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Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
S61	S	Chopi (Cicopi, Copi, Shichopi, Shicopi, Shilenge, Tschopi, Txitxopi, Txopi, Xilenge, shiChop) (S60 Inhambane Group)	SIL-Ethnologue, Maho (2003)	Eastern Bantu	EB	Pakendorf et al. (2017)	Mozambique	Gaza province: coastal strip between Chidunguela and Inharrime; Inhambane province: south Zavala district; Maputo province. Center is Quissico.	24°36'20.67"S; 34°42'57.30"E
S54	S	Ronga (GiRonga, Gironga, Rhonga, ShiRonga, Shironga, XiRonga, Xirhonga)(S50, Tswa-Ronga Group)	SIL-Ethnologue, Maho (2003)	Eastern Bantu	EB	Pakendorf et al. (2017)	South Africa and Mozambique	Cidade de Maputo; Maputo province and Maputaland (South Africa)	27° 4'12.33"S; 32°34'14.19"E, 26°25'18.37"S; 32°37'56.35"E

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Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
S54	S	Ronga (GiRonga, Gironga, Rhonga, ShiRonga, Shironga, XiRonga, Xirhonga)(S50, Tswa-Ronga Group)	SIL-Ethnologue, Maho (2003)	Eastern Bantu	EB	Pakendorf et al. (2017)	South Africa and Mozambique	Cidade de Maputo; Maputo province and Maputaland (South Africa)	27° 4'12.33"S; 32°34'14.19"E, 26°25'18.37"S; 32°37'56.35"E
S43	S	Swati (Isiswazi, Ngwane, Phuthi, Swazi, Tekela, Tekeza)(S40 Nguni Group)	SIL-Ethnologue, Maho (2003)	Eastern Bantu	EB	Pakendorf et al. (2017)	Swaziland, South Africa and Mozambique		26°27'46.32"S; 31°39'31.98"E, 30°20'43.53"S; 28°13'34.63"E

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Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
S43	S	Swati (Isiswazi, Ngwane, Phuthi, Swazi, Tekela, Tekeza)(S40 Nguni Group)	SIL-Ethnologue, Maho (2003)	Eastern Bantu	EB	Pakendorf et al. (2017)	Swaziland, South Africa and Mozambique		26°27'46.32"S; 31°39'31.98"E, 30°20'43.53"S; 28°13'34.63"E
S15	S	Ndau (ChiNdau, Chindau, Cindau, Ndzawu, Njao, Sofala, Southeast Shona, chiNdau)	SIL-Ethnologue, Maho (2003)	Eastern Bantu	EB		Mozambique, South Africa	Inhambane and Gaza provinces; Manica and Sofala provinces: south of Beira.	20°16'47.75"S; 33°44'17.10"E, 19°59'21.54"S; 32°35'13.29"E

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Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
S15	S	Ndau (ChiNdau, Chindau, Cindau, Ndzawu, Njao, Sofala, Southeast Shona, chiNdau)	SIL-Ethnologue, Maho (2003)	Eastern Bantu	EB		Mozambique, South Africa	Inhambane and Gaza provinces; Manica and Sofala provinces: south of Beira.	20°16'47.75"S; 33°44'17.10"E, 19°59'21.54"S; 32°35'13.29"E
S51	S	Tshwa (Kitshwa, Sheetshwa, Shitshwa, Tshwa, Xitshwa)(S50 Tswa-Ronga Group)	SIL-Ethnologue, Maho (2003)	Eastern Bantu	EB	Pakendorf et al. (2017)	Mozambique and Zimbabwe	Gaza province: border area; Inhambane province: south of Save river. Masvingo (Zimbabwe)	21°28'41.58"S; 31°26'36.74"E, 22°21'45.99"S; 34°53'43.19"E

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2.2.1. Dataset 2. The Southern African Linguistic Dataset

Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
S51	S	Tshwa (Kitshwa, Sheetshwa, Shitshwa, Tshwa, Xitshwa)(S50 Tswa-Ronga Group)	SIL-Ethnologue, Maho (2003)	Eastern Bantu	EB	Pakendorf et al. (2017)	Mozambique and Zimbabwe	Gaza province: border area; Inhambane province: south of Save river. Masvingo (Zimbabwe)	21°28'41.58"S; 31°26'36.74"E, 22°21'45.99"S; 34°53'43.19"E
S21	S	Venda (Tshivenḓa (Tshivenda)) (S20 Venda Group)	SIL-Ethnologue, Maho (2003)	Eastern Bantu	EB		South Africa and Zimbabwe	Limpopo province.	22°21'5.75"S; 30° 4'45.72"E

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2.2.1. Dataset 2. The Southern African Linguistic Dataset

Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
S16	S	Kalanga (Bakaa, Chikalanga, Kalana, Kanana, Makalaka, Sekalaña, Wakalanga, Western Shona) (S10 Shona Group)	SIL-Ethnologue, Maho (2003)	East Bantu	EB		Zimbabwe and Botswana	Matabeleland South province: Bulilimamangwe and Matobo districts; Matabeleland North province: Tsholotsho district. Central Botswana	21° 1'59.10"S; 28°11'35.06"E, 22°16'18.18"S; 26°59'14.00"E
S16	S	Kalanga (Bakaa, Chikalanga, Kalana, Kanana, Makalaka, Sekalaña, Wakalanga, Western Shona) (S10 Shona Group)	SIL-Ethnologue, Maho (2003)	East Bantu	EB		Zimbabwe and Botswana	Matabeleland South province: Bulilimamangwe and Matobo districts; Matabeleland North province: Tsholotsho district. Central Botswana	21° 1'59.10"S; 28°11'35.06"E, 22°16'18.18"S; 26°59'14.00"E

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Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
S44	S	Ndebele (Zimbabwe)(Isinde'bele, Ndebele of Zimbabwe, Northern Ndebele, Sindebele, Tabele, Tebele)(S40 Nguni Group)	SIL-Ethnologue, Maho (2003)	East Bantu	EB	Pakendorf et al. (2017)	Zimbabwe and Botswana	Bulawayo, Matabeleland North, and Matabeleland South provinces; Midlands province: Gokwe South, Gueru, Kwekwe, Mberengwa, and Shurugwi districts.	20° 6'41.67"S; 28°43'40.93"E; 21° 9'41.78"S, 27°34'37.92"E
S44	S	Ndebele (Zimbabwe)(Isinde'bele, Ndebele of Zimbabwe, Northern Ndebele, Sindebele, Tabele, Tebele)(S40 Nguni Group)	SIL-Ethnologue, Maho (2003)	East Bantu	EB	Pakendorf et al. (2017)	Zimbabwe and Botswana	Bulawayo, Matabeleland North, and Matabeleland South provinces; Midlands province: Gokwe South, Gueru, Kwekwe, Mberengwa, and Shurugwi districts.	20° 6'41.67"S; 28°43'40.93"E; 21° 9'41.78"S, 27°34'37.92"E

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2.2.1. Dataset 2. The Southern African Linguistic Dataset

Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
S407	S	Southern Ndebele (South Africa)(S40 Nguni Group)	SIL-Ethnologue, Maho (2003)	East Bantu	EB	Pakendorf et al. (2017)	South Africa	Limpopo province.	25°18'50.75"S; 29°10'45.74"E
S53	S	Tsonga (Changana; Shangaan, Shangana, Shitsonga, Thonga, Tonga, Vatsonga)(S50 Tswa-Ronga Group)	SIL-Ethnologue, Maho (2003)	East Bantu	EB	Pakendorf et al. (2017)	Mozambique and South Africa	Limpopo and Mpumalanga provinces (South Africa) and Gaza and Maputo Provinces (Mozambique)	23°17'1.39"S; 31°33'17.31"E, 23°56'14.57"S; 30°25'37.48"E

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2.2.1. Dataset 2. The Southern African Linguistic Dataset

Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
S53	S	Tsonga (Changana; Shangaan, Shangana, Shitsonga, Thonga, Tonga, Vatsonga)(S50 Tswa-Ronga Group)	SIL-Ethnologue, Maho (2003)	East Bantu	EB	Pakendorf et al. (2017)	Mozambique and South Africa	Limpopo and Mpumalanga provinces (South Africa) and Gaza and Maputo Provinces (Mozambique)	23°17'1.39"S; 31°33'17.31"E, 23°56'14.57"S; 30°25'37.48"E
S62	S	Gitonga (S60 Inhambane Group)Bitonga, Gitonga, Guitonga, Inhambane, Shengwe, Tonga-Inhambane	SIL-Ethnologue, Maho (2003)	East Bantu	EB		Mozambique	Inhambane province: up to Morrumbane.	23°56'4.79"S; 35°12'53.76"E

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Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
S10	S	Shona Group (Chishona)	SIL-Ethnologue, Maho (2003)	East Bantu	EB		Zimbabwe, Zambia	Harare, Mashonaland Central, Mashonaland East, Mashonaland West, and Midlands provinces. Manicaland province, Nyanga district (Hwesa dialect); Mashonaland East, Mudzi and Mutoko districts (Budja dialect).	19° 0'0.00"S; 31° 0'0.00"E, 15° 5'5.82"S; 27°14'25.30"E

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2.2.1. Dataset 2. The Southern African Linguistic Dataset

Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
S10	S	Shona Group (Chishona)	SIL-Ethnologue, Maho (2003)	East Bantu	EB		Zimbabwe, Zambia	Harare, Mashonaland Central, Mashonaland East, Mashonaland West, and Midlands provinces. Manicaland province, Nyanga district (Hwesa dialect); Mashonaland East, Mudzi and Mutoko districts (Budja dialect).	19° 0'0.00"S; 31° 0'0.00"E, 15° 5'5.82"S; 27°14'25.30"E

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2.2.1. Dataset 2. The Southern African Linguistic Dataset

Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
S12	S	Zezuru (S10, Shona Group)	SIL-Ethnologue, Maho (2003)	East Bantu	EB		Botswana	near Makgadigadi Salt Pans	19°52'46.26"S; 25°55'38.04"E
S16	S	Nambya (Kalanga (S10, Shona Group)	SIL-Ethnologue, Maho (2003)	East Bantu	EB		Zimbabwe and Botswana	Matabeleland North province: primarily Hwange district; Binga and Lupane districts; Bulawayo (Zimbabwe). Near Sowa Pan (Botswana)	18°15'22.60"S; 26° 8'34.02"E; 20°49'59.36"S, 26° 9'17.14"E

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2.2.1. Dataset 2. The Southern African Linguistic Dataset

Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
S16	S	Nambya (Kalanga (S10, Shona Group)	SIL-Ethnologue, Maho (2003)	East Bantu	EB		Zimbabwe and Botswana	Matabeleland North province: primarily Hwange district; Binga and Lupane districts; Bulawayo (Zimbabwe). Near Sowa Pan (Botswana)	18°15'22.60"S; 26° 8'34.02"E; 20°49'59.36"S, 26° 9'17.14"E
S32	S	N. Sotho (Birwa Botswana)	SIL-Ethnologue, Maho (2003)	East Bantu	EB		Botswana and Zimbabwe	Central district: Bobonong subdistrict, Bobonong, Kobojango, Mathathane, Motalatau, and Semolale.	22°15'55.07"S; 28°11'43.16"E, 21°58'2.79"S; 29°32'47.08"E

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2.2.1. Dataset 2. The Southern African Linguistic Dataset

Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
S32	S	N. Sotho (Birwa Botswana)	SIL-Ethnologue, Maho (2003)	East Bantu	EB		Botswana and Zimbabwe	Central district: Bobonong subdistrict, Bobonong, Kobojango, Mathathane, Motalatau, and Semolale.	22°15'55.07"S; 28°11'43.16"E, 21°58'2.79"S; 29°32'47.08"E
K35	K	Umbundu	SIL-Ethnologue, Maho (2003)	West Central	WC/WS		Zambia and Angola	Western province: Lozi-Luyana area.	15°41'29.91"S; 22°47'45.93"E

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Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
K31	K	Luyi (Luyana (K30)	SIL-Ethnologue, Maho (2003)	West Central	WC		Zambia and Angola	Western province: east Lozi-Luyana area.	15°23'45.92"S; 23°47'45.69"E, 14°57'50.37"S; 14° 1'2.37"E
K31	K	Luyi (Luyana (K30)	SIL-Ethnologue, Maho (2003)	West Central	WC		Zambia and Angola	Western province: east Lozi-Luyana area.	15°23'45.92"S; 23°47'45.69"E, 14°57'50.37"S; 14° 1'2.37"E

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2.2.1. Dataset 2. The Southern African Linguistic Dataset

Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
K16	K	Yauma (Nyengo)(K10 Chokwe-Luchazi Group)	SIL-Ethnologue, Maho (2003)	Western	W		Zambia and Angola	Southeast, isolated enclave in Lucazi [lch] language area, Moxico province; Kuando Kubango Province, Kuando river area.	16° 2'2.07"S; 21°15'35.07"E, 14°16'1.07"S; 20°30'50.05"E; 17°27'32.32"S; 23°10'36.30"E
K16	K	Yauma (Nyengo)(K10 Chokwe-Luchazi Group)	SIL-Ethnologue, Maho (2003)	Western	W		Zambia and Angola	Southeast, isolated enclave in Lucazi [lch] language area, Moxico province; Kuando Kubango Province, Kuando river area.	16° 2'2.07"S; 21°15'35.07"E, 14°16'1.07"S; 20°30'50.05"E; 17°27'32.32"S; 23°10'36.30"E

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2.2.1. Dataset 2. The Southern African Linguistic Dataset

Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
K16	K	Yauma (Nyengo)(K10 Chokwe-Luchazi Group)	SIL-Ethnologue, Maho (2003)	Western	W		Zambia and Angola	Southeast, isolated enclave in Lucazi [lch] language area, Moxico province; Kuando Kubango Province, Kuando river area.	16° 2'2.07"S; 21°15'35.07"E, 14°16'1.07"S; 20°30'50.05"E; 17°27'32.32"S; 23°10'36.30"E
R 311	R	Dhimba/ Northwest Herero, (R30) Chimba, Dimba, Oluthimba, Oluzimba, Otjidhimba, Ovazimba, Simba, Tjimba, Zemba	SIL-Ethnologue, Maho (2003)	Western	W		Angola and Namibia	Coastal Benguela and Namibe provinces: as far as Equimina; Cunene and Huíla provinces: near Namibia border.	16°47'50.10"S; 12°52'37.10"E, 17°28'7.93"S; 13° 3'2.64"E

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2.2.1. Dataset 2. The Southern African Linguistic Dataset

Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
R 311	R	Dhimba/ Northwest Herero, (R30) Chimba, Dimba, Oluthimba, Oluzimba, Otjidhimba, Ovazimba, Simba, Tjimba, Zemba	SIL-Ethnologue, Maho (2003)	Western	W		Angola and Namibia	Coastal Benguela and Namibe provinces: as far as Equimina; Cunene and Huíla provinces: near Namibia border.	16°47'50.10"S; 12°52'37.10"E, 17°28'7.93"S; 13° 3'2.64"E
H31	H	Yaka (Iaka, Iyaka, Kiyaka)(H30 Kayaka Group)	SIL-Ethnologue, Maho (2003)	West Central	WC		Angola	Uige Province	6°59'2.28"S; 16°47'12.04"E

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Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
H16	H	Kongo cluster	SIL-Ethnologue, Maho (2003)	West Central	WC		Angola	Kinshasa province; Kongo Central province: Mbanza Manteke area; Fioti north of Boma, and scattered along Congo River from Brazzaville to its mouth.	6°50'21.98"S; 15°14'31.66"E; 7°41'42.17"S; 21°37'56.98"E
H16	H	Kongo cluster	SIL-Ethnologue, Maho (2003)	West Central	WC		Angola	Kinshasa province; Kongo Central province: Mbanza Manteke area; Fioti north of Boma, and scattered along Congo River from Brazzaville to its mouth.	6°50'21.98"S; 15°14'31.66"E; 7°41'42.17"S; 21°37'56.98"E

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Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
H22	H	Sama (Kissama, Quissama) (H20 Kimbundu Group)	SIL-Ethnologue, Maho (2003)	West Central	WC		Angola	Coastal, southern third of Bengo province: south of Luanda, Bengo Kisama; northwest Kuanza Sul province.	9°57'45.80"S; 13°57'2.20"E
R 13	R	Nyaneka (Lunyaneka, Nhaneca, Nhaneka), (R10 Umbundu Group)	SIL-Ethnologue, Maho (2003)	West Central	WC		Angola	Mainly Huíla and Namibe provinces; also Benguela and Cunene provinces.	16° 3'11.69"S; 15° 2'16.95"E

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Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
R 23	R	Kwambi (Oshikwambi; Otjiwambo, Owambo)(R20 Ambo/Ndonga Group)	SIL-Ethnologue, Maho (2003)	West Central	WC		Namibia	Oshana region; Omusati and Ohangwena regions bordering Oshana; Oshikoto region: southwest.	17°54'26.33"S; 15°45'11.32"E
L12b	L	Holu (Holo, Hongu, Kiholo, Kiholu) (L10 Pende group)	SIL-Ethnologue, Maho (2003)	West Central; Western	WC/W		Angola	Northwest Lunda Norte and northeast Malanje provinces: Kwango river area.	8°16'6.98"S; 17°38'26.18"E

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Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
H34	H	Mbangala (Bangala, Cimbangala) (H30 Kiyaka Group)	SIL-Ethnologue, Maho (2003)	West Central	WC		Angola	West Lunda Norte province; northeast Malanje province; Malanje province: Canhica area; northwest Lunda Sul and Uíge provinces: small areas east; Kahombo, Kela e Kambundi Katembu; community in Luanda.	9°14'40.75"S; 17°46'5.44"E

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Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
H24	H	Songo (Nsongo, Sungu)(H20 Kimbundu group)	SIL-Ethnologue, Maho (2003)	West Central	WC		Angola	North central, southeast of Luanda, Malanje, Kuanza Sul, Bié, and Lunda Norte provinces.	10°26'37.42"S; 16°43'29.87"E
H23	H	Bolo or Haka (Ipala, Kimbundu de Kwanza Sul, Ngoya, Pala), (H20 Kimbunud Group)	SIL-Ethnologue, Maho (2003)	West Central	WC		Angola	Kuanza Sul province: Libolo municipality southeast of Luanda.	10°22'47.06"S; 15°10'47.05"E

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Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
L52* (K?)	L?*(K)	Lunda (Chilunda) (L50 Lunda Group)	SIL-Ethnologue, Maho (2003)	West Central;	WC		Zambia, Angola and DRC	Luapula province: between Mweru and Bangweula lakes; North-Western province, northern Kabompo and Mwinilunga districts; Western province: Kabongo river area.	12° 6'17.72"S; 23°58'50.48"E, 9°54'49.54"S; 28°44'39.68"E
L52* (K?)	L?*(K)	Lunda (Chilunda) (L50 Lunda Group)	SIL-Ethnologue, Maho (2003)	West Central;	WC		Zambia, Angola and DRC	Luapula province: between Mweru and Bangweula lakes; North-Western province, northern Kabompo and Mwinilunga	12° 6'17.72"S; 23°58'50.48"E, 9°54'49.54"S; 28°44'39.68"E

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Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
								districts; Western province: Kabongo river area.	
L53	L	Ruund (Chiluwunda, Kilunda, Kiluunda, Lunda Kambove, Lunda-Kamboro, Luunda, Luwunda, Muatiamvua, Northern Lunda, Ru-unda)(L50 Lunda Group)	SIL-Ethnologue, Maho (2003)	West Central	WC		Angola and DRC	Lomami province: small border area south; Lualaba province: west.	7°23'29.61"S; 19°41'50.31"E; 8°30'3.95"S, 21°24'46.09"E

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2.2.1. Dataset 2. The Southern African Linguistic Dataset

Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
L53	L	Ruund (Chiluwunda, Kilunda, Kiluunda, Lunda Kambove, Lunda-Kamboro, Luunda, Luwunda, Muatiamvua, Northern Lunda, Ru-unda)(L50 Lunda Group)	SIL-Ethnologue, Maho (2003)	West Central	WC		Angola and DRC	Lomami province: small border area south; Lualaba province: west.	7°23'29.61"S; 19°41'50.31"E; 8°30'3.95"S, 21°24'46.09"E
H32	H	Suku (H30 Kiyaka Group)	SIL-Ethnologue, Maho (2003)	West Central	WC		Angola and DRC	Kwango province: Moanza and Mwela areas west of Feshi.	8°14'51.77"S; 18° 5'43.17"E

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Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
L31a	L	Luba-Kasai (Bena-Lulua, Ciluba, Luba-Lulua, Luva, Western Luba)(L30 Luba Group)	SIL-Ethnologue, Maho (2003)	Western	W		Angola and DRC	Kasai-Oriental; Kasai province: southeastern third; Sankuru province.	7°19'13.30"S; 20°38'34.34"E
N44/N43	N	Sena, Nyungwe, Tete (Cisena)(N40 Senga-Sena Group)	SIL-Ethnologue, Maho (2003)	East BAntu	EB		Mozambique		18°13'15.27"S; 35°36'38.13"E

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Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
S13	S	Tewe/Manyika Cluster (Chiute, Ciute, Teve, Utee, Vateve, Wateve)(S10 Shona Group)	SIL-Ethnologue, Maho (2003)	East Bantu	EB		Mozambique	Manica and Sofala provinces: Chimoio city northeast, Pungoe river north bank.	18°36'14.63"S; 34° 4'1.00"E
S13	S	Manyika Cluster (Bamanyeka, Chimanyika, Manika, Wamanyika, Wanyika) (S10 Shona Group)	SIL-Ethnologue, Maho (2003)	East Bantu	EB		Mozambique and Zimbabwe	Manicaland province: Makoni, Mutasa, Mutare, and Nyanga districts, northwest of Umtali.	18° 9'56.13"S; 33° 0'2.83"E

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Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
N44	N	Barwe (Balke, Chirue, Cibalke, Rue)(N40 Senga-Sena Group)	SIL-Ethnologue, Maho (2003)	East Bantu	EB		Mozambique	Manica province.	17°45'26.30"S; 33°32'11.56"E
N43	N	Nyungwe (Chinyungwe, Chinyungwi, Nyongwe, Teta, Tete, Yungwe (Tete)) (N40 - Senga-Sena Group)	SIL-Ethnologue, Maho (2003)	East Bantu	EB		Mozambique	Manica province: Luenha river east bank, east from Changara; Tete province: Zambezi river banks.	16°42'26.27"S; 33°37'17.42"E

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Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
P34	P	Chwabo (Chichwabo, Chuabo, Chuwabo, Chwabo, Cicuabo, Cuabo, Cuwabo, Echuabo, Echuwabo, Echuwabu, Txuwabo) (P30 Makhuwa Group).	SIL-Ethnologue, Maho (2003)	East Bantu	EB?		Mozambique	Zambezia province: central coast between Mlanje and Quelimane mountains	17°24'10.96"S; 37°15'40.95"E
P30/P31	P	Makhuwa Group (Makhuwa-Monica)(Central Makhuwa, Emakhuwa-Makhuwana, Emakua, Macua, Makhuwa-Makhuwana, Makhuwwa of Nampula, Makoane, Makua, Maquoua)	SIL-Ethnologue, Maho (2003)	East Bantu	EB		Mozambique	Nampula province: south of Meetto area; Cabo Delgado, Niassa, and Zambezia provinces: border areas.	14°36'26.21"S; 39°12'53.16"E

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Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
P31	P	Lolo (Makhuwa)	SIL-Ethnologue, Maho (2003)	East Bantu	EB		Mozambique	Zambezia province.	16°58'21.14"S; 36° 8'39.88"E
P31	P	Kokala (Makhuwa)	SIL-Ethnologue, Maho (2003)	East Bantu	EB		Mozambique and Malawi	Mulanje district; Thyolo district: Sandama area.	16°10'50.67"S; 35°38'39.79"E

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2.2.1. Dataset 2. The Southern African Linguistic Dataset

Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
P31	P	Lomwe (West Makhuwa)(Acilowe, Alomwe, Chilowe, Cilowe, Elomwe, Ilomwe, Ingulu, Lomue, Mihavane, Mihavani, Mihawani, Ngulu, Nguru, Walomwe, West Makhuwa, Western Makua)	SIL-Ethnologue, Maho (2003)	East Bantu	EB?		Mozambique	Nampula and Niassa provinces: Alto Molocue; Zambezia province	15°40'16.03"S; 37°12'33.03"E
P31	P	Takwane (Makhuwa)	SIL-Ethnologue, Maho (2003)	East Bantu	EB		Mozambique	Zambezia province.	15°56'51.13"S; 36°26'18.32"E

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2.2.1. Dataset 2. The Southern African Linguistic Dataset

Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
P31	P	Manyawa (Makhuwa)	SIL-Ethnologue, Maho (2003)	East Bantu	EB		Mozambique	Zambezia province: Lugela district.	16°32'20.78"S; 37° 0'16.64"E
P31	P	Marenje (Makhuwa)(Emarendje, Marendje)	SIL-Ethnologue, Maho (2003)				Mozambique	Zambezia province.	16°19'51.20"S; 36° 8'50.66"E

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2.2.1. Dataset 2. The Southern African Linguistic Dataset

Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
N12	N	Ngoni (Tanzania) (Angoni, Chingoni, Kingoni, Kisutu, Sutu)(N10 Manda Group)	SIL-Ethnologue, Maho (2003)	East Bantu	EB		Mozambique and Tanzania	Iringa and Morogoro regions; Ruvuma region: Songea area.	12°27'34.26"S; 38°43'4.69"E
P21	P	Yao (Achawa, Adsawa, Adsoa, Ajawa, Ayao, Ayawa, Ayo, Chiyao, Chiyawo, Ciyaawo, Ciyao, Djao, Haiao, Hiao, Hyao, Jao, Veiao, Wajao, Yawo, chiYao, ciYao, waYao) (P20 Yao group)	SIL-Ethnologue, Maho (2003)	East Bantu	EB		Mozambique and Malawi and Tanzania	Balaka, Machinga, Mangochi, and Zomba districts: bordering Mozambique, between southeast tip of Lake Kilwa and Lake Malawi; Chiradzulu district: small area. Niassa Province (Mozambique)	14°48'11.08"S; 35°49'37.56"E, 12°39'52.73"S; 36°22'12.22"E, 11°27'17.87"S; 38°36'21.76"E

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2.2.1. Dataset 2. The Southern African Linguistic Dataset

Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
P21	P	Yao (Achawa, Adsawa, Adsoa, Ajawa, Ayao, Ayawa, Ayo, Chiyao, Chiyawo, Ciyaawo, Ciyao, Djao, Haiao, Hiao, Hyao, Jao, Veiao, Wajao, Yawo, chiYao, ciYao, waYao) (P20 Yao group)	SIL-Ethnologue, Maho (2003)	East Bantu	EB		Mozambique and Malawi and Tanzania	Balaka, Machinga, Mangochi, and Zomba districts: bordering Mozambique, between southeast tip of Lake Kilwa and Lake Malawi; Chiradzulu district: small area. Niassa Province (Mozambique)	14°48'11.08"S; 35°49'37.56"E, 12°39'52.73"S; 36°22'12.22"E, 11°27'17.87"S; 38°36'21.76"E
P21	P	Yao (Achawa, Adsawa, Adsoa, Ajawa, Ayao, Ayawa, Ayo, Chiyao, Chiyawo, Ciyaawo, Ciyao, Djao, Haiao, Hiao, Hyao, Jao, Veiao, Wajao, Yawo, chiYao, ciYao, waYao) (P20 Yao group)	SIL-Ethnologue, Maho (2003)	East Bantu	EB		Mozambique and Malawi and Tanzania	Balaka, Machinga, Mangochi, and Zomba districts: bordering Mozambique, between southeast tip of Lake Kilwa and Lake Malawi;	14°48'11.08"S; 35°49'37.56"E, 12°39'52.73"S; 36°22'12.22"E, 11°27'17.87"S; 38°36'21.76"E

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2.2.1. Dataset 2. The Southern African Linguistic Dataset

Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
								Chiradzulu district: small area. Niassa Province (Mozambique)	
P23	P	Makonde (Chinimakonde, Kimakonde, Konde, Matambe, Matambwe, Mekwengo, Simakonde) (P20 Yao Group)	SIL-Ethnologue, Maho (2003)	East Bantu	EB		Mozambique and Tanzania	Mtwara region: Mtwara rural, Mtwara urban, Newala, and Tandahomba districts; north into Lindi region.	11°39'24.80"S; 39°32'23.75"E

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2.2.1. Dataset 2. The Southern African Linguistic Dataset

Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
N31	N	Nyanja-Chewa cluster (Chewa, Chinyanja, Nyanja, Nyanja-Chewa) (N30 Nyanja Group)	SIL-Ethnologue, Maho (2003)	East Bantu	EB		Malawi, Mozambique and Zambia	West central and southwest.	13°51'56.41"S; 34° 4'34.55"E, 12°27'26.50"S; 35°10'25.13"E; 12° 4'35.04"S; 34°44'6.02"E, 15°55'6.71"S; 35°17'37.73"E, 14°52'53.01"S; 33°22'8.05"E, 13°22'23.06"S; 32°43'7.55"E

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2.2.1. Dataset 2. The Southern African Linguistic Dataset

Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
N31	N	Nyanja-Chewa cluster (Chewa, Chinyanja, Nyanja, Nyanja-Chewa) (N30 Nyanja Group)	SIL-Ethnologue, Maho (2003)	East Bantu	EB		Malawi, Mozambique and Zambia	West central and southwest.	13°51'56.41"S; 34° 4'34.55"E, 12°27'26.50"S; 35°10'25.13"E; 12° 4'35.04"S; 34°44'6.02"E, 15°55'6.71"S; 35°17'37.73"E, 14°52'53.01"S; 33°22'8.05"E, 13°22'23.06"S; 32°43'7.55"E

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2.2.1. Dataset 2. The Southern African Linguistic Dataset

Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
N31	N	Nyanja-Chewa cluster (Chewa, Chinyanja, Nyanja, Nyanja-Chewa) (N30 Nyanja Group)	SIL-Ethnologue, Maho (2003)	East Bantu	EB		Malawi, Mozambique and Zambia	West central and southwest.	13°51'56.41"S; 34° 4'34.55"E, 12°27'26.50"S; 35°10'25.13"E; 12° 4'35.04"S; 34°44'6.02"E, 15°55'6.71"S; 35°17'37.73"E, 14°52'53.01"S; 33°22'8.05"E, 13°22'23.06"S; 32°43'7.55"E

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2.2.1. Dataset 2. The Southern African Linguistic Dataset

Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
N31	N	Nyanja-Chewa cluster (Chewa, Chinyanja, Nyanja, Nyanja-Chewa) (N30 Nyanja Group)	SIL-Ethnologue, Maho (2003)	East Bantu	EB		Malawi, Mozambique and Zambia	West central and southwest.	13°51'56.41"S; 34° 4'34.55"E, 12°27'26.50"S; 35°10'25.13"E; 12° 4'35.04"S; 34°44'6.02"E, 15°55'6.71"S; 35°17'37.73"E, 14°52'53.01"S; 33°22'8.05"E, 13°22'23.06"S; 32°43'7.55"E

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2.2.1. Dataset 2. The Southern African Linguistic Dataset

Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
N31	N	Nyanja-Chewa cluster (Chewa, Chinyanja, Nyanja, Nyanja-Chewa) (N30 Nyanja Group)	SIL-Ethnologue, Maho (2003)	East Bantu	EB		Malawi, Mozambique and Zambia	West central and southwest.	13°51'56.41"S; 34° 4'34.55"E, 12°27'26.50"S; 35°10'25.13"E; 12° 4'35.04"S; 34°44'6.02"E, 15°55'6.71"S; 35°17'37.73"E, 14°52'53.01"S; 33°22'8.05"E, 13°22'23.06"S; 32°43'7.55"E

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2.2.1. Dataset 2. The Southern African Linguistic Dataset

Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
N31	N	Nyanja-Chewa cluster (Chewa, Chinyanja, Nyanja, Nyanja-Chewa) (N30 Nyanja Group)	SIL-Ethnologue, Maho (2003)	East Bantu	EB		Malawi, Mozambique and Zambia	West central and southwest.	13°51'56.41"S; 34° 4'34.55"E, 12°27'26.50"S; 35°10'25.13"E; 12° 4'35.04"S; 34°44'6.02"E, 15°55'6.71"S; 35°17'37.73"E, 14°52'53.01"S; 33°22'8.05"E, 13°22'23.06"S; 32°43'7.55"E
P331	P	Lomwe (Anguru, Elhomwe, Nguru (Malawi)	SIL-Ethnologue	East Bantu	EB		Malawi and Mozambique	Blantyre, Machinga, Mulanje, Phalombe, Thyolo, and Zomba districts.	15°43'51.35"S; 35°39'22.53"E

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Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
N441	N	Sena Malawi, Chisena, Cisena (N40 Senga-Sena Group)	SIL-Ethnologue	East Bantu	EB		Malawi and Mozambique border	Chikwawa district: south; Nsanje district; along Mozambique border.	16°39'59.45"S; 35° 9'29.05"E
S10	S	Dema (Shona Group)	SIL-Ethnologue	East Bantu	EB		Mozambique	Tete province: near Cahora Bassa dam, north of Zimbabwe.	15°41'29.03"S; 33°21'25.62"E

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2.2.1. Dataset 2. The Southern African Linguistic Dataset

Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
S11	S	Tawara (Korekore, Maho (2003)) (Tavara, Tawala)(S10 Shona Group)	SIL-Ethnologue	East Bantu	EB		Mozambique	Tete province: south, north of Zimbabwe.	15°59'56.88"S; 31°43'26.95"E
N41	N	Nsenga (Chinsenga, Cinsenga, Senga) (N40 - Senga - Sena Group)	SIL-Ethnologue, Maho (2003)	East Bantu	EB		Mozambique, Zambia, Zimbabwe	Eastern province: Petauke district; Lusaka province: Chongwe and Luangwa districts.	16°35'53.91"S; 31°58'49.71"E, 14°42'45.08"S; 31° 7'49.21"E

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2.2.1. Dataset 2. The Southern African Linguistic Dataset

Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
N41	N	Nsenga (Chinsenga, Cinsenga, Senga) (N40 - Senga - Sena Group)	SIL-Ethnologue, Maho (2003)	East Bantu	EB		Mozambique, Zambia, Zimbabwe	Eastern province: Petauke district; Lusaka province: Chongwe and Luangwa districts.	16°35'53.91"S; 31°58'49.71"E, 14°42'45.08"S; 31° 7'49.21"E
N42	N	Kunda (Achikunda, Cikunda) (N40 Senga-Sena Group)	SIL-Ethnologue, Maho (2003)	East Bantu	EB		Zimbabwe and Zambia and Mozambique	Mashonaland Central province: Guruve district.	16° 8'30.59"S; 30°37'17.72"E, 15°31'3.46"S; 30°30'30.79"E, 15°30'54.13"S; 29°54'23.75"E, 13°33'52.06"S; 31°43'10.18"E

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Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
N42	N	Kunda (Achikunda, Cikunda) (N40 Senga-Sena Group)	SIL-Ethnologue, Maho (2003)	East Bantu	EB		Zimbabwe and Zambia and Mozambique	Mashonaland Central province: Guruve district.	16° 8'30.59"S; 30°37'17.72"E, 15°31'3.46"S; 30°30'30.79"E, 15°30'54.13"S; 29°54'23.75"E, 13°33'52.06"S; 31°43'10.18"E
N42	N	Kunda (Achikunda, Cikunda) (N40 Senga-Sena Group)	SIL-Ethnologue, Maho (2003)	East Bantu	EB		Zimbabwe and Zambia and Mozambique	Mashonaland Central province: Guruve district.	16° 8'30.59"S; 30°37'17.72"E, 15°31'3.46"S; 30°30'30.79"E, 15°30'54.13"S; 29°54'23.75"E, 13°33'52.06"S; 31°43'10.18"E

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2.2.1. Dataset 2. The Southern African Linguistic Dataset

Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
N42	N	Kunda (Achikunda, Cikunda) (N40 Senga-Sena Group)	SIL-Ethnologue, Maho (2003)	East Bantu	EB		Zimbabwe and Zambia and Mozambique	Mashonaland Central province: Guruve district.	16° 8'30.59"S; 30°37'17.72"E, 15°31'3.46"S; 30°30'30.79"E, 15°30'54.13"S; 29°54'23.75"E, 13°33'52.06"S; 31°43'10.18"E
N21	N	Tumbuka Cluster (Citumbuka, Tamboka, Tambuka, Timbuka, Tombucas, Tumboka) (N20 Tumbuka Group)	SIL-Ethnologue, Maho (2003)	East Bantu	EB		Malawi and Zambia	Chitipa and Karonga districts: Lake Malawi west shore; Nkhata Bay, Nkhotakota, Rumphi, and Mzimba districts.	11°26'2.52"S; 33°55'31.26"E, 11° 3'39.70"S; 33° 2'20.11"E
N21	N	Tumbuka Cluster (Citumbuka, Tamboka, Tambuka, Timbuka, Tombucas, Tumboka) (N20 Tumbuka Group)	SIL-Ethnologue, Maho (2003)	East Bantu	EB		Malawi and Zambia	Chitipa and Karonga districts: Lake Malawi west shore; Nkhata Bay,	11°26'2.52"S; 33°55'31.26"E, 11° 3'39.70"S; 33° 2'20.11"E

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2.2.1. Dataset 2. The Southern African Linguistic Dataset

Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
								Nkhotakota, Rumphi, and Mzimba districts.	
M31	M	Nyakyusa-Ngonde (M30 Konde Group)	SIL-Ethnologue, Maho (2003)	East Bantu	EB		Malawi and Tanzania	Mbeya region: Kyela and Rungwe districts, Lake Malawi north end; Njombe region: Makete district.	9°59'27.51"S; 33°53'40.61"E
M23	M	Nyika (Chinyika, Kinyika) or Nyiha (M20 Nyika-Safwa Group)	SIL-Ethnologue, Maho (2003)	East Bantu	EB		Malawi and Zambia	Chitipa district: Chisenga area villages; Karonga district: west.	9°52'17.55"S; 33°23'2.36"E
M201	M	Lambya or Rambia (M20 Nyika-Safwa Group)(Ichilambya, Kilambya, Lambia, Lambwa, Rambia)	SIL-Ethnologue, Maho (2003)	East Bantu	EB		Malawi, Zambia and Tanzania	Chitipa and Karonga districts: along Tanzania and Zambia borders.	9°47'21.35"S; 32°47'40.15"E, 9°42'7.52"S; 33°17'50.21"E

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Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
M201	M	Lambya or Rambia (M20 Nyika-Safwa Group)(Ichilambya, Kilambya, Lambia, Lambwa, Rambia)	SIL-Ethnologue, Maho (2003)	East Bantu	EB		Malawi, Zambia and Tanzania	Chitipa and Karonga districts: along Tanzania and Zambia borders.	9°47'21.35"S; 32°47'40.15"E, 9°42'7.52"S; 33°17'50.21"E
M301	M	Ndali (Chindali, Cindali, Ici-Ndali, Icindali, Kindali, Ndari) (M30 Konde group)	SIL-Ethnologue, Maho (2003)	East Bantu	EB		Malawi and Tanzania	Songwe region: Ileje district, between Lambya and Nyakyusa.	9°35'21.70"S; 33°19'43.02"E
M22	M	Mwanga or Namwanga (Ichinamwanga, Inamwanga, Mwanga, Namwanga) (M20 Nyika-Safwa Group)	SIL-Ethnologue, Maho (2003)	East Bantu	EB		Zambia and Tanzania	Northern province: east; Muchinga province: Chama district.	9°24'59.05"S; 32°29'15.59"E
M42	M	Bemba or Wemba (Chiwemba, Cibemba, Ichibemba, Icibemba, Wemba) (M40 Bemba Group)	SIL-Ethnologue, Maho (2003)	East Bantu	EB		DRC and Zambia	Eastern, Luapula, Muchinga, and Northern provinces; possibly Copperbelt province.	10°15'45.36"S; 31° 4'38.56"E, 11°35'7.66"S; 30° 9'29.75"E

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Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
M50	M	Biisa, Wisa, Lala Bisa (M50 Bisa-Lamba Group)(Chilala)	SIL-Ethnologue, Maho (2003)	East Bantu	EB		DRC and Zambia	Central, Eastern, Muchinga, and Northern provinces: east along Luangwa river (Bisa dialect), southwest (Lala dialect); Copperbelt province: Masaiti district.	10°17'21.22"S; 31° 7'11.16"E; 12°25'2.55"S, 30°51'5.57"E
M50	M	Biisa, Wisa, Lala Bisa (M50 Bisa-Lamba Group)(Chilala)	SIL-Ethnologue, Maho (2003)	East Bantu	EB		DRC and Zambia	Central, Eastern, Muchinga, and Northern provinces: east along Luangwa river (Bisa dialect), southwest (Lala dialect); Copperbelt province: Masaiti district.	10°17'21.22"S; 31° 7'11.16"E; 12°25'2.55"S, 30°51'5.57"E

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Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
M402	M	Aushi, Usi (M40 Bemba Group) (Avaushi, Ushi, Usi, Uzhil, Vouaousi)	SIL-Ethnologue, Maho (2003)	East Bantu	EB		DRC and Zambia	Luapula province.	11°43'8.58"S; 29°28'37.57"E
M41	M	Taabwa, Rungu Ichitaabwa, Kitabwa, Lungu, Rungu, Taabua, Tabwa, Zabwa)(M40 Bemba Group)	SIL-Ethnologue, Maho (2003)	East Bantu	EB		DRC and Zambia	anganyika province: on Lake Tanganyika, south of Moba.	8°59'1.80"S; 30°13'50.71"E
G40	G	Swahili Group (Swahili Congo -Kiswahili; Zaïre Swahili)	SIL-Ethnologue, Maho (2003)	East Bantu/ North East Savanna Bantu	EB, NESB		DRC and Zambia	Widespread in Haut-Katanga, Haut-Lomami, Ituri, Lualaba, Maniema, Nord-Kivu, Sud-Kivu, and Tanganyika provinces.	9°20'5.95"S; 29°53'11.14"E, 8°30'49.60"S; 30°23'26.27"E
G40	G	Swahili Group (Swahili Congo -Kiswahili; Zaïre Swahili)	SIL-Ethnologue, Maho (2003)	East Bantu/ North East Savanna Bantu	EB, NESB		DRC and Zambia	Widespread in Haut-Katanga, Haut-Lomami, Ituri, Lualaba, Maniema, Nord-Kivu, Sud-Kivu,	9°20'5.95"S; 29°53'11.14"E, 8°30'49.60"S; 30°23'26.27"E

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Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
								and Tanganyika provinces.	
M14	M	Rungu, Lungu, Mabwe-Lungu (Mambe-Lungu, Mambwe-Rungu) (M10 Fipa - Mambwe Group)	SIL-Ethnologue, Maho (2003)	East Bantu	EB		Tanzania and Zambia	Northern province: south of Lake Tanganyika.	9° 3'8.01"S; 31°10'39.89"E
M401	M	Bwile (M40 Bemba Group)	SIL-Ethnologue, Maho (2003)	East Bantu	EB		DRC and Zambia	Luapula province.	8°35'1.47"S; 29°13'39.09"E
M54	M	Lamba (M50 Bisa-Lamba Group) (ChiLamba, ichiLamba)	SIL-Ethnologue, Maho (2003)	East Bantu 'Corridor'	EB		Zambia and DRC	Central, Copperbelt, and North-Western provinces.	13°11'29.79"S; 28° 4'30.43"E
M61	M	Lenje (M60 Lenje-Tonga Group)(Chinamukuni, Ciina, Ciina Mukuni, Lengi, Lenji, Mukuni)	SIL-Ethnologue, Maho (2003)	East Bant (Central East Bantu)	EB		Zambia	Central province: Lukanga swamp area; Copperbelt province: border areas south; Lusaka province.	14°25'40.89"S; 28°40'25.24"E, 15°22'10.86"S; 29°28'56.59"E

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Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
M61	M	Lenje (M60 Lenje-Tonga Group)(Chinamukuni, Ciina, Ciina Mukuni, Lengi, Lenji, Mukuni)	SIL-Ethnologue, Maho (2003)	East Bant (Central East Bantu)	EB		Zambia	Central province: Lukanga swamp area; Copperbelt province: border areas south; Lusaka province.	14°25'40.89"S; 28°40'25.24"E, 15°22'10.86"S; 29°28'56.59"E
M631	M	Sala (M60 Lenje - Tonga Group)	SIL-Ethnologue, Maho (2003)	Central East Bantu	EB		Zambia	Central province; west Lusaka and Southern (Mazabuka) provinces.	15°32'43.98"S; 27°32'19.20"E
M62	M	Soli (Chisoli) (M60 Lenje - Tonga Group)	SIL-Ethnologue, Maho (2003)	Central East Bantu	EB		Zambia	Lusaka province; Central province: Mkusi district, east of Lusaka; Southern province: border areas.	15°14'14.33"S; 28°53'53.52"E

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Guthrie/Maho Code	Zone	Language	Source	Western or Eastern Bantu classification	Code	Additional Source	Country	General Area Description	Geographic co-ordinates
K32	K	Mbowe (K30 Luyana Group) (Esimbowe)	SIL-Ethnologue, Maho (2003)	West Central	WC		Zambia		14°17'4.24"S; 23°59'2.53"E

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Code	*Dialect*	*Subgroup*	*Family*	*Latitude*	*Longitude*
C	Nama	Northern KhoeKhoe	Khoe-Kwadi	-24.32897778	18.19054722
C	Nama	Northern KhoeKhoe	Khoe-Kwadi	-30.1987	17.74919444
C	Dama	Northern Khoekhoe	Khoe-Kwadi	-21.12047778	16.78188056
C	Eini*	Northern Khoekhoe	Khoe-Kwadi	0	0
C	Hai‖'om	Northern KhoeKhoe	Khoe-Kwadi	-19.72939722	19.07359167
C	ǂAakhoe	Northern KhoeKhoe	Khoe-Kwadi	0	0
C	!Ora*	Southern Khoekhoe	Khoe-Kwadi	-28.96835278	22.1789
C	Cape varieties*	Southern Khoekhoe	Khoe-Kwadi	-33.96618056	18.56590278
C	Cape varieties*	Southern Khoekhoe	Khoe-Kwadi	-33.94866944	22.04396944
	Kwadi* (single language)	Kwadi	Khoe-Kwadi	-14.97097222	12.715475
B	Deti*	Shua (Kalahari Eastern Khoe)	Khoe-Kwadi	-19.00734444	25.38378611
B	Cara	Shua (Kalahari Eastern Khoe)	Khoe-Kwadi	0	0
B	ǀXaise	Shua (Kalahari Eastern Khoe)	Khoe-Kwadi	0	0
B	Danisi	Shua (Kalahari Eastern Khoe)	Khoe-Kwadi	-20.48815278	24.72477222

Appendix 2

Dataset 2. The Southern African Linguistic Dataset

Code	*Dialect*	*Subgroup*	*Family*	*Latitude*	*Longitude*
B	Ts'ixa	Shua (Kalahari Eastern Khoe)	Khoe-Kwadi	0	0
B	Khwe	Kxoe (Kalahari West Khoe)	Khoe-Kwadi	-17.09543056	22.84316944
B	ǁAni	Kxoe (Kalahari West Khoe)	Khoe-Kwadi	-20.08897778	22.59248889
B	Buga	Kxoe (Kalahari West Khoe)	Khoe-Kwadi	0	0
B	G|anda	Kxoe (Kalahari West Khoe)	Khoe-Kwadi	0	0
B	G‖ana	G‖ana (Kalahari West Khoe)	Khoe-Kwadi	-22.73298611	24.01891111
B	G|ui	G‖ana (Kalahari West Khoe)	Khoe-Kwadi	0	0
B	ǂHaba	G‖ana (Kalahari West Khoe)	Khoe-Kwadi	0	0
B	Naro	Naro (Kalahari West Khoe)	Khoe-Kwadi	-22.07054444	21.65048611
A	ǂHoan (single language)	ǂHoan	Ju-ǂHoan	0	0
A	!O!Xuun	Ju (DC)(Northern Khoisan)	Ju-ǂHoan	-14.91971944	20.44598056
A	!O!Xuun	Ju (Northern Khoisan)	Ju-ǂHoan	-14.19596944	16.19263056
A	!Xuun	Ju (Northwest Khoisan)	Ju-ǂHoan	-18.87088333	19.66608333
A	Ju|'hoan	Ju (Southeast Khoisan)	Ju-ǂHoan	-19.55366389	21.00403889

Appendix 2

Dataset 2. The Southern African Linguistic Dataset

Code	*Dialect*	*Subgroup*	*Family*	*Latitude*	*Longitude*
A	ǂKx'au||'en	Ju (Southeast Khoisan)	Ju-ǂHoan	0	0
D	N|u||'en*	Taa (DC) West (Taa-Lower Nossob) (Southern Khoisan)	Tuu	-23.63299167	20.99643889
D	West !Xoon	Taa West (Taa-Lower Nossob) (Southern Khoisan)	Tuu	0	0
D	N|amani*	Taa East (Taa-Lower Nossob)(Southern Khoisan)	Tuu	0	0
D	Kakia*	Taa East (Taa-Lower Nossob)(Southern Khoisan)	Tuu	0	0
D	N|ohan	Taa East (Taa-Lower Nossob)(Southern Khoisan)	Tuu	0	0
D	East !Xoon	Taa East (Taa-Lower Nossob)(Southern Khoisan)	Tuu	0	0
D	|'Auni*	Lower Nossob)(Southern Khoisan)?	Tuu	0	0
D	|Haasi*	Lower Nossob)(Southern Khoisan)?	Tuu	0	0
D	|Xam (DC)	!Ui (Southern Khoisan)	Tuu	-29.38847222	19.86345833
D	N||ng (DC)	!Ui (Southern Khoisan)	Tuu	-25.57146944	21.27033611

Appendix 2

Dataset 2. The Southern African Linguistic Dataset

Code	*Dialect*	*Subgroup*	*Family*	*Latitude*	*Longitude*
D	||Xegwi*	!Ui (Southern Khoisan)	Tuu	0	0
D	ǂUngkue*	!Ui (Southern Khoisan)	Tuu	0	0

Appendix 3:

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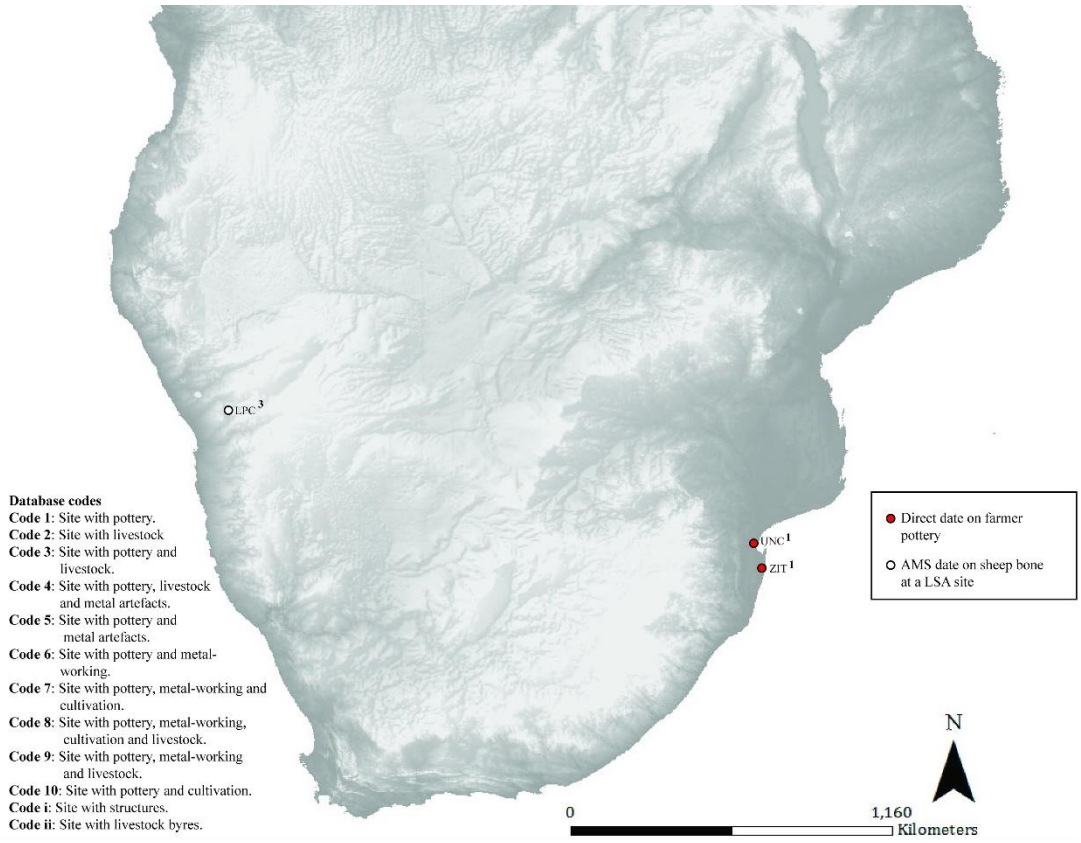
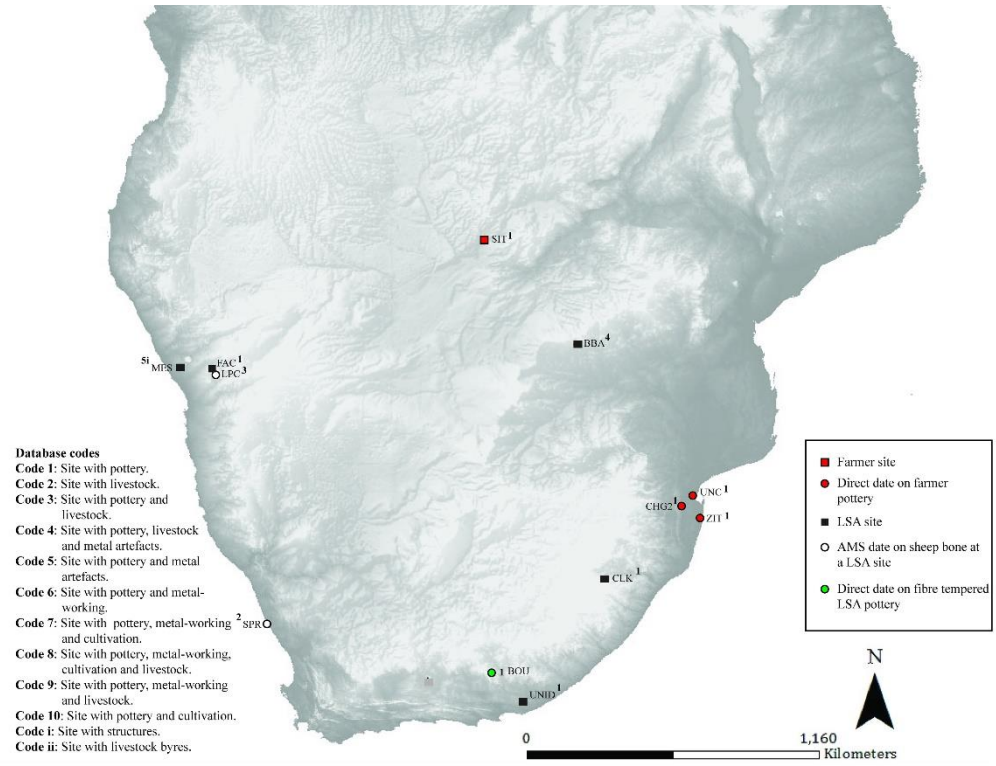


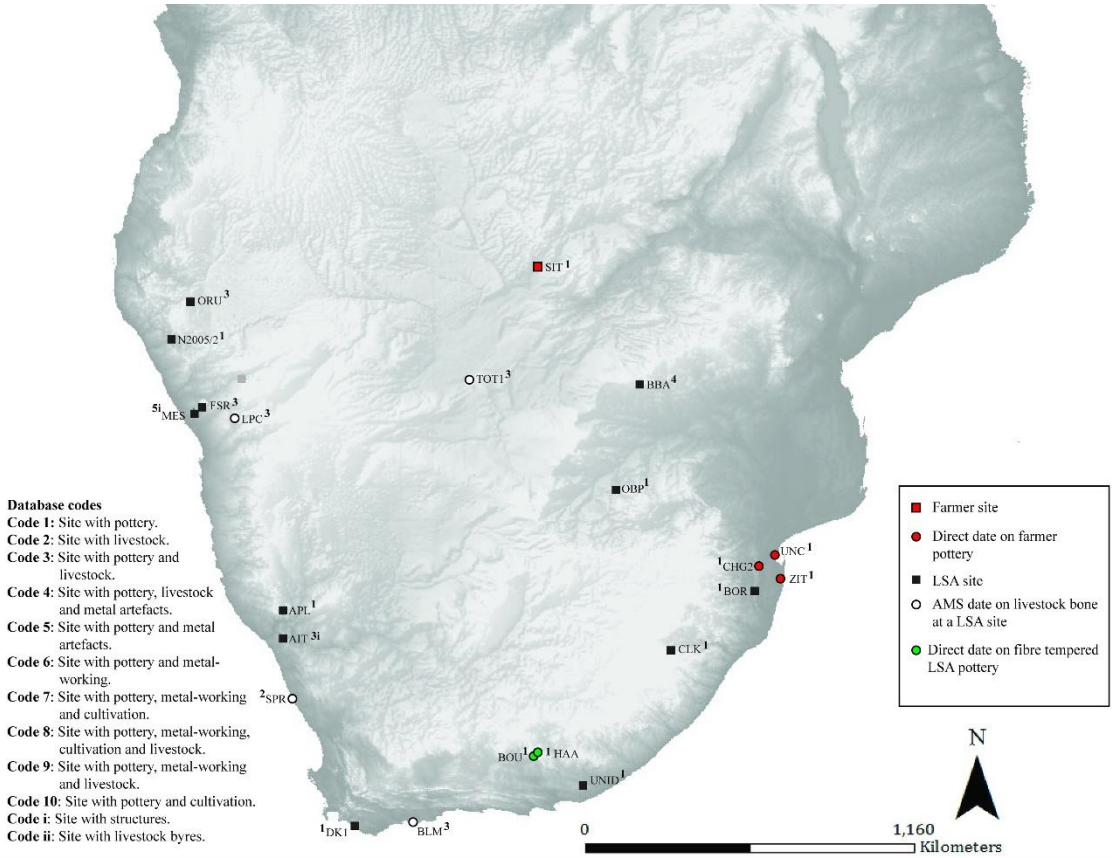
S1 Fig. Archaeological evidence for pastoralism and farming for the period 551–351 BC.



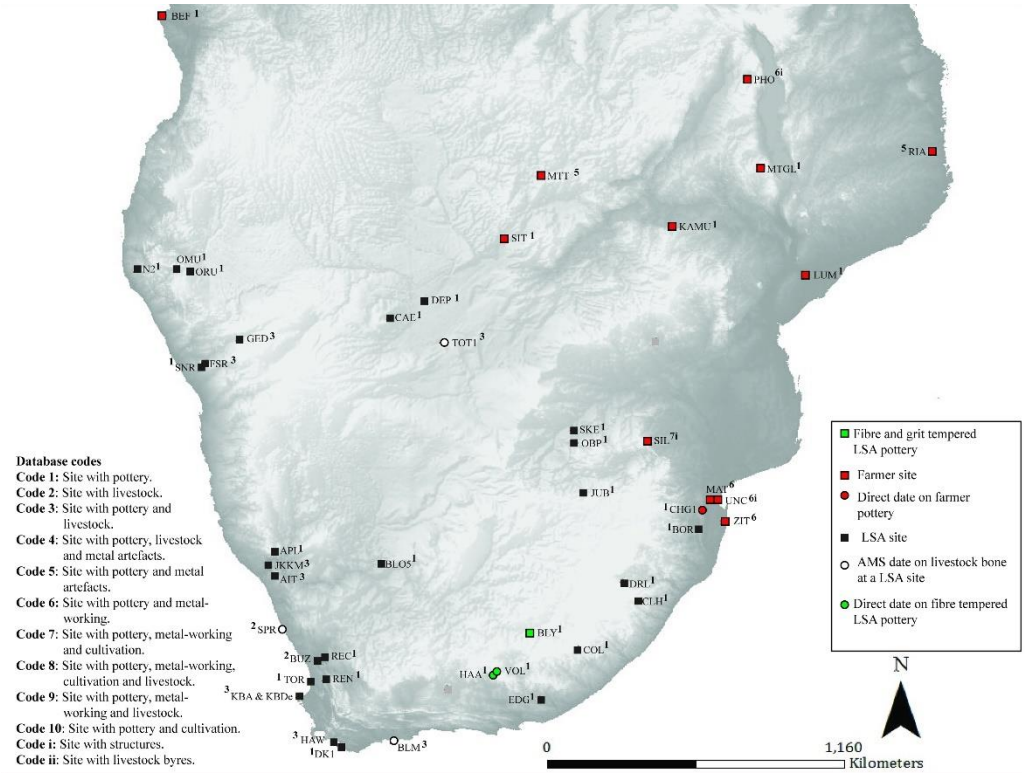
S2 Fig. Archaeological evidence for pastoralism and farming for the period 350–150 BC

Appendix 3

3.2 Supplementary Figures 1 -8 (S1-8 Fig.)



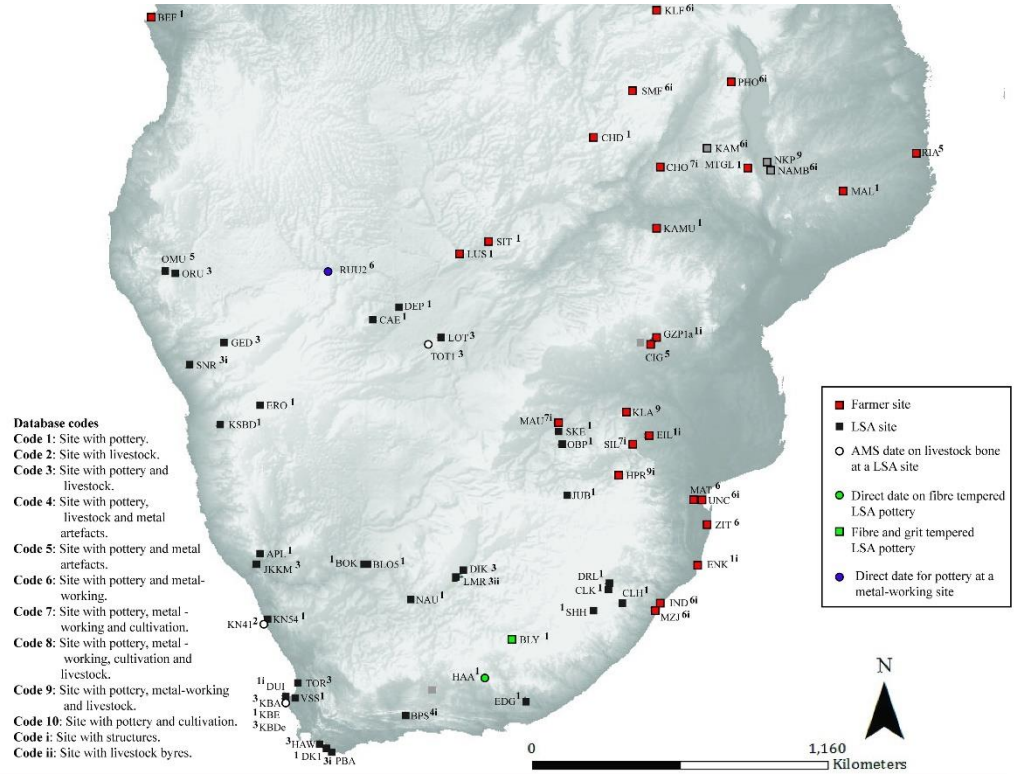
S3 Fig. Archaeological evidence for pastoralism and farming for the period 149 BC–AD 51.



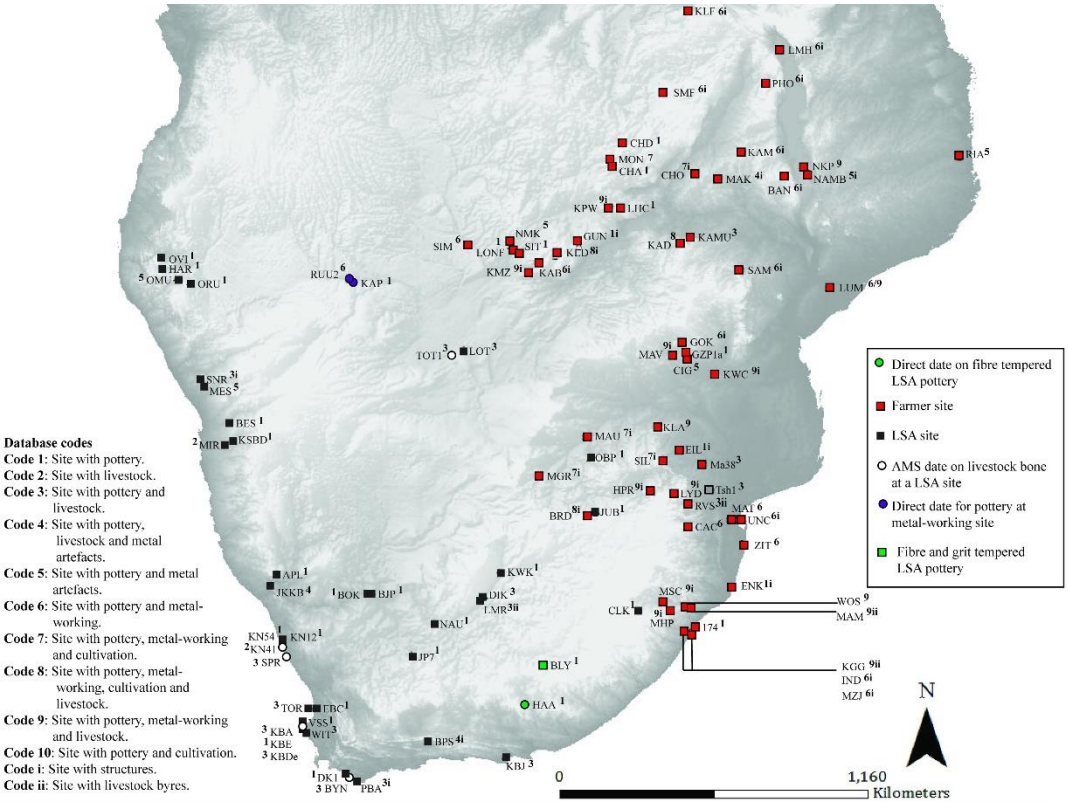
S4 Fig. Archaeological evidence for pastoralism and farming for the period AD 52–252.

Appendix 3

3.2 Supplementary Figures 1 -8 (S1-8 Fig.)



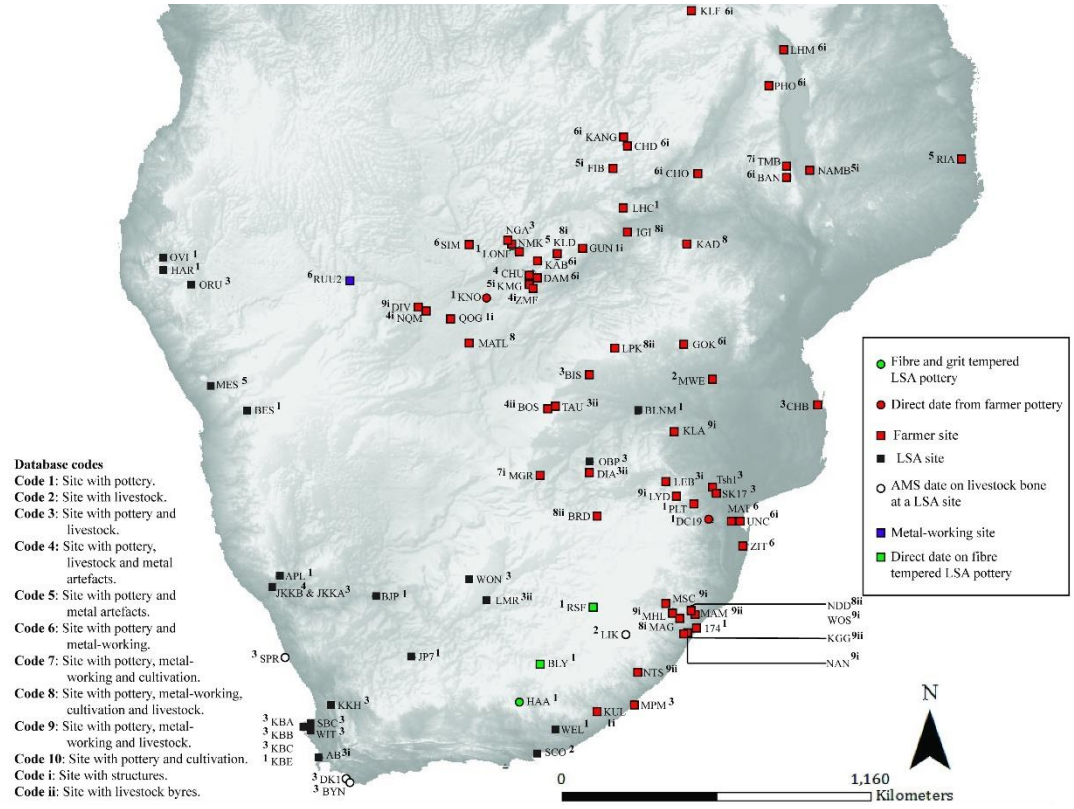
S5 Fig. Archaeological evidence for pastoralism and farming for the period AD 253–453.



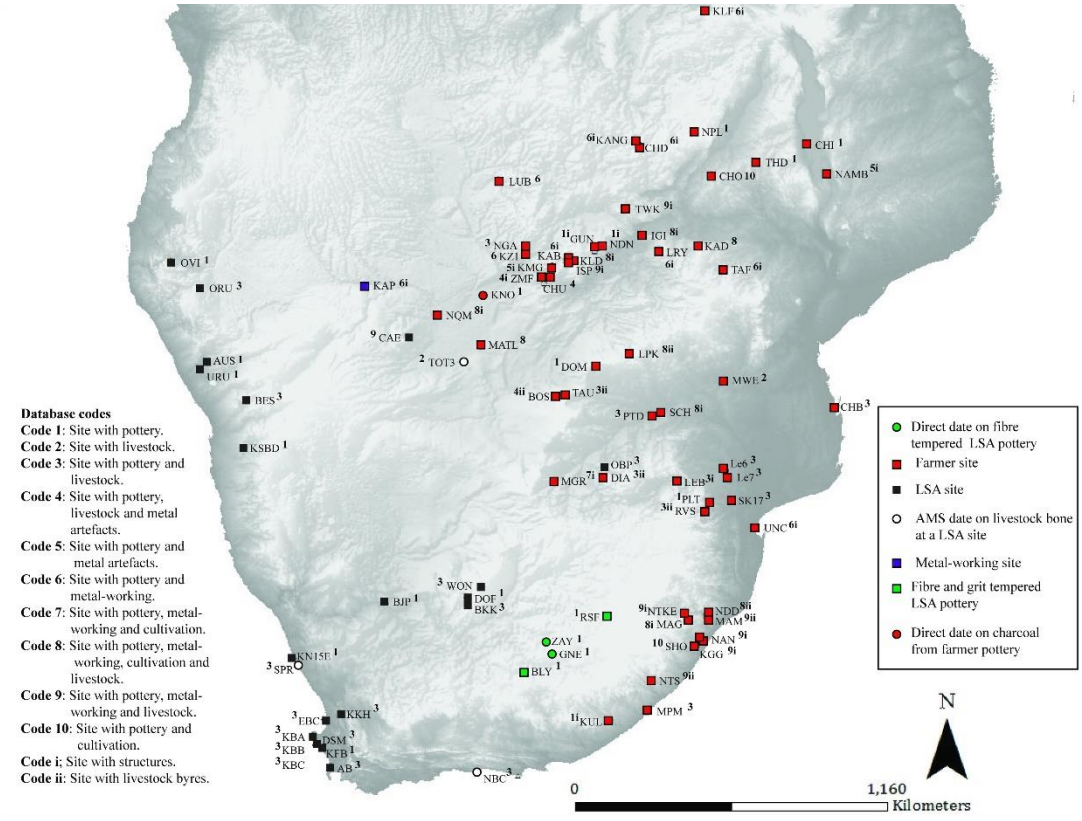
S6 Fig. Archaeological evidence for pastoralism and farming for the period AD 454–654.

Appendix 3

3.2 Supplementary Figures 1 -8 (S1-8 Fig.)



S7 Fig. Archaeological evidence for pastoralism and farming for the period AD 655–855.



S8 Fig. Archaeological evidence for pastoralism and farming for the period AD 856–1056.

Appendix 3

3.3.1. S1 Table. The archaeological evidence for the appearance of livestock, pottery, metal and crops in southern Africa (Database 1).

Site ID and country	Site Name Type of site References	Radiocarbon date Lab number	Calibration at 68.2% probability (BC or AD)	Median date	Grade of date 1 – 3	Temporal group 1 – 8	Database code 1 – 10 i-ii	List of archaeological traits
LPC Namibia	**Leopard Cave** Inland LSA rock shelter/herding [1]	2270±40 Beta-270164 **sheep AMS** 2190±40 Beta-270163 **sheep AMS**	370 – 211 BC 350 – 113 BC	-	1	1 – 3	3	• Undecorated pottery • Sheep
ZIT Mozambique	**Zitundo** Coastal hilltop site/farmer [2]	2200±50 **carbon dated pottery**	354 – 136 BC	-	1	1 – 3	1	• Matola 1 type pottery: fluted rims, single bands of horizontal line incisions with diagonal or cross-hatched incisions on shoulder and body, thickened rims 7-8mm, discontinuous motif on body.
UNC Mozambique	**University Campus** Open-air site/Farmer [2]	2190±60 **carbon dated pottery**	352 – 107 BC	-	1	1 – 3	1	• Matola 1 type pottery: fluted rims, single bands of horizontal line incisions with diagonal or cross-hatched incisions on shoulder and body, thickened rims 7-8mm, discontinuous motif on body.
CHG2 Mozambique	**Changalane II** Inland open-air site/farmer [2]	2170±50 **carbon dated pottery**	344 – 68 BC	-	1	2 – 3	1	• Matola 1 type pottery: fluted rims, single bands of horizontal line incisions with diagonal or cross-hatched incisions on shoulder and body, thickened rims 7-8mm, discontinuous motif on body. • Stone tools were found associated pottery at the site.
FAC Namibia	**Fackeltrager** LSA rock shelter [3]	2150±60 KN-I731 2190±40 KN-I732	337 – 328 BC 350 – 113 BC	-	1	2	1	• No description of pottery
BBA Zimbabwe	**Bambata Cave**	2140±60 Pta-3072	334 – 51 BC	-	3	2 - 3	4	• Bambata A pottery: 4-6mm thick; mostly jars; necked vessels and bowls, black to grey

Appendix 3

3.3.1. S1 Table. The archaeological evidence for the appearance of livestock, pottery, metal and crops in southern Africa (Database 1).

Site ID and country	Site Name Type of site References	Radiocarbon date Lab number	Calibration at 68.2% probability (BC or AD)	Median date	Grade of date 1 – 3	Temporal group 1 – 8	Database code 1 – 10 i-ii	List of archaeological traits
	Inland LSA cave site/pastoralist/hunter-gatherer [4, 5, 6]	(layer 3b)			The items occur above the date and are therefore not directly associated with the radiocarbon determination.			in colour, multiple bands of alternating designs, comb-stamping more common than incision, cross-hatching and punctates. Spouts were recovered at the site. • Cu bead • Sheep/goat (identification has not been confirmed).
BOU South Africa	**Boundary Shelter** Small inland overhang rock shelter/hunter-gatherer/hunter-herder [7, 8]	2160±50 Gr-A13564 **fibre from potsherd**	206 – 63 BC	-	1	2 – 3	1	• Pottery with mineral and grass inclusion.
CLK South Africa	**Clarke's Shelter** Inland LSA rock shelter/hunter-gatherer [9, 10, 11]	2160±50 Pta-2971	206 – 63 BC	-	3	2 – 3	1	• Early thin-walled ware: 7.78mm thick, bag-shaped, undecorated.
UNID	**Uniondale** Inland LSA rockshelter/hunter-gatherer [12]	2130±60 2125±55	Pta-1803 Pta-1804	-	3	2 - 3	1	• Early thin-walled ware: well baked, some decoration with shallow grooves, mostly globular shaped.
SPR South Africa	**Spoegrivier** Coastal LSA cave site/pastoralist [13, 14, 15]	2105±65 **Sheep AMS**	197 BC – AD 19	-	1	2 – 3	2	• 1 (M) sheep
SIT Zambia	**Situmpa** Inland open-air site/farmer	2110±50 Pta-2486 1930±100	196 BC – AD 15 38 BC – AD 240	-	3	2 – 5	1	• Situmpa ware (Channel Decorated Ware): thick-walled, generally bag-shaped with a

Appendix 3

3.3.1. S1 Table. The archaeological evidence for the appearance of livestock, pottery, metal and crops in southern Africa (Database 1).

Site ID and country	Site Name Type of site References	Radiocarbon date Lab number	Calibration at 68.2% probability (BC or AD)	Median date	Grade of date 1 – 3	Temporal group 1 – 8	Database code 1 – 10 i-ii	List of archaeological traits
	[16, 17]	1845±212 C-829	51 BC – AD 436					band of channel decoration below thickened rolled-over rim.
MES Namibia	**Messum 1** Inland LSA rock shelter [3, 18, 19]	2070±90 KN-I637 2090±45 KN-I639	195 BC – AD 67 134 BC – AD 18	-	3	2 – 3	5i	• No description of pottery • Fe loops (perhaps intrusive) • Pits
FSR Namibia	**Falls Rockshelter** Inland LSA rock shelter/Hunter-herder [20, 21]	2040±50 Pta-2930 2100±50 Pta-2929 1880±50 Pta-2927	145 BC – AD 18 57 BC – AD 52 AD 121 – 236	-	3	3 – 4	3	• Possible ripple ware, globular pots and bowls, undecorated and decorated with punctates or incisions. • 2 (M) sheep. • The date 1880±50 (Pta-2927) was taken from a dung layer at the site.
ORU Namibia	**Orunwanje 95/1** Inland LSA rock shelter [22, 23]	2208±46 KN-5005 2165±35 KN-5304 2140±40 KN-5298 2005±35 KN-5300	355 – 143 BC 204 – 74 BC 197 – 63 BC 46 BC – AD 73 *Terminus post quem* 1912±27	*Terminus post quem* 114 BC – AD 204 (noted by author)	3	3 – 4	3?	• Pottery 5mm thick, quartz and mica with ground potsherds, grey to red in colour with horizontal grooves and herringbone decoration. Rounded bases, some incised decorations. Handle or spout fragment and bowl fragment from the lower deposits. • Sheep remains were found in levels 16 (3101±37; UtC-5587, charcoal) and level 12 (undated but post 2208±46; KN5005 from level 13); goat (3101±37; UtC-5587; charcoal, level 16). The dating of livestock remains at the site is problematic.
N2005/2 Namibia	**N2005/2** Inland LSA rock shelter [24]	2090±35 KN-5798	110 BC – AD 17	-	3	3	1	• Thin-walled (4.96mm) pottery, quartz inclusion, parallel lines and/or horizontal grooves, dark brown in colour.

Appendix 3

3.3.1. S1 Table. The archaeological evidence for the appearance of livestock, pottery, metal and crops in southern Africa (Database 1).

Site ID and country	Site Name Type of site References	Radiocarbon date Lab number	Calibration at 68.2% probability (BC or AD)	Median date	Grade of date 1 – 3	Temporal group 1 – 8	Database code 1 – 10 i-ii	List of archaeological traits
TOT1 Botswana	**Toteng 1** Inland open-air site/hunter-herder/pastoralist [6, 25, 26, 27]	2070±40 Beta-1904888 **cow AMS** 2020±40 Beta-186669 **sheep AMS** 1990±60 Beta-44963	93 BC – AD 24 48 BC – AD 58 46 BC – AD 118	-	1 (2 AMS dates only related to livestock remains and not to pottery)	3 – 4	3	• Bambata A: "The dated Bambata sherd is more recent than the earliest AMS-dated livestock at Toteng1. This evidence (including 3 AMS-dated potsherds supported by 2 bulk charcoal dates, suggests that the livestock arrived in the area before the Bambata pottery. However, we remain cautious about this conclusion" [26: 139). • Sheep, cattle
AIT South Africa	**/Ai Tomas** Inland boulder site/pastoralist [13]	1980±120 Pta-5530	66 BC – AD 225	-	3	3 – 4	3i	• Cape coastal ware: lugs present, decoration occurs beneath the rims with impressed horizontal lines, roughened black exterior and interior, 5.4mm thick, gritty with mica inclusions. • 2 (M) sheep/goat • Pits
BOR South Africa/Swaziland	**Border Cave** Inland LSA rock shelter Hunter-gatherer [10, 28]	2010±50 Pta-506	49 BC – AD 72	-	3	3 – 4	1	• Early thin-walled ware.
HAA South Africa	**Haaskraal Shelter** Inland LSA Rock shelter/hunter- herder [7, 8]	1970±50 Gr-A13541 **fibre from potsherd**	48 BC – AD 326 37 BC – AD 127	-	1	3 – 5	1	• Pottery with mineral and grass inclusion.

Appendix 3

3.3.1. S1 Table. The archaeological evidence for the appearance of livestock, pottery, metal and crops in southern Africa (Database 1).

Site ID and country	Site Name Type of site References	Radiocarbon date Lab number	Calibration at 68.2% probability (BC or AD)	Median date	Grade of date 1 – 3	Temporal group 1 – 8	Database code 1 – 10 i-ii	List of archaeological traits
		1920±130 Gr-A13557 **fibre from potsherd**						
DK1 South Africa	**Die Kelders** Coastal LSA rock shelter/pastoralist [29]	1960±95 Gx-1687	46 BC – AD 206	-	3	3 – 4	1	• Thin-walled pottery, quartz inclusion, globular or bag shaped; undecorated, black with red-slip. • Sheep bone was recovered from level 7/9 associated with a radiocarbon determination (GX-2687), however AMS dates on sheep bone from level 7 indicate that the remains are younger.
GED Namibia	**Geduld** Inland LSA rockshelter/hunter-gatherer/pastoralist [30, 31]	1980±50 Pta-4413	41 BC – AD 121	-	3	3– 4	3?	• Ripple ware: thin-walled, spouts, undecorated and corrugated ware, burnishing is present (Bambata A). • Sheep/goat: Levels 7 and 8 produced sheep-size medium bovids but specific identification of sheep bones was possible only in Level 4. Level 4 remains undated [30:6]. • Upper grindstone
OBP South Africa	**Olieboomspoort** Inland LSA rock shelter hunter- gatherer [32]	2000±25 Pta-8030	40 BC – AD 71	-	3	3 – 4	1	• Bambata A pottery: thin-walled, jars, spout and bosses, grey to black with red slip, comb-stamped and incised, ripple rims. Happy Rest, Eiland, Broadhurst and Icon/Moloko pottery were found in the same

Appendix 3

3.3.1. S1 Table. The archaeological evidence for the appearance of livestock, pottery, metal and crops in southern Africa (Database 1).

Site ID and country	Site Name Type of site References	Radiocarbon date Lab number	Calibration at 68.2% probability (BC or AD)	Median date	Grade of date 1 – 3	Temporal group 1 – 8	Database code 1 – 10 i-ii	List of archaeological traits
								stratigraphic levels as Bambata A pottery at different frequencies.
BLM South Africa	**Blombos** LSA rockshelter/hunter-gatherer/hunter-herder [33, 34]	1960±50 OxA-4543 **sheep AMS** 1880±55 OxA-4544 **sheep AMS**	AD 23 – 198 AD 116 – 243	-	1	3 – 4	3	• Undecorated pottery with quartz inclusions. • 3 (M) sheep.
APL Namibia	**Apollo 11 Rockshelter** Inland LSA cave site/hunter-gatherer [18, 35, 36]	1960±45 Pta-1918	AD 25 – 195	-	2	3 – 4	1	• Early thin-walled ware.
CHG1 Mozambique	**Changlane I** Inland open-air site/farmer [2]	1930±50 **carbon dated pottery AMS**	AD 63 – 203	-	1 The pottery has been classified as Matola 2 ware which post-dates the AMS date.	4	1	• Matola 2 type pottery: bowls with everted rims. • Stone tools were found associated with pottery at the site.
OMU Namibia	**Omungunda 99/1** Inland LSA rock shelter/herding [23]	1940±22 KIA-16045 1842±25 KIA-11982	AD 70 – 125 AD 147 – 248	-	2	4	1	• Pottery 5mm thick, quartz and mica with ground potsherds, grey to red in colour, horizontal grooves and herringbone decoration and ‘Ripple’ Ware: quartz inclusion, thin-walled, 5.5mm thick.

Appendix 3

3.3.1. S1 Table. The archaeological evidence for the appearance of livestock, pottery, metal and crops in southern Africa (Database 1).

Site ID and country	Site Name Type of site References	Radiocarbon date Lab number	Calibration at 68.2% probability (BC or AD)	Median date	Grade of date 1 – 3	Temporal group 1 – 8	Database code 1 – 10 i-ii	List of archaeological traits
REN South Africa	**Renbaan** Inland LSA cave site [37]	1910±60 Pta-3783	AD 75 – 216	-	3	4	1	• Cape coastal ware: undecorated and black.
BUZ South Africa	**Buzz Shelter** Inland LSA rock shelter/hunter-gatherer [38]	1921±25 OxA-24515	AD 78 – 202	-	3	4	2	• 1 (M) sheep
DEP Botswana	**Depression Cave** Inland cave site/hunter-gatherer [39, 40]	1860±90 Beta-22878	AD 79 – 339	-	3	4 – 5	1	• Undecorated pottery. Pottery was associated with stone tools at the site.
VOL South Africa	**Volstruisfontein** Inland rock shelter/hunter/herder [7, 8, 41]	1890±50 Gr-A13560 **fibre from potsherd**	AD 116 – 232	-	1	4	1	• Pottery with mineral and grass inclusion.
HAW South Africa	**Hawston** coastal shell midden/strandlooper [42, 43]	1900±40 Pta-835 1860±60 Pta-834	AD 116 – 216 AD 120 – 322	-	3	4 – 5	3	• Pottery with lugs or boss, red in colour, undecorated, thin-walled, conical bases. • 1 (M) sheep
KBA South Africa	**Kasteelberg A** Coastal boulder site/hunter-herder/Pastoralist [44,45, 36, 46, 47, 48]	1860±60 Pta-3711 1790±40 Pta-3461	AD 120 – 322 AD 243 – 342	-	2	4 – 5	3	• Pottery 6mm thick, jar-shaped, spout, incised decoration and undecorated, red slip (Cape coastal pottery). • Sheep • Upper grindstones stained with ochre
COL South Africa	**Colwinton** Inland LSA rock shelter/hunter-gatherer [49, 10]	1890±45 Pta-2549	AD120 – 224	-	3	4	1	• Early-thin walled ware: 7mm wall-thickness, grit with some grass inclusions, undecorated, red to brown in colour.

Appendix 3

3.3.1. S1 Table. The archaeological evidence for the appearance of livestock, pottery, metal and crops in southern Africa (Database 1).

Site ID and country	Site Name Type of site References	Radiocarbon date Lab number	Calibration at 68.2% probability (BC or AD)	Median date	Grade of date 1 – 3	Temporal group 1 – 8	Database code 1 – 10 i-ii	List of archaeological traits
MAT Mozambique	**Matola IV** River terrace midden site/farmer [50, 51]	1880±50 R -1 327	AD 121 – 236	-	2	4	6	• Matola 1 type pottery: fluted rims, single bands of horizontal line incisions with diagonal or cross-hatched incisions on shoulder and body, thickened rims, between 7-8mm thick, discontinuous motif on body of pot. • Fe artefacts, Fe slag.
SKE South Africa	**Skeurkrans Shelter** Inland LSA rock shelter/hunter-gatherer [32, 52, 53]	1850±50 Pta-5161	AD 128 – 321	-	3	4 – 5	1	• Bambata A and Ripple ware.
ZIT Mozambique	**Zitundo** Coastal hilltop site/farmer [50]	1760±105 St-8911 1775±85 St-8909 1685±105 St-8912	AD 129 – 517 AD 247 – 362 AD 245 – 573	-	3	4 – 6	6	• Matola 1 type pottery: fluted rims, single bands of horizontal line incisions with diagonal or cross-hatched incisions on shoulder and body, thickened rims 7-8mm. discontinuous motif on body. • Fe slag
N2 Namibia	**N2000/2** LSA rock shelter [23]	1850±40 KIA-17709	AD 130 – 249	-	3	4	1	• Early thin-walled ware: 4mm, black to red sherds.
RIA Mozambique	**Rian Rockshelter** Inland rock shelter with farmer pottery [54]	1870±35 ICEN-133	AD 131 – 233	-	3	4	6	• Early farmer ware (no description except that it belongs to Kwale Tradition). • Fe artefact
PHO Malawi	**Phopo Hill** Open-air site/farmer [55, 56]	1745±170 SR-148	AD 133 – 530	-	2	4 – 6	6i	• Phopo ware: globular pots with everted rims and hemispherical bowls with in-turned rims, graphite burnish is present and channel decoration; black to grey in colour, 5 -10mm thick.

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3.3.1. S1 Table. The archaeological evidence for the appearance of livestock, pottery, metal and crops in southern Africa (Database 1).

Site ID and country	Site Name Type of site References	Radiocarbon date Lab number	Calibration at 68.2% probability (BC or AD)	Median date	Grade of date 1 – 3	Temporal group 1 – 8	Database code 1 – 10 i-ii	List of archaeological traits
								• Fe bangle, Fe slag, tuyere • Daga (no identifiable floor or feature) • Human figurine (not associated to radiocarbon date).
SNR Namibia	**Snake Rock** Inland LSA rock shelter/hunter-herder [57]	1840±50 Pta-2886	AD 134 – 330	-	3	4 – 5	1	• Ripple ware: globular pots and bowls; undecorated and decorated with punctates or incisions.
JUB South Africa	**Jubilee Shelter** Inland LSA rock shelter/hunter-gatherer [58, 15]	1840±50 Wits-1398	AD 134 – 330	-	2	4 – 5	1	• Bambata A: thin-walled (3.2-.9mm), 114 undecorated, 7 decorated with stamped impression, occasionally cross-hatching. • A single sheep bone occurs in the same layer as the earliest occurrence of Bambata A pottery but it is directly (AMS) dated to 310±50 (OxA-6039) (Sealy & Yates 1994).
EGH South Africa	**Edgehill** Inland LSA rock shelter/hunter-gatherer [59]	1830±60 Pta-3564	AD 136 - 339	-	3	4 – 5	1	• Albany ware: well-baked, thin-walled, globular-shaped pots with shallow grooved or impressed bands, red burnish occurs on some pots.
ORU Namibia	**Orunwanje 95/1** Inland LSA rock shelter/herding [22, 23]	1924±50 KN-4848 1950±35 KN-5303 1907±27 KN-5003 1900±40 KN-5302	AD 68 – 204 AD 49 – 195 AD 116 – 205 AD 116 – 216	AD 146	2	4	1	• Pottery 5mm thick; quartz and mica with ground potsherds; grey to red in colour with horizontal grooves and herringbone decoration. Rounded bases, some with incised decoration. Handle or spout fragment and bowl fragment from the lower deposits.
SPR South Africa	**Spoegrivier**	1900±50	AD 85 – 221	AD 163	1	4	2	• 3 (M) sheep

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3.3.1. S1 Table. The archaeological evidence for the appearance of livestock, pottery, metal and crops in southern Africa (Database 1).

Site ID and country	Site Name Type of site References	Radiocarbon date Lab number	Calibration at 68.2% probability (BC or AD)	Median date	Grade of date 1 – 3	Temporal group 1 – 8	Database code 1 – 10 i-ii	List of archaeological traits
	Coastal LSA cave site/pastoralist [13, 14, 15]	GrA-9032 **sheep AMS** 1900±50 GrA-9028 **sheep AMS** 1890±50 GrA-9092 **sheep AMS**	AD 85 – 221 AD 116 – 232					
LUM Mozambique	**Lumbi** Inland open-air site/farmer [60]	1900±30 UA-40071 1892±30 UA-40070	AD 121 – 205 AD 126 – 206	AD 165	2	4	1	• Matola type pottery: fluted rims, single bands of horizontal line incisions with diagonal or cross-hatched incisions on shoulder and body, thickened rims 7-8mm; discontinuous motif on body of pot. LSA stone tools are represented at this time period.
TOT1 Botswana	**Toteng 1** Inland open-air site/hunter-herder/pastoralist [25, 6, 26, 17]	1820±50 Pta-5534	AD 170 – 340	-	2	4 – 5	3	• Bambata A pottery: 4-6mm thick; mostly jars; necked vessels and bowls, black to grey in colour, multiple bands of alternating designs, comb-stamping more common than incision, cross-hatching and punctates are also present. • Sheep, cattle
MTT Zambia	**M'teteshi** Inland open-air site/farmer	2030±90 NZ-4520 1810±80	105 BC – AD 119 AD 144 – 364	AD 176	3	4	5	• Pottery with thickened rims, single band of chevron motifs and/or multiple lines.

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3.3.1. S1 Table. The archaeological evidence for the appearance of livestock, pottery, metal and crops in southern Africa (Database 1).

Site ID and country	Site Name Type of site References	Radiocarbon date Lab number	Calibration at 68.2% probability (BC or AD)	Median date	Grade of date 1 – 3	Temporal group 1 – 8	Database code 1 – 10 i-ii	List of archaeological traits
	[61]	NZ-4518						Punctates main decoration technique. Comb-stamping less frequent. • Fe bangle fragment, Fe razor, Fe spear point, Fe awl, Fe lump, Fe slag (few pieces) • Cow peas and sorghum sp. (not associated with radiocarbon dates) • Daga was recovered and was not associated with Unit P where the radiocarbon dates were derived.
REC South Africa	**Reception Shelter** Inland LSA small rock shelter [38]	1897±25 OxA-25353 1840±26 OxA-25354	AD 124 – 205 AD 145 – 249	AD 181	3	4	1	• Undecorated pottery
GED Namibia	**Geduld** Inland LSA rock shelter/Hunter-herder/pastoralist [30, 31]	1790±80 Pta-4419	AD 205 – 387	-	2/3 Sheep/goat remains found above this date.	4 – 5	3?	• Ripple ware: thin-walled, spouts, undecorated and corrugated ware, burnishing is present (Bambata A) • Sheep/goat • Upper grindstone
BLY South Africa	**Blydefontein** Inland large rockshelter/hunter–herder [62, 63,64, 65, 66, 67, 68]	1810±50 GrA-15192	AD 212 – 344	-	2	4 – 5	1	• (1) Fibre tempered pottery: described as grass tempered plain ware mostly shaped into bowls or bag-shaped pots. (2) undecorated thin-walled ware described as silt tempered, coil-built pottery with grass and silt temper. (3) Khoe pottery occurs in more recent layers.
BEF Angola	**Benfica** Coastal shell midden site/farmer	1810±50 Pta-212	AD 212 – 322	-	3	4 – 5	1	• Kalundu Tradition pottery: decorated with cross-hatching, stamping, herringbone, parallel lines and multiple bands; along with

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	[69, 70, 52, 6]							parallel lines on the neck; and alternating blocks of lines both in the neck and on the shoulder. LSA stone tools represented at the site
UNC Mozambique	**University Campus** Open-air site/farmer [71]	1775±85 St-9836	AD 214 – 410	-	2/3	4 – 5	6i	• Matola 1 pottery: fluted rims, single bands of horizontal line incisions with diagonal or cross-hatched incisions on shoulder and body, thickened rims, 7-8mm wall-thickness, discontinuous motif on body. • Fe artefacts, Fe slag • Pits associated with smelting debris, daga remains (no identifiable floor or feature).
TOR South Africa	**Tortoise Cave** Coastal LSA cave site/hunter-gatherer [72]	1800±60 Pta-5616 1780±50 Pta-5615	AD 217 – 361 AD 245 – 360	-	2	4 – 5	1	• Undecorated pottery; 5.5 – 12.5mm thick; black-brown to red in colour.
BLO5 South Africa	**Bloubos 5 BLO5** Inland LSA surface scatter [73, 74]	1810±45 Pta-7381 OES	AD 218 – 340	-	3 Date has not been corrected.	4 – 5	1	• Pottery with lugs; undecorated; red sherds; thin-walled (5.6mm), grit tempered.
MTGL Malawi	**Mitongwe/Liwadzi** Inland open-air site/farmer [75]	1730±90 SR-209	AD 236 – 464	-	3	4 – 5	1	• Nkope type pottery.
MAT Mozambique	**Matola IV** River terrace midden site/farmer [50, 51]	1720±110 St-8547	AD 242 – 518	-	2	4 – 6	6	• Matola 1 pottery: fluted rims, single bands of horizontal line incisions with diagonal or cross-hatched incisions on shoulder and

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								body, thickened rims, 7-8mm wall-thickness, discontinuous motif on body. • Fe artefacts, Fe slag
JKKM South Africa	**Jakkalsberg M** Inland open-air site/hunter-herder [38]	1740±75 GX-32760 OES	AD 246 – 417	-	3 Date has not been corrected.	4 – 5	3	• Pottery with horizontal incised decoration, 115 sherds have red slip, 3 lugs and 2 bosses present. • 1 (M) sheep, 2 (M) sheep/goat • Upper grindstone ochre stained, lower grindstone
CAE Botswana	**Cae Cae (Xai-Xai)** Inland open-air pan site/hunter-gather with farmer and herder items [76, 77]	1765±55	AD 247 – 372	-	3	0	5	• Early thin-walled ware: charcoal and calcrete temper with incised decoration [77]; Yellen and Brooks [78] note that the pottery is largely undiagnostic and thumbnail sized. • Fe bead (the bead is not directly associated with the radiocarbon date and has possibly been displaced in the deposit)
KAMU Zimbabwe	**Kamukombe** Inland open-air site/farmer [78]	1785±15 Pta-9642	AD248 – 338	-	2	4 – 5	1	• Kadzi ware: thick profiles, out-turned lips (decorated), rims with comb-stamping.
SIT Zambia	**Situmpa** Inland open-air site/farmer [16, 17]	1710±100 SR-40	AD 248 – 517	-	3	4 – 6	1	• Situmpa ware (Channel Decorated Ware): thick-walled, generally bag-shaped with a band of channel decoration below thickened, rolled-over rim.
KBDe South Africa	**Kasteeberg De** Coastal boulder site/hunter-herder [47, 48]	1760±50 Pta-8095	AD 249 – 370	-	3	4 – 5	3	• Pottery that has 6mm wall-thickness, jars, spout, incised decoration, less undecorated sherds, spouts and lugs present, red slip. • Total at site: 963 (N) sheep and sheep/goat, 57 (N) cattle (livestock occur in all levels at the site)

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3.3.1. S1 Table. The archaeological evidence for the appearance of livestock, pottery, metal and crops in southern Africa (Database 1).

Site ID and country	Site Name Type of site References	Radiocarbon date Lab number	Calibration at 68.2% probability (BC or AD)	Median date	Grade of date 1 – 3	Temporal group 1 – 8	Database code 1 – 10 i-ii	List of archaeological traits
DRL South Africa	**Driel Shelter** Inland LSA rock shelter/hunter-gatherer [10, 11, 79]	1775±40 Pta-1381	AD 249 – 356	-	2	4 – 5	1	• Early thin-walled ware: black to grey in colour, 8.21 mm thick, some are bag-shaped, undecorated.
SIL South Africa	**Silver Leaves** Inland open-air site/farmer [80, 81, 82]	1760±50 Pta-2360	AD 249 – 370	-	2	4 – 5	7i	• Silver Leaves: fluted bowls, beveled jars, single line punctates or incision on lip and rim, discontinuous motifs on body of pot. Pot with impressed bulrush millet* (pennisetum) • Fe artefact (unidentified), Fe slag, tuyere • Bulrush millet* • Pits, daga (no identifiable floor or feature)
ERO Namibia	**Eros** Inland LSA rock shelter/hunter-gatherer [35, 36]	1745±35 GrN-5297	AD 253 – 385	-	3	5	1	• Early thin-walled pottery
MAL Mozambique	**Malessane** Inland rock shelter with farmer pottery [54, 83]	1740±40 ICEN-132	AD 253 – 390	-	3	5	1	• Nkope pottery • Fe slag
SHH Lesotho	**Sehonghong** Inland LSA rock shelter/hunter-herder [84]	1710±50 Pta-6063	AD 254 – 425	-	2	5	1	• Early thin-walled pottery
ORU Namibia	**Orunwanje 95/1** LSA rockshelter/herding [22, 23]	1731±43 KN-4850 1731±43 KN-4850	AD 255 – 409	-	2	5	3	• Ripple rim ware(?) with coarse quartz inclusion, 5.7mm thick, incised lines, red to brown in colour. • Goat
DUI South Africa	**Duiker Eiland**	1700±50 Pta-1581	AD 255 – 439	-	3	5	1i?	• No description of pottery besides a spout present

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	Coastal shell midden site/herder [35, 85, 86]	Shell			Pottery and shell (both from the surface) were not associated in the layer and it could be that pottery post-dates shell.			• Stone features: Feature G from Duiker Eiland comprises a ring of stones (most likely a hearth feature) a date underlying the feature was given 1970±75 (Pta-1707). Another stone feature possibly a floor perhaps associated with a charcoal sample from a hearth in the centre (2280±45 (Pta-1709). The correlation between dates and stone features in the area however are not secure.
OMU Namibia	**Omungunda 99/1** Inland LSA rock shelter/herding [23]	1739±23 KIA-16046 1705±35 KN-5641	AD 257 – 385 AD 343 – 422	-	2	5	5	• Ripple ware, quartz inclusion, thin-walled (5.5mm), horizontal incisions, black to grey and red sherds. • Fe blade and awl.
OBP South Africa	**Olieboomspoort** Inland LSA rock shelter/hunter-gatherer [32]	1700±45 Pta-7798	AD 257 – 434	-	2/3	5	1	• Bambata A pottery: thin-walled; jars; spout and bosses, grey to black in colour with red slip, comb-stamped and incision, ripple rims. Happy Rest, Eiland, Broadhurst and Icon/Moloko pottery were found in the same stratigraphic levels as Bambata A pottery at different frequencies.
DIK1 South Africa	**Dikbosch 1** Inland LSA rock shelter/hunter-herder/ pastoralist [87]	1720±40 Pta-3413	AD 258 – 415	-	3	5	3?	• Doornfontein type pottery: grit tempered, relatively thin-walled (6-7mm), undecorated • Sheep/goat

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LMR1/2 South Africa	**Limerock 1&2** Inland LSA small rock shelter/hunter-herder/ pastoralist [87, 88]	1720±40 Pta-2095 (LMR2) 1620±50 Pta-1621 (LMR1)	AD 258 – 415 AD 422 – 536	-	3	5 – 6	3ii?	• Doornfontein type pottery: grit tempered, relatively thin-walled (6-7mm), undecorated and 'undulating effect' (ripple ware?). • 2 (M) sheep/goat • Sheep/goat enclosure (association to radiocarbon determination not clear), low stone walling (association to radiocarbon determination not clear)
CLH South Africa	**Collingham Shelter** Inland LSA rock shelter/hunter-gatherer [10, 11, 88]	1880±45 Pta-5101 1810±60 Pta-5262 1800±50 Pta-5096 1770±50 Pta-5274	AD 125 – 228 AD 205 – 360 AD 227 – 356 AD 248 – 362	AD 264	2	5	5	• Early thin-walled pottery: bag shaped; black to grey in colour, undecorated, thin-walled (5.88mm). • Fe bead, Cu bead
TOR South Africa	**Tortoise Cave** Coastal LSA cave site/hunter-gatherer. [72]	1680±50 Pta-3312 1620±50 Pta-3310 1610±50 Pta-3311	AD 361 – 517 AD 422 – 536 AD 425 - 541	-	2	5 – 6	3	• Undecorated pottery, 5.5 – 12.5mm thick; black-brown to red in colour. • Total at site: 13(M) sheep
LUS Zambia	**Lusu** Inland LSA site with farmer pottery [16, 17]	2025±230 C-830	After 355 BC – AD 317	-	3	5?	1	• Situmpa Ware or Channel Decorated Ware.
LOT Botswana	**Lotshitshi** Inland open-air site/hunter-herder	1660±100	AD 340 – 572	-	3	5 – 6	3	• Bambata A pottery: 4-6mm thick; mostly jars; necked vessels and bowls, black to grey in colour, multiple bands of alternating

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	[90, 91]							designs, comb-stamping more common than incision, cross-hatching and punctates. • Cattle
PHO Malawi	**Phopo Hill** Open-air site/Farmer [55, 56]	1655±95 SR-128	AD 344-572	-	2	5 – 6	6i	• Phopo ware: globular pots with everted rims and hemispherical bowls with in-turned rims, graphite burnish is present and channel decoration; black to grey in colour, 5 -10mm thick. • Fe bangle, Fe slag, tuyere • Daga (no identifiable floor or feature) • Human figurine (not associated to radiocarbon date).
SMF Zambia	**Samfya Forest** Inland open-air site/farmer [92]	1600±80 N-1935	AD 357 – 544	-	3	5 – 6	6i	• Kalambo type ware (Channel Decorated Ware). • Cu wire, Fe slag • Pits, post-hole impressed daga
SIL South Africa	**Silver Leaves** Inland open-air site/farmer [80, 81, 82]	1680±60 Pta-901	AD 359 – 520	-	2	5 – 6	7i	• Silver Leaves: fluted bowls, beveled jars, single line punctates or incision on lip and rim, discontinuous motifs on bod of poty. Pot with impressed bulrush millet (pennisetum) • Fe artefact (unidentified), Fe slag, tuyere • Bulrush millet • Pits, daga (no identifiable floor or feature)
PBA South Africa	**Pearly Beach Area** Coastal midden site/strandlooper [93]	1680±50	AD 361 – 517	-	3	5 – 6	3i	• Undescribed pottery • Sheep present (no faunal list provided) • Stone feature (circular probable hearth) • Upper grindstones

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NAU South Africa	**Nauga 1** Inland ochre mine site [94]	1680±50 Pta-4506	AD 361 – 517	-	3	5 – 6	1	• Doornfontein type pottery: grit tempered, relatively thin-walled (6-7mm), undecorated.
EIL South Africa	**Eiland Salt Works** Inland open-air salt working site/farmer [52, 95]	1680±40 Pta-1524	AD 363 – 471	-	2	5 – 6	1i	• Mzonjani pottery • Daga
KBE South Africa	**Kasteelberg E** Coastal boulder site/hunter-herder/pastoralist [48]	1670±60 Pta-7452	AD 368 – 520	-	3	5 – 6	1	• Pottery with 6mm wall-thickness, jar, spout, incised decoration; less undecorated sherds; red slip (Cape coastal pottery).
APL Namibia	**Apollo 11 Rockshelter** Inland LSA cave site/hunter-gatherer [35, 36]	1670±55 KN-1870	AD 369 – 519	-	2	5 – 6	1	• Early thin-walled pottery
CHO Zambia/Malawi Border	**Chowo River** Open-air river site/ farmer [96]	1670±40 Beta-182951 1600±40 Beta-182957	AD 373 – 516 AD 435 – 543	-	2	5 – 6	7i	• Chifumbaze Complex type pottery: simple stamped impressions in horizontal bands, thickened rounded rims. • Fe rusted clumps • Sorghum bicolor • Daga
MZJ South Africa	**Mzonjani** Coastal midden site/farmer [97]	1670±40 Pta-1980	AD 373 - 516	-	3	5 – 6	6i	• Mzonjani pottery: pots with straight or everted necks, single horizontal grooved decoration (impressions or incisions) below lip; discontinuous body decoration (‘wavy’, zig-zag, chevron designs), bowls: thick, sub-

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								carinated with horizontal grooved decoration below carination. • Fe slag, tuyere • Pit lined with potsherds
MAU Botswana	**Maunatlala** Inland open-air site/farmer [90]	1570±140	AD 381 – 651	-	2	5 – 6	7i	• Bambata B pottery • Metal use • Pole-impressed daga structures, grain-bins Carbonized cucurbits present at the site.
SNR Namibia	**Snake Rock** Inland LSA rock shelter/hunter-herders [21, 57]	1640±70 Wits-1249	AD 385 – 543	-	3	5 – 6	3i	• Ripple ware(?): globular pots and bowls; undecorated and decorated with punctates or incisions. • 1 (M) sheep • Stone-lined pits. Slivers of suspected sheep bone found (possibly used as decoration).
RUU2 Namibia	**Ruuga 2** Inland open-air site/Iron working groups [98, 99]	1602±123 KIA-28854 **charcoal extracted from pottery**	AD 385 – 630	-	2	5 – 6	6	• Pottery similar to Divuyu and Bambata • Fe working
DK1 South Africa	**Die Kelders** Coastal LSA rock shelter/pastoralist [29]	1600±120 GaK-3955 1590±80 Gak-3959 1480±55 UW-291	AD 387 – 630 AD 424 – 586 AD 576 – 656	-	3	5 – 6	1	• Thin-walled pottery: quartz inclusion, globular or ba- shaped, undecorated, black with red-slip. • 18 (M) sheep, 2 (M) cattle The dates provided here were obtained from the more recent layers at the site, however, directly dated sheep

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		1465±100 Gx-1685	AD 520 – 765					remains from an older layer (7) are dated earliest to 1325±60 (OxA-3860) and calibrated to AD 670 – 840 (Group 7). The relationship between these 4 radiocarbon determinations and the material is not secure.
KAM Zambia	**Kamnama** Inland open-air site/farmer [100]	1600±110 KN-908	AD 390 – 627	-	3	5 – 6	6i	• Kamnama type ware (only a few potsherds): grooved or stamped ware with some traces of burnishing. Mostly necked vessels. • Fe strip, Fe slag, tuyere • Daga (no identifiable floor or feature) • Lower grindstone
GZP1a Zimbabwe	**Great Zimbabwe P1a** Inland stone walling site [52]	1630±75 M913	AD 390 – 570	-	2	5– 6	1i	• Bambata B pottery: 6-10mm thick, multiple band decoration on neck and shoulder and Ziwa pottery present. • Daga
NKP Malawi	**Nkope Bay** Open-air site/farmer [56, 101, 102]	1590±120 SR-174	AD 392 – 636	-	3	5 – 6	9	• Nkope pottery: globular-shaped pot with a narrow thickened and everted rim. Decoration, apart from on the rim-band or a band of channeling immediately below it is rare but may occur on the shoulder. Angular motifs are usual, curvilinear designs are less common and when they do occur, they tend to be restrained in form. The bowls represent about 80 % of the total vessels at Nkope Bay (63 %), thickened and in-turned (33 %) and rounded. The two former types are usually decorated. This particularly applies to the in-turned rims, which are nearly always covered

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								with horizontal channeling or fluting, usually combined with impressed or incised decoration on or below the actual rim. In addition, molded bosses sometimes occur. • Fe smelting • 1 (M) cattle (single tooth) Hunting and fishing are the main activities at the site; LSA stone tools are present.
ENK South Africa	**Enkwazini** Coastal midden site/farmer [103]	1650±50 Pta-1847 1540±60 Pta-1977	AD 394 – 525 AD 520 – 641	-	2	5 – 6	1i	• Mzonjani pottery: pots with straight or everted necks, single horizontal grooved decoration (impressions or incision) below lip, discontinuous body decoration (‘wavy’, zig-zag, chevron designs), bowls: thick, sub-carinated with horizontal grooved decoration below carination • Pit
KBA South Africa	**Kasteelberg A** Coastal boulder site/hunter-herder/Pastoralist [36,44, 45, 46, 47, 48]	1630±60 OxA-3864 **sheep AMS**	AD 410 – 543	-	1	5 – 6	3	• Pottery with 6mm wall-thickness, jar, spout, incised decoration, less undecorated sherds, spouts and lugs present, red slip (Cape coastal pottery) • Sheep • Upper grindstones stained with ochre
RIA Mozambique	**Rian Rockshelter** Inland rock shelter with farmer pottery [54]	1485±170 ST-9021	AD 410 – 770	-	3	5 – 7	5	• Early farmer pottery (no description except that it belongs to Kwale Tradition). • Fe artefact
BPS South Africa	**Boomplaas**	Between 1700±55 UW-338	between AD 254 – 463	-	2	5 – 6	4i	• Undecorated and few decorated potsherds, spouts. • Cu bead

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	Inland LSA cave site/hunter-gatherer and herder [104, 105]	1630±50 UW-337 and 1510±75 UW-307	AD 417 – 531 and AD 521 – 655					• 12 (M) sheep • LSA storage pits, stone feature (hearth)
VSS South Africa	**Vonk se Stal** [48]	1630±60 Pta-4243	AD 410 – 543	-	3	5 – 6	1	• No description of pottery but one sherd with zig-zag double line decoration.
TOT1 Botswana	**Toteng 1** Inland open-air site/hunter-herder/pastoralist [6, 25, 26, 27]	1639±33 **charcoal from pottery** 1560±60 Beta-184609 1480±40 Beta-186670 **cow AMS**	AD 419 – 518 AD 474 – 628 AD 594 – 648	-	1	5 – 6	3	• Bambata A pottery: 4-6mm thick, mostly jars, necked vessels and bowls, black to grey in colour, multiple bands of alternating designs, comb-stamping more common than incision, cross-hatching and punctates are present. • Sheep, cattle
KLA South Africa	**Klein Afrika** Inland open-air site/farmer [52, 106]	1630±45 Pta-1168	AD 420 – 526	-	2	5 – 6	9	• Mzonjani pottery [52] or Gokomere and Happy Rest pottery types [106]. • Fe slag, tuyere, Fe ore • Cattle, goat • Pits, pole-impressed daga
OBP South Africa	**Olieboomspoort** Inland LSA rock shelter/hunter-gatherer [32]	1610±50 Pta-8027 1600±50 Pta-8032 1530±40 Pta-7799 1520±40 Pta-7778	AD 425 – 541 AD 431 – 586 AD 546 – 631 AD 550 – 636	AD 544	2/3	5 – 6	1	• Bambata A pottery: thin-walled, jars, spout and bosses, grey to black in colour with red slip, comb-stamped and incised, ripple rims. Happy Rest, Eiland, Broedhurst and Icon/Moloko pottery were found in the same stratigraphic levels as Bambata A pottery at different frequencies. • Sheep/goat are present but only in more recent occupation levels.

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3.3.1. S1 Table. The archaeological evidence for the appearance of livestock, pottery, metal and crops in southern Africa (Database 1).

Site ID and country	Site Name Type of site References	Radiocarbon date Lab number	Calibration at 68.2% probability (BC or AD)	Median date	Grade of date 1 – 3	Temporal group 1 – 8	Database code 1 – 10 i-ii	List of archaeological traits
UNC Mozambique	**University Campus** Open-air site site/farmer [71]	1590±75 St-9838	AD 427 – 583	-		5 – 6	6i	Total at site • Matola 1 pottery: fluted rims, single bands of horizontal line incisions with diagonal or cross-hatched incisions on shoulder and body, thickened rims, 7-8mm wall-thickness, discontinuous motif on body of pot. • Fe artefacts, Fe slag • Pits associated with smelting debris, daga remains (no identifiable floor or feature).
KSBD Namibia	**!Khuiseb Delta (Liz's Midden)** Shell midden site/hunter-herder/pastoralist [57, 107]	1600±50 Pta-4004	AD 431 – 568	-	3	5 - 6	1	• Pottery comprised small globular vessels, highly burnished and bearing in some cases elaborate decoration on the neck and rim.
KN41 South Africa	**KN2005/041** Coastal shell midden/hunter-herder [108]	1625±25 OxA-22933 **cow horn core AMS**	AD 431 – 519	-	1	5 – 6	2	• 1 (M) cattle
BOK South Africa	**Bokvasmaak 3** Inland open-air midden site/herder [74, 94, 109]	1620±35 Pta-4877 OES 120±50 (spit 2) Pta-4872	AD 431 – 525 AD 1700 – 1945	-	3 Date has not been corrected.	5 – 6	1	• Doornfontein type pottery: grit tempered, relatively thin-walled (6-7mm), undecorated. • 3 (N) sheep, 10 (N) cattle (associated with spit 2 radiocarbon date).

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3.3.1. S1 Table. The archaeological evidence for the appearance of livestock, pottery, metal and crops in southern Africa (Database 1).

Site ID and country	Site Name Type of site References	Radiocarbon date Lab number	Calibration at 68.2% probability (BC or AD)	Median date	Grade of date 1 – 3	Temporal group 1 – 8	Database code 1 – 10 i-ii	List of archaeological traits
NAMB Malawi	**Namaso Bay** Open-air site/farmer [110]	1555±110 GX-14812	AD 432 – 639	-	2	5 – 6	5i	• Nkope pottery • Fe corroded strip, Cu spirally wound wire • Post-hole daga • Upper grindstone, lower grindstone with oval groove mark
HPR South Africa	**Happy Rest** Inland open-air site/farmer [52, 111]	1600±45 Pta-2421	AD 433 – 545	-	3	5 – 6	9i	• Mzonjani pottery and/or Happy Rest pottery: everted or thickened rim pots with incised, stamped or grooved decoration on the rim and neck of vessel. • Fe slag Total livestock at site • 8 (M) sheep, 7 (M) cattle, 4 (M) goat, 8 (M) sheep/goat • Daga
KLF Zambia	**Kalambo Falls (Site C)** Inland open-air hill site/farmer [112, 113]	1605±40 GrN-4646 1520±40 GrN-4647	AD 434 – 539 AD 550 – 636	-	2	5 – 6	6i	• Kalambo pottery: channel decorated, mostly shouldered pots, hemispherical bowls, rounded rims common, channeled bands and incised cross-hatch also occur around the lip, rim and neck. Lugs, spouts and handles are not present in this ware. Two dimple bases were found from Site C. • Fe tanged or barbless spearhead or knife, Fe slag, tuyere • Pits (with bottomless pots), pole-impressed daga, hut floor • Upper grindstone, flat tabular lower grindstones

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3.3.1. S1 Table. The archaeological evidence for the appearance of livestock, pottery, metal and crops in southern Africa (Database 1).

Site ID and country	Site Name Type of site References	Radiocarbon date Lab number	Calibration at 68.2% probability (BC or AD)	Median date	Grade of date 1 – 3	Temporal group 1 – 8	Database code 1 – 10 i-ii	List of archaeological traits
OMU Namibia	**Omungunda 99/1** Inland LSA rock shelter/herding [23]	1602±29 KIA-22463 1600±35 KN-5285	AD 439 – 540 AD 439 – 542	-	2	5 – 6	5	• Ripple ware with quartz inclusion, thin-walled (5.5mm), horizontal incisions, black to grey and red sherds. • Fe blade and awl
TOR South Africa	**Tortoise Cave** Coastal LSA cave site/hunter-gatherer [73]	1590±50 Pta-5817 1580±50 Pta-3309	AD 440 – 575 AD 443 – 584	-	2	5 – 6	3	• Undecorated pottery; 5.5 – 12.5mm thick, black-brown to red in colour. Total livestock at site • 13 (M) sheep
KN54 South Africa	**KN2005/054** Coastal small shell midden [38]	1598±25 OxA-22932	AD 442 – 543	-	3	5 – 6	1	• Comb-stamped pottery, necked-pot, 7.08mm wall-thickness.
IND South Africa	**Inanda Quarry** Inland open-air site/farmer [114]	1580±50 Pta-5492	AD 443 – 584	-	3	5 – 6	6i	• Mzonjani pottery: pots with straight or everted necks, single horizontal grooved decoration (impressions or incision) below lip, discontinuous body decoration (‘wavy’, zig-zag, chevron designs), bowls: thick, sub-carinated with horizontal grooved decoration below carination. • Fe slag • Pit • Upper grindstone, lower grindstone with elliptical grooves
CLK South Africa	**Clarke’s Shelter** Inland LSA rock shelter/hunter-gatherer [9, 10, 11]	1580±50 Pta-2973	AD 443 – 587	-	2	5 – 6	1	• Early thin-walled pottery: 7.78mm thick, bag-shaped, undecorated.

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3.3.1. S1 Table. The archaeological evidence for the appearance of livestock, pottery, metal and crops in southern Africa (Database 1).

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CHD Zambia	**Chondwe** Open-air site/farmer [115]	1440±160 N-998	AD 443 – 841	-	3	5 – 7	1	• Chondwe group pottery: the lower levels yielded potsherds of Early Iron Age type characterized by thick fabric, gritty or sandy paste, and thickened or undifferentiated rims. The most frequent decorative motifs are lines of false-relief chevron-stamping and designs composed of segmental blocks of comb-stamping delineated by broad grooves. A limited number of incised designs also occur. Undecorated vessels are rare.
CIG Zimbabwe	**Cigwa Hilll** Inland open-air site/farmer [52]	1540±95 SR-119	AD 444 – 645	-	3	5 – 6	5	• Gokomere pottery • Fe artefacts
HAA South Africa	**Haaskraal Shelter** Inland rock shelter/hunter- herder [7, 41]	1570±50 Gr-A13541 **Fibre in pottery**	AD 468 – 595	-	1	6	1	• Pottery with mineral and grass inclusion
BJP South Africa	**Biesje Poort** Inland open-air site/herder [74, 94, 109]	1580±40 Pta-9569 1550±50 Pta-5578	AD 472 – 582 AD 520 – 634	-	2	6	1	• Pottery assemblage consisted of two spout fragments present, two decorated with incised lines and row of punctates. Burnished sherds are present, some grass tempering, relatively thin-walled (5.3mm).
SAM Zimbabwe	**Samakande** Open-air site/farmer [116]	1580±35 Ua-37563	AD 475 – 581	-	2	6	6i	• Ziwa pottery • Cu beads, Fe slag • Daga (burnt)

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3.3.1. S1 Table. The archaeological evidence for the appearance of livestock, pottery, metal and crops in southern Africa (Database 1).

Site ID and country	Site Name Type of site References	Radiocarbon date Lab number	Calibration at 68.2% probability (BC or AD)	Median date	Grade of date 1 – 3	Temporal group 1 – 8	Database code 1 – 10 i-ii	List of archaeological traits
								• Infant pot burial
DIK1&2 South Africa	**Dikbosch 1&2** Inland small LSA rock shelter/hunter-herder/pastoralist [87]	1570±40 Pta-3412	AD 478 – 592	-	3	6	3?	• Undecorated pottery • Sheep/goat
174 South Africa	**2931 CA174** Coastal midden site/farmer	1560±50 Pta-7577	AD 479 – 626	-	3	6 – 7	1	• Mzonjani pottery: pots with straight or everted necks, single horizontal grooved decoration (impressions or incision) below lip; discontinuous body decoration (‘wavy’, zig-zag, chevron designs), bowls: thick, sub-carinated with horizontal grooved decoration below carination.
GUN Zambia	**Gundu** Inland open-air site/farmer [52, 117]	1510±85 GX-1114	AD 480 – 658	-	3	6 – 7	1i	• Kamangoza type pottery showing affiliation to Kalundu, Dambwa and Kumadzulo ware and has origins with Naviundu pottery in the Congo • Pit (?), hut floor
KBJ South Africa	**Kabeljous** Coastal shell midden/pastoralist [118]	1560±40 Pta-5982	AD 481 – 601	-	3	6	3	• No description of pottery • Sheep
OMU Namibia	**Omungunda 99/1** Inland LSA rock shelter/herding [23]	1565±35 KN-5640 1530±30 KN-5642	AD 482 – 596 AD 548 – 629	-	2	6	5	• Ripple rim ware with coarse quartz inclusion, 5.7mm thick, incised lines, red to brown sherds with some grooved horizontal and diagonal lined pottery, channel ware, incised lines, occasional cross-hatching, oblique parallel lines, black to grey to brown, 6.3mm

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								wall-thickness, fine to medium sized quartz inclusions • Fe blade and awl
KN12 South Africa	**KN2004/012** Coastal LSA shell midden [38]	1579±24 OxA-22977	AD 483 – 580	-	3	6	1	• Two decorated pot sherds: thin-walled (4.79 mm), quartz inclusion, parallel lines or horizontal diagonal incised lines, two rows of vertical impressions.
EBC South Africa	**Elands Bay Cave** Coastal LSA cave site/hunter-gatherer [119, 120, 121]	1520±80 Gak-4337	AD 497 – 652	-	2	6	1	• Lower KBB and KBA style pottery including beveled lips, shell edge-stamped decorations and spouts.
SMF Zambia	**Samfya Forest** Inland open-air site/farmer [92]	1520±80 N-1934	AD 497 – 652	-	3	6	6i	• Kalambo type ware (Channel Decorated Ware) • Cu wire, Fe slag • Pits, post-hole impressed daga (?)
MAV Zimbabwe	**Mabveni** Inland old Kraal site/farmer [52, 122, 123, 124]	1770±120 SR-43 1380±110 SR-79	AD 130 – 429 AD 599 – 857	AD 504	3	6	9i	• Bambata B pottery: 6-10mm thick, multiple band decoration on neck and shoulder and Gokomere type pottery [52] or only Gokomere type pottery [121]. • Fe beads, Cu beads and rings, Fe slag • Cattle, sheep/goat • Pits, pole-impressed daga, daga floor (irregular in shape but thought to be circular), raised storage bin (uncertain) • Clay human figurine
KBDe South Africa	**Kasteelberg De**	1550±50 Pta-8004	AD 520 – 634	-	3	6	3	• Pottery with 6mm wall-thickness, jars, incised decoration, less undecorated sherds,

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	Coastal boulder site/hunter-herder/ Pastoralist [46]							spouts and lugs present, red slip and shell-stamped pottery (Cape coastal pottery). Total livestock at site: • 963 (N) sheep and sheep/goat, 57 (N) cattle (livestock occur in all levels at the site)
MIR Namibia	**Mirabib Hill** Inland LSA rock shelter site [125]	1550±50 Pta-1535	AD 520 – 634	-	3	6	2	• Sheep hair from dung floor • 10-20 cm dung floors
PHO Malawi	**Phopo Hill** Open-air site/farmer [55, 56]	1445±120 SR-161	AD 520 – 771	-	2	6 – 7	6i	• Phopo ware: globular pots with everted rims and hemispherical bowls with in-turned rims, graphite burnish is present and channel decoration, black to grey in colour, 5 -10mm thick. • Fe bangle, Fe slag, tuyere, daga (no identifiable floor or feature) • Human figurine (not associated to radiocarbon date).
KLD Zambia	**Kalundo Mound** Inland open-air mound site/farmer [17]	1650±90 SR-65 1495±95 SR-123	AD 361 – 572 AD 480 – 676	AD 523	2	6	8i?	• Kalundu Tradition pottery: multiple band decoration on neck, shouldered vessels, thin-walled, globular shaped pots, bowls: thick-walled, spouts, lugs and bosses are present (but not numerous), burnishing present (mostly graphite around necked pots and bowls), comb-stamping common feature of decoration, increase in bag-shaped pots with increase in livestock at site. • Fe strip, Cu bracelet, Fe slag (small amount), tuyere (1 piece), bellow nozzles

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								Total livestock at site: • 3(N) cattle, sheep/goat (number not provided) • Pits, daga (no identifiable floor), grain-bin (?) • Human burials with no grave goods • Clay humped cattle figurines
NAMB Malawi	**Namaso Bay** Open-air site/farmer [110]	1300±260 GX-14811	AD 524 – 1039	-	2	6 - 8	5i	• Namaso pottery: sub-spherical bowls with slightly constricted mouths, open hemispherical bowls, both highly decorated with single line-impressions or comb-stamped near rim or towards shoulder in a mostly crisscross (stich) motif. • Fe corroded strip, Cu spirally wound wire • Post-hole daga • Upper grindstone, lower grindstone with oval groove mark
JUB South Africa	**Jubilee Shelter** Inland LSA rock shelter/hunter-gatherer [58]	1550±40 Wits-1381	AD 525 – 629	-	2	6	1	• Bambata A pottery: thin-walled (3.2-.9mm), 114 undecorated, 7 decorated with stamped-impression, occasionally cross-hatching.
LUM Mozambique	**Lumbi** Open-air site/farmer [60]	1558±30 Ua-40067	AD 526 – 596	-	2	6	9	• Matola type pottery: fluted rims, single bands of horizontal line incisions with diagonal or cross-hatched incisions on shoulder and body, thickened rims 7-8mm, discontinuous motif on body of pot. • Fe arrowheads, Fe knives, Fe bangle, Fe slag, • 1 (N) cow (identification is not secure), 5 (N) sheep/goat (identification is not secure)

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LMR1&2 South Africa	**Limerock 1&2** Inland LSA small rock shelter/hunter-herder/pastoralist [87, 88]	1620±50 Pta-1621 1430±50 Pta-1759	AD 422 – 536 AD 600 – 680	-	3	6 – 7	3ii	• Doornfontein type pottery: grit tempered, relatively thin-walled (6-7mm), undecorated with 'undulating effect' (Ripple ware?). • 2 (M) sheep/goat, • Sheep/goat enclosure (association to radiocarbon determination is unknown), low stone walling (association to radiocarbon determination is unknown).
SIM Zambia	**Sioma Mission** Inland open-air site/farmer [126]	1498±75 N-1498	AD 530 – 660	-	3	6 – 7	6	• Early farmer pottery • Fe working, Fe smelting
KLA South Africa	**Klein Afrika** Inland open-air site/farmer [52, 106, 127]	1540±50 Pta-2415 1450±45 Pta-1321 1430±40 Pta-1320 1410±50 Pta-2420	AD 530 – 635 AD 601 – 665 AD 630 – 678 AD 631 – 763	-	2	6 – 7	9i	• Happy Rest pottery • Fe slag, tuyere, Fe ore Total livestock at site: • 24 (N) cattle, 93 (N) sheep/goat • Pole-impressed daga (no structure identified)
KAP Namibia	**Kapako** Inland surface site/Iron working groups [99]	1550±30 POZ-20679 **charcoal extracted from pottery**	AD 531 – 600	-	3	6	1	• No description of pottery
CHA Zambia	**Chalaka** Inland open-air site (Pit)/farmer	1520±65 N-4995	AD 532 - 646	-	3	6	1	• Pottery is similar to the site, M'teteshi.

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	[61]							
RUU2 Namibia	**Ruuga 2** Inland open-air site/Iron working groups [99]	1565±20 KIA-28853 **charcoal extracted from pottery**	AD 534 – 580	-	2	6	6	• Pottery similar to Divuyu and Bambata • Fe working
LON Zambia	**Lonze Forest** Inland open-air site/farmer [16, 128]	1481±82 C-660	AD 535 – 676	-	3	6 – 7	1	• Situmpa ware (Channel Decorated Ware)
RVS South Africa	**Riverside** Inland open-air site/farmer [52, 129]	1540±40 Pta-7591	AD 536 – 630	-	2	6	3ii	• Mzonjani/Broederstroom pottery • Cattle • Pits dung lined (storage), livestock byre
KAMU Zimbabwe	**Kamukombe** Inland open-air site/farmer [78]	1520±60 Pta-9638	AD 537 – 644	-	2	6	3	• Kadzi pottery: thick profiles, out-turned lips (decorated), rims with comb-stamping. • Sheep/goat (no count provided)
MAT Mozambique	**Matola IV** River terrace midden site/farmer [50, 51]	1470±80 St-8546	AD 539 – 678	-	2	6 – 7	6	• Matola type pottery: fluted rims, single bands of horizontal line incisions with diagonal or cross-hatched incisions on shoulder and body, thickened rims, 7-8mm wall-thickness, discontinuous motif on body of pot. • Fe artefacts, Fe slag
GOK Zimbabwe	**Gokomere Tunnel Site** Inland rock shelter site/farmer	1420±120 SR-26	AD 540 – 836	-	3	6 – 7	6i	• Gokomere pottery: typically, stamped ware • Fe artefacts, Cu strip, Fe slag • Pole-impressed daga

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	[122, 130, 52]							• Human burial (spouted bowl found with burial) • Clay female human figurines Wilton Type tools found in earlier excavation.
LHC Zambia	**Leopards Hill Cave** Inland LSA Cave site with farmer pottery [131]	1415±125 SR-126	AD 541 – 842	-	3	6 – 7	1	• Channel Decorated Ware
KMZ Zambia	**Kumadzulo** Inland open-air site/ farmer [132]	1529±110 N-409 1400±110 N-411 1390±110 N-410 1330±110 N-412 1260±110 N-414	AD 439 – 650 AD 579 – 841 AD 589 – 843 AD 654 – 862 AD 682 – 957	AD 545	2	6	9i	• Kumadzulo pottery with similarities to Gundu and Ndonde sites • Fe spearheads and arrowheads, one small Fe hoe, Cu 'crosses', Fe slag Total livestock at site: • 2 (M) cattle • Pits, pole-impressed daga, hut floors (sub-rectangular) • Clay figurine
ZIT Mozambique	**Zitundo** Coastal hilltop site/farmer [2, 50]	1435±105 St-8910 1490±50 **Pottery AMS**	AD 547 – 767 AD 576 – 650	-	2	6 – 7	6	• Matola 2 phase pottery: larger range of decoration than Matola 1, alternating bands of incision and cross-hatching (similar to Mzonjani and Lydenburg Heads sites). • Fe slag
KWC Zimbabwe	**Kwali Camp** Inland open-air Fe smelting site/farmer [133]	1490±60 Beta-200558	AD 548 – 653	-	2	6	9i	• Ziwa and Gokomere pottery • Fe blade, Fe slag, tuyere, Fe ore, furnace clay • 3 (M) sheep, 8 (M) cattle

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OVI Namibia	**Ovizorombuku 96/1** Inland LSA rock shelter [23]	1525±35 KN-5295 1442±25 KIA-11985	AD 549 – 633 AD 634 – 664	-	3	6 – 7	1	• Pottery with 5.5mm wall-thickness, quartz grit, well fired, some burnished sherds (ochre and black), incised horizontal and/or oblique lines, some cross-hatching and one sherd with herringbone-like motif and another with possible finger-nail impressions.
BLY South Africa	**Blydefontein** Inland large rock shelter/hunter- herder [62, 63, 64, 65, 66, 67, 68]	1505±50 GrA-15195	AD 552 – 645	-	1	6	1	• (1) Fibre tempered pottery: described as grass tempered plain ware mostly shaped into bowls or bag-shaped pots and undecorated. (2) Undecorated thin-walled ware described as silt tempered, coil-built pottery with grass and silt temper. (3) Khoe pottery occurs in more recent layers.
DK1 South Africa	**Die Kelders** Coastal LSA rock shelter/pastoralist [29]	1480±55 UW-291	AD 576 – 656	-	2	6 – 7	3	• Thin-walled pottery with quartz inclusion, globular or bag-shaped- undecorated, black with red-slip. • 1 (M) sheep
SPR South Africa	**Spoegrivier** Coastal LSA cave site/pastoralist [13, 14, 15]	1490±50 GrA-9030 **sheep AMS** 1450±50 Pta-6750 1390±50 Pta-4753	AD 576 – 650 AD 599 – 668 AD 643 – 765	-	1	6 – 7	3	• Thin-walled pottery with quartz inclusion, some horizontal grooved sherds and undecorated sherds. • 12 (M) sheep
KAB Zambia	**Kabondo Kumbo** Open-air river site/farmer [134]	1430±80 N-1918	AD 579 – 765	-	3	6 – 7	6i	• Kamangoza**,** Dambwa and Kumadzulo type ware. • Fe hoes, Fe arrowheads, Fe spearheads, small Fe axe, Fe knives, Fe bodkins, Fe razors, Fe bracelet, Cu bangles, Fe slag, tuyere

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								• Pits, pole-impressed daga, hut floor (sub-rectangular in shape) • Clay cattle figurine (?)
BRD South Africa	**Broederstoom** Inland open-air site/farmer [135, 136, 137,129, 52]	1600±50 KN-2645 1520±110 RL-351 1570±65 KN-2644 1450±100 Fra-82 1540±40 Pta-1375 1530±50 Wits-871 1490±50 UCLA-1791B 1440±50 Wits-870	AD 431 – 568 AD 439 – 654 AD 441 – 596 AD 536 – 765 AD 536-630 AD 540 – 635 AD 576 – 650 AD 601 – 676	AD 580	2	6	8i	• Mzonjani/Broederstroom pottery (reclassified from a Kalundu (western stream) origin. • Fe artefacts, Cu beads and chain links, Fe slag, tuyere, Fe working (forges), Fe ore Total livestock at site: • 1 (M) cow, 42 (M) sheep/goat • Pits dung-lined, post-hole impressed daga, hut floors (but no complete residential unit found), grain-bins • Human burial with grave goods, human burial with dental alteration, infant pot burial • Upper grindstones, lower grindstones with lenticular grooves
HPR South Africa	**Happy Rest** Inland open-air site/farmer [52, 111]	1480±50 Pta-2414	AD 583 – 652	-	3	6	9i	• Happy Rest pottery: everted or thickened rim pots with incised, stamped or grooved decoration on the rim and neck of vessel • Fe slag Total livestock at site: • 8 (M) sheep, 7 (M) cattle, 4 (M) goat, 8 (M) sheep/goat

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Site ID and country	Site Name Type of site References	Radiocarbon date Lab number	Calibration at 68.2% probability (BC or AD)	Median date	Grade of date 1 – 3	Temporal group 1 – 8	Database code 1 – 10 i-ii	List of archaeological traits
								• Daga • Human burial with grave goods (ivory bracelet) A diet based mainly on herded animals.
Ma38 South Africa	**Ma38** Inland open-air site/farmer [138, 139, 52]	1480±50 Pta-3725	AD 583 – 652	-	3	6	3	• Mzonjani/Broederstroom ceramic: pots with straight or everted necks, single horizontal grooved decoration (impressions or incision) below lip, discontinuous body decoration ('wavy', zig-zag, chevron designs), bowls: thick, sub-carinated with horizontal grooved decoration below carination. • 1 (M) sheep/goat
KPW Zambia	**Kapwirimbwe** Inland open-air site/farmer [140, 141]	1525±110 GX1013a 1540±85 GX1013b 1445±95 GX-1912	AD 439 – 652 AD 475 – 643 AD 541 – 765	AD 586	2	6	9i	• Early farmer pottery: classified as Kapwirimbwe ware with necked vessels and hemispherical bowls forming the majority of the assemblage. Decorated with horizontal bands of incised hatchings or bands of chevron designs. Rims are thickened. • Fe razor, Fe spear point and ring, large quantities of Fe slag • 2 (N) cattle • Pits, daga, post-hole impressed daga (structures could not be determined).
KSBD Namibia	**!Khuiseb Delta (End Midden)** Shell midden site/Hunter-herder/pastoralist [57]	1470±45 Pta-4049	AD 587 – 650	-	3	6	1	• The pottery comprised small globular vessels, highly burnished and bearing in some cases elaborate decoration on the neck and rim.

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3.3.1. S1 Table. The archaeological evidence for the appearance of livestock, pottery, metal and crops in southern Africa (Database 1).

Site ID and country	Site Name Type of site References	Radiocarbon date Lab number	Calibration at 68.2% probability (BC or AD)	Median date	Grade of date 1 – 3	Temporal group 1 – 8	Database code 1 – 10 i-ii	List of archaeological traits
KWK South Africa	**Klein Witkrans** Inland small LSA rock shelter [87, 88]	1490±40 Pta-2447	AD 589 – 645	-	3	6	1	• Undecorated pottery, black in colour, grit-tempered.
APL Namibia	**Apollo 11 Rockshelter** Inland LSA cave site/hunter-gatherer [18 35, 36]	1460±55 KN-1846	AD 590 – 666	-	2	6 – 7	1	• Early thin-walled pottery
CAC Swaziland	**Castle Cavern** Inland Iron ore mining site [142, 143, 144, 145]	1550±60 Y-1712 1550±30 GRN-5315 1535±30 GRN-5022 1430±100 Y-1995	AD 482 – 635 AD 531 - 600 AD 545 – 626 AD 536 – 765	AD 591	2	6	6	• Silver Leaves: fluted bowls, beveled jars, single line punctates or incision on lip and rim, discontinuous motifs on body of pot. • Fe smelting debris. • A few tools of LSA type [143].
LYD South Africa	**Lydenburg Head site** Inland open-air site/farmer [97, 146, 147, 148]	1460±50 Pta-328 1410±50 Pta-1634	AD 592 – 662 AD 631 – 763	-	3	6 – 7	9i	• Kalundu [146] or Matola [97, 148] type pottery • Fe beads, Fe rods, Cu beads, Fe slag, tuyere • 2 (M) sheep, 4 (M) cattle, 10 (M) sheep/goat • Dung lined pits, pole-impressed daga (no structure identified) • Human burial with dental alteration • Clay sculptured heads (therianthropic)

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3.3.1. S1 Table. The archaeological evidence for the appearance of livestock, pottery, metal and crops in southern Africa (Database 1).

Site ID and country	Site Name Type of site References	Radiocarbon date Lab number	Calibration at 68.2% probability (BC or AD)	Median date	Grade of date 1 – 3	Temporal group 1 – 8	Database code 1 – 10 i-ii	List of archaeological traits
CHO Zambia/Malawi Border	**Chowo River** Open-air river site/farmer [96]	1480±40 Beta-182957	AD 594 – 648	-	2	6	7i	• Chifumbaze Complex type pottery: simple stamped impressions in horizontal bands, thickened rounded rims. • Fe rusted clumps • Sorghum bicolor • Daga
LMH Malawi	**Lumbule Hill** Open-air site/farmer [55, 56]	1385±100 SR-147	AD 597 – 839	-	3	6 – 7	6i	• Mwavarambo type ware • Fe artefacts, Fe smelting • Daga (structures not identified)
KBA South Africa	**Kasteelberg A** Coastal boulder site/hunter-herder /Pastoralist [36, 44, 45, 46, 47, 48]	1430±55 OxA-3865 **sheep AMS**	AD 598 – 681	-	1	6	3	• Pottery with 6mm wall-thickness, jars, spout, incised decoration; less undecorated sherds; spouts and some lugs present, red slip, and some shell-stamped pottery (Cape coastal pottery) Total livestock at site: • 29 (M) sheep, 2 (M) cattle (mostly in the upper levels).
EIL South Africa	**Eiland Salt Works** Inland open-air salt working site/farmer [52, 95]	1460±40 Wits 764	AD 599 – 654	-	2	6	1i	• Mzonjani pottery • Daga
JP7 South Africa	**Jagt Pan 7** Inland open-air stone feature site/hunter-herder [74, 94, 109]	1430±50 Pta-4300	AD 600 – 680	-	3	6 – 7	1	• Undecorated pottery, black in colour, thin-walled (4mm).
HAR Namibia	**Hartmann Valley 95/4**	1480±30 KN-5287 1407±50	AD 600 – 645 AD 632 – 764	-	2	6 – 7	1	• Single sherd with incised lines, other sherds show cross-hatching, black to grey to brown in colour, 5.75mm wall-thickness, fine to

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	Inland small LSA rock shelter [23]	KN-4851						medium sized quartz inclusions. Most sherds recovered are undecorated.
Tsh1 South Africa	**Tsh1** Inland open-air site/farmer [52, 139]	1440±50 Pta-3825	AD 601 – 676		3	6 – 7	3	• Mzonjani/Broederstroom pottery (reclassified from a Kalundu origin) • 29 (M) sheep/goat
BES Namibia	**Big Elephant Shelter** Inland LSA rock shelter/hunter-gatherer [149, 150]	1400 ±80 UCLA-724B	AD 605 - 768	-	3	6 - 7	1	• Pottery with vertical row of impressions and horizontal nail impressions, 6 -7 mm thick, mostly undecorated, greyish in colour. Spout present.
ORU Namibia	**Orunwanje 95/1** Inland LSA rock shelter/herding [22, 23]	1520±32 KN-5297 1511±33 KN-5938 1419±40 KN-5302	AD 573 – 635 AD 580 – 637 AD 634 – 681	AD 624	2	6	1	• Ripple rim ware with coarse quartz inclusion, 5.7mm thick, incised lines, red to brown sherds.
MAK Zambia	**Makwe** Inland LSA rock shelter with farmer pottery [100, 151]	1730±110 GX-1551 1200±80 SR-107	AD 229 – 517 AD 772 – 983	AD 625	3	6	4i	• Kamnama type pottery: necked vessels, open bowls, well fired, comb-stamped, horizontal band of parallel grooves • Fe broken rods Total at livestock at site: • 10 (N) cattle, 2 (N) goat, • Lower grindstone
RUU39 Namibia	**Ruuga N98/39** Inland open-air site/Iron working	1440±35 KN-5577	AD 630 – 673	-	3	6 – 7	6	• Pottery similar to Divuyu and Bambata. • Fe working

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3.3.1. S1 Table. The archaeological evidence for the appearance of livestock, pottery, metal and crops in southern Africa (Database 1).

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	groups/ceramic later stone age [99, 152]							
KAD Zimbabwe	**Kadzi** Inland open-air riverside site/farmer [78, 153, 154]	1475±70 Ua-4106 1445±80 Ua-4105	AD 548 – 671 AD 548 – 762	AD 633	2	6	8	• Kadzi pottery: thick profiles, out-turned lips (decorated), rims with comb-stamping • Fe artefacts, Cu artefacts, Fe slag, tuyere • 1 (M) sheep, 1 (M) cattle, c.f. 1 (M) goat, 3 (M) sheep/goat • Finger millet (Eleusine coracana)
MON Zambia	**Mondake** Inland open-air site (Pit)/farmer [61]	1510±105 NZ-4997 1355±60 NZ-4998	AD 444 – 665 AD 656 – 768	AD 634	2	6	7	• Pottery similar to M'teteshi site • Fe ring, Fe spear, Fe bangle fragments, Fe rod, Fe razor, Fe flat fragment, Fe blade fragments, **(2b**) Cu clips • Sorghum sp.
HAA South Africa	**Haaskraal Shelter** Inland rock shelter/hunter- herder [7, 41]	1400±50 Gr-A13540 **Fibre from pot**	AD 636 – 765	-	1	6 – 7	1	• Pottery with mineral and grass inclusion.
BAN Malawi	**Banda Hill** Open-air site/farmer [101, 155]	1400±50 Pta-1602	AD 636 – 765	-	3	6 – 7	6i	• Nkope pottery: carinated and sub-carinated pots, 10-20mm thick, fine-grit. • Fe slag • Pits, daga (no structures identified).
MLP South Africa	**Mhlopeni** Inland open-air riverside site/farmer [156, 157]	1400±50 Pta-2878	AD 636 – 765	-	3	6 – 7	9i	• Msuluzi type pottery: everted and curved necked pots with bands of decoration on neck (alternating cross-hatching, herringbone designs), body decoration is present but less common than Mzonjani ware, some burnish

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3.3.1. S1 Table. The archaeological evidence for the appearance of livestock, pottery, metal and crops in southern Africa (Database 1).

Site ID and country	Site Name Type of site References	Radiocarbon date Lab number	Calibration at 68.2% probability (BC or AD)	Median date	Grade of date 1 – 3	Temporal group 1 – 8	Database code 1 – 10 i-ii	List of archaeological traits
								with red or black, bosses present, bowls are sub-carinated and thick, mostly undecorated. • Fe beads, Fe slag, 3 (M) sheep, 1 (M) sheep/goat • Human burial with sheep mandible, human burials with grindstones • Lower grindstones • Clay human figurines decorated or showing scarification, clay human figurine (hand with fingers).
KGG South Africa	**KwaGandaganda** Inland open-air riverside site/farmer [158, 159, 160]	1395±60 Wits-1918	AD 639 – 765	-	2	6 – 7	9ii	• Msuluzi type pottery: everted and curved necked pots with bands of decoration on neck (alternating cross-hatching, herringbone designs), body decoration is present but less common than Mzonjani ware, some burnish with red or black, bosses present, bowls are sub-carinated and thick, mostly undecorated. • Fe beads, Cu beads, Fe slag, Fe tuyere, Fe ore • 175 (N) sheep, 63 (N) cattle, 9 (N) goat, 175 (N) sheep/goat • Pit, daga (no structure identified), livestock byre (dung deposit). "The relationship between central and residential areas suggests that the settlement was organized according to the CCP and therefore supports the position that the CCP and its associated worldview were present in South Africa by about the eighth century AD" [159: 39].

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3.3.1. S1 Table. The archaeological evidence for the appearance of livestock, pottery, metal and crops in southern Africa (Database 1).

Site ID and country	Site Name Type of site References	Radiocarbon date Lab number	Calibration at 68.2% probability (BC or AD)	Median date	Grade of date 1 – 3	Temporal group 1 – 8	Database code 1 – 10 i-ii	List of archaeological traits
								• Infant pot burial • Upper grindstones, lower grindstones • Clay horn figurines, clay human figurines, clay human figurines some decorated or scarification.
CHO Zambia/Malawi Border	**Chowo River** Inland open-air river site/farmer [96]	1410±40 Beta-182953 1370±90 Beta - 182954	AD 640 – 755 AD 635 – 843	-	2	6 – 7	6i	• Chifumbaze Complex type pottery: simple stamped impressions in horizontal bands, thickened rounded rims. • Fe rusted clumps • Daga
NMK Zambia	**Namakala** Open-air site/ farmer [161, 162]	1360±80 N-2317	AD 643 – 839	-	3	6 – 7	5	• Early farming pottery • Cu wound bangle
MAM South Africa	**Mamba** Inland open-air riverside site/farmer [163, 164]	1390±50 Pta-4093 1320±50 Pta-3716	AD 643 – 765 AD 675 – 839	-	2	6 – 7	9ii	• Msuluzi type pottery: everted and curved necked pots with bands of decoration on neck (alternating cross-hatching; herringbone designs); body decoration is present but less common than Mzonjani ware, some burnish with red or black, bosses present, bowls are sub-carinated and thick, mostly undecorated and Ndondondwane type pottery with similarities to Msuluzi: narrow multiple bands of decoration on neck, less decoration on body and shoulder of pot, cross-hatching more common. • Fe slag, tuyere, Fe ore, furnace wall and base • 10 (M) sheep, 37 (M) cattle, 1 (M) goat, 25 (M) sheep/goat • Pit, pole-impressed daga, livestock byre

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3.3.1. S1 Table. The archaeological evidence for the appearance of livestock, pottery, metal and crops in southern Africa (Database 1).

Site ID and country	Site Name Type of site References	Radiocarbon date Lab number	Calibration at 68.2% probability (BC or AD)	Median date	Grade of date 1 – 3	Temporal group 1 – 8	Database code 1 – 10 i-ii	List of archaeological traits
								• Lower grindstone with elliptical grooves • Sculptured clay heads
UNC Mozambique	**University Campus** Open-air site/farmer [71]	1355±100 St-9837	AD 644 – 857	-	2	6 – 8	6i	• Matola type pottery: fluted rims, single bands of horizontal line incisions with diagonal or cross-hatched incisions on shoulder and body, thickened rims, 7-8mm wall-thickness, discontinuous motif on body of pot. • Fe artefacts, Fe slag • Pits associated with smelting debris, daga remains (no identifiable floor or feature).
JKKB South Africa	**Jakkalsberg B** Inland open-air site /pastoralist [13, 165, 166, 167]	1380±50 Pta-6101	AD 648 – 765	-	2	6 – 7	4	• Majority of pottery undecorated with quartz inclusion, red in colour, some decoration on rim. • Fe corroded fragments • 4 (M) sheep, 12 (M) sheep/goat
WIT South Africa	**Witklip** Coastal LSA rock shelter/hunter-herder [121]	1380±50 Pta-4608	AD 648 – 765	-	3	6 – 7	3	• Shell-stamped pottery: spouts and some lugs, jars, 6mm thick, some incised decoration. • Sheep: "A small number of sheep (from levels BSWS and OMSW) and grey duiker bones are represented but as they are from the same size class, it is uncertain which might dominate among the small medium bovids" [121: 75]. • Ochre stained upper grindstone
MGR Botswana	**Magarape** Inland open-air riverside site/farmer [168, 169]	1350±80 KN-2641	AD 648 – 841	-	3	6 – 7	7i	• Mzonjani type pottery [169] or Kalundu type pottery [168] • Fe fragments, Fe slag • Carbonized sorghum

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3.3.1. S1 Table. The archaeological evidence for the appearance of livestock, pottery, metal and crops in southern Africa (Database 1).

Site ID and country	Site Name Type of site References	Radiocarbon date Lab number	Calibration at 68.2% probability (BC or AD)	Median date	Grade of date 1 – 3	Temporal group 1 – 8	Database code 1 – 10 i-ii	List of archaeological traits
								• Pits, burnt post-hole, 65 burnt hut floors (possibly arranged in circular pattern), stone floors, cairn. LSA micro-lithics present at site.
MES Namibia	**Messum 1** Inland LSA rock shelter [3, 18, 170]	1370±50 Pta-2681	AD 652 – 765	-	2	6 – 7	5	• No description of pottery • Fe artefact
BYN South Africa	**Bynekranskop** Coastal LSA cave site/pastoralist [15, 171]	1370±60 OxA-3863 **sheep AMS**	AD 652 – 765	-	1	6 – 7	3	• Mostly undecorated pottery, spouts present. Total livestock at site: • 11 (M) sheep
WOS South Africa	**Wosi** Inland open-air riverside site/farmer [172, 173, 174]	1460±50 Pta-4100 1430±60 Pta-4104	AD 592 – 662 AD 595 – 757	AD 652	2	6	9	• Msuluzi type pottery: everted and curved necked pots with bands of decoration on neck (alternating cross-hatching, herringbone designs), body decoration is present but less common than Mzonjani ware, some burnish with red or black, bosses present, bowls are sub-carinated and thick, mostly undecorated. • Little evidence of Fe working • 20 (M) sheep, 2 (M) cattle, 2 (M) goat, 45 (M) sheep/goat • Pits, • Upper grindstones, lower grindstones
MSC South Africa	**Msuluzi Confluence** Inland open-air riverside site/farmer [174, 175]	1370±30 Pta-2193 1310±40 Pta-2195	AD 654 – 763 AD 680 – 835	-	2	6 – 7	9i	• Msuluzi type pottery: everted and curved necked pots with bands of decoration on neck (alternating cross-hatching, herringbone designs), body decoration is present but less common than Mzonjani ware, some burnish

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3.3.1. S1 Table. The archaeological evidence for the appearance of livestock, pottery, metal and crops in southern Africa (Database 1).

Site ID and country	Site Name Type of site References	Radiocarbon date Lab number	Calibration at 68.2% probability (BC or AD)	Median date	Grade of date 1 – 3	Temporal group 1 – 8	Database code 1 – 10 i-ii	List of archaeological traits
								with red or black, bosses present, bowls are sub-carinated and thick, mostly undecorated. • Fe slag, tuyere, Fe ore • 4 (M) sheep, 2 (M) cattle, 4 (M) sheep/goat • Pits, • Human burial with pot • Upper grindstone, lower grindstone (U-shaped) • Clay 'horn'/cattle figurines (?)
BIS Botswana	**Bisoli** Inland open-air site/farmer [52, 90, 168]	1340±60 Wits-1099 1240±80 I-12708	AD 657 – 830 AD 692 – 966	-	2	7	3	• Bisoli pottery: rolled rims, parallel broad lines on neck and decoration on shoulder (origins with Bambata type pottery) and/or possibly Ziwa/Gokomere type pottery. • Domestic animals are present but no count provided nor type of domesticate.
MPM South Africa	**Mpame** Coastal open-air site/farmer [176]	1340±60 Pta-2019 1230±40 Pta-2045	AD 657 – 830 AD 773 – 892	-	2	7– 8	3	• Mzuluzi type pottery • Cattle (?) (not analysed)
KBE South Africa	**Kasteelberg E** Coastal boulder site/hunter-herder/pastoralist [48]	1360±50 Pta-7455	AD 659 – 765	-	2	7	1	• Shell-stamped pottery: spouts, jars, 6mm thick, some incised decoration.
WEL South Africa	**Welgeluk** Inland LSA rock shelter/hunter-gatherer [59]	1360±50 Pta-3960	AD 659 – 765	-	3	7	1	• Albany ware: well-baked, thin-walled, globular shaped pots with shallow grooved or impressed bands, red burnish occurs on some pots.
TMB	**Tambala**	1360±50	AD 659 – 765	-	3	7	7i?	• Nkope pottery

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Malawi	Open-air site/farmer [177]	Pta-927						• Fe arrowheads, Fe razor, Cu ring, Cu anklet, Fe slag • Daga • Basket grain-storage bin(?)
MAG South Africa	**Magogo** Inland open-air riverside site/farmer [156, 157]	1360±50 Pta-2874 1320±50 Pta-3716	AD 659 – 765 AD 675 – 839	-	2	7	8i	• Msuluzi type pottery • Fe beads and blade, Fe slag, tuyere, furnace walls (?) • 2(M) sheep, 13 (M) cattle, 28 (M) sheep/goat • Bulrush millet (eleusine corocana), melon, • Pits, daga (no structure identified besides possible furnace) • Upper grindstone, lower grindstone • Clay 'horn' figurines, Clay human figurines with decoration or scarification.
JKKA South Africa	**Jakkalsberg A** Inland open-air site/pastoralist [13, 165, 166, 167]	1330±60 Pta-5958 1300±25 Pta-6100	AD 663 – 838 AD 684 - 836	-	2	7	3	• Majority of pottery is undecorated, red colour sherds, lug present Total livestock at site: • 29 (M) sheep
DK1 South Africa	**Die Kelders** Coastal LSA rock shelter/pastoralist [29]	1325±60 OxA-3860 **sheep AMS** 1290±60 OxA-3961 **sheep AMS** 1465±100 Gx-1685	AD 670 – 840 AD 685 – 860 AD 520 -765	-	1	7	3	• Thin-walled pottery with quartz inclusion, globular or bag-shaped, undecorated, black with red-slip and shell-stamped pottery as well as mostly undecorated pottery with pointed base, spout and bosses, 5.9mm thick. • 2 (M) sheep, 2 (M) cattle (?) (not associated with radiocarbon determination).

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3.3.1. S1 Table. The archaeological evidence for the appearance of livestock, pottery, metal and crops in southern Africa (Database 1).

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SBC South Africa	**Steenberg's Cove** Coastal boulder site/hunter-gatherer [48]	1350±50 Pta-4010 1280±50 Pta-4012 marine shell (corrected)	AD 670 – 766 AD 691 – 876	-	3	7	3	• Shell-stamped pottery with spouts and some lugs, mostly jars, 6mm thick, some incised decoration. One sherd with two horizontal lines. • 2 (M) sheep
OBP South Africa	**Olieboomspoort** Inland LSA rock shelter/hunter-gatherer [32]	1330±50 Pta-7418 1310±40 Pta-7780	AD 671 – 831 AD 680 – 835	AD 754	2/3	7	3	• Bambata A pottery: thin-walled, jars, spout and bosses, grey to black with red slip, comb-stamped and incision, ripple rims. Happy Rest, Eiland, Broedhurst and Icon/Moloko pottery were found in the same stratigraphic levels as Bambata A pottery at different frequencies. • Sheep/goat are present but only in more recent occupation levels.
LIK Lesotho	**Likoaeng** Inland LSA rock shelter/hunter-herder [66, 67, 178]	1285±40 GrA-23237 **sheep AMS**	AD 675 – 767	-	1	7	2	• 1 (M) sheep, 1 (M) sheep/goat
PLT South Africa	**Plaston** Inland open-air riverside site/farmer [179]	1315±50 Pta-1635	AD 677 – 965	-	3	7 – 8	1	• Mzonjani type pottery • Lower grindstone (grooved)
BLNM South Africa	**Balerno Main** Inland LSA rockshelter/hunter-gatherer [180]	1340±40 Pta-8603	AD 678 – 765	-	3	7	1	• Bambata A pottery: thin-walled, jars, spout and bosses, grey to black with red slip, comb-stamped and incision, ripple rims and Mzonjani pottery and Happy Rest pottery present.

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CHO Zambia/Malawi Border	**Chowo River** Inland open-air river site/farmer [96]	1340±40 Beta-182952	AD 678 – 765	-	2	7	6i	• Chifumbaze Complex type pottery: simple stamped impressions in horizontal bands, thickened rounded rims. • Fe rusted clumps • Daga
KBB South Africa	**Kasteelberg B** Coastal boulder site/hunter-herder/Pastoralist [36, 44, 45, 46, 47, 48]	1310±50 Pta-4373 1300±60 Pta-3995 1220±45 Pta-3998 1200±45 Pta-3994	AD 679 – 841 AD 682 – 857 AD 774 – 960 AD 790 – 974	-	2		3	• Shell-stamped pottery with spouts and some lugs, jars, 6mm thick, some incised decoration (Cape coastal pottery). Total livestock at site: • 138 (M) sheep, 7 (M) cattle, • Grooved (boat-shaped) lower grindstones
CHU Zambia	**Chundu** Inland open-air site/farmer [181, 182]	1290±100 N-1138 1160±160 N-1139	AD 680 – 881 AD 688 – 1044	-	2	7 – 8	4	• Kumadzulo and Kamangoza type pottery • Fe hoes, Fe arrowheads, Fe axe, Cu bangles • 2 (M) cattle • Human burial with livestock remains (2 cattle skulls) • Clay cattle figurine (?)
ORU Namibia	**Orunwanje 95/1** Inland LSA rock shelter/Herding [22, 23]	1306±36 UtC-5946 1280±28 KN-5004 1255±40 UtC-5948 1252±36	AD 681 – 838 AD 766 – 895 AD 773 – 879 AD 773 – 880	-	2	7 – 8	3	• Pottery with grooved horizontal and diagonal lines, incised lines, occasional cross-hatching, oblique parallel lines, black to grey to brown in colour, 6.3mm wall-thickness, fine to medium sized quartz inclusions, spout present. • Sheep, goat

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3.3.1. S1 Table. The archaeological evidence for the appearance of livestock, pottery, metal and crops in southern Africa (Database 1).

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		UtC-5945						
BLY South Africa	**Blydefontein** Inland large rock shelter/hunter- herder [62, 63, 64, 65, 66, 67, 68]	1305±31 SMU-1850 (HG) 1255±109 SMU-1925 (CPB)	AD 682 – 837 AD 683 – 960	-	2	7 – 8	1	• (1) Fibre tempered pottery: described as grass tempered plain ware mostly shaped into bowls or bag-shaped pots and undecorated. (2) Undecorated thin-walled ware described as silt tempered, coil-built pottery with grass and silt temper. (3) Khoe pottery occurs in more recent layers.
LEB South Africa	**Lebalelo** Inland open-air site/farmer [183]	1300±50 Pta-8772	AD 682 – 857	-	3	7	3i	• Mzonjani/Broederstroom pottery • 1 (M) sheep/goat • Pits lined with dung, daga
LPK Zimbabwe	**Leopard's Kopje** Inland open-air site/farmer [52, 184, 185, 186]	1280±90 SR-225 1250±110 SR-55 1130±95 I-4862	AD 682 – 885 AD 684 – 964 AD 780 – 1037	-	2	7 – 8	8ii?	• Zhizo pottery characterized with the appearance of beakers, graphite burnish on bowls (some red haematite used on vessels), similar to Gokomere pottery. • Cu bangles, Fe slag, • 79 (M) cattle, 162 (M) sheep/goat • Cow peas (although the relationship to radiocarbon dates and early occupation is tenuous due to disturbance at the site) • Pits, daga (structures were not identified at the site), **(5f)** sheep/goat byre
TAU Botswana	**Taukome** Inland open-air site/farmer [40]	1265±80 I-11407 1240±80 I-11410	AD 684 – 889 AD 692 – 966	-	2	7 – 8	3ii	• Zhizo/Taukome pottery • Cattle, sheep/goat (Total at site: 149 M) • Livestock byre

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3.3.1. S1 Table. The archaeological evidence for the appearance of livestock, pottery, metal and crops in southern Africa (Database 1).

Site ID and country	Site Name Type of site References	Radiocarbon date Lab number	Calibration at 68.2% probability (BC or AD)	Median date	Grade of date 1 – 3	Temporal group 1 – 8	Database code 1 – 10 i-ii	List of archaeological traits
RSF South Africa	**Roosfontein** Inland LSA rockshelter/Hunter-gatherer/pastoralist [187, 188]	1290±50 Pta-5931	AD 685 – 858	-	2	7 – 8	1	• Grit tempered, undecorated pottery: unburnished and buff-brown-grey in colour; 6 -8 mm thick.
MATL Botswana	**Matlapaneng** Inland open-air site/farmer [76, 90, 189]	1270±80 1260±60 1190±80 1120±110	AD 685 – 886 AD 690 – 888 AD 778 – 988 AD 793 – 1136	-	2	7 – 8	8	• Pottery similar to Kumadzulo and Dambwa in Zambia • Few Fe artefacts • 38 (M) cattle, 42 (M) sheep/goat • Sorghum
NTS South Africa	**Ntsitsana** Inland open-air riverside site/farmer [190]	1290±50 Pta-4684 1180 ± 50 Pta-4687 1180 ± 50 Pta-4695	AD 685 – 858 AD 876 – 989 AD 876 – 989	-	2	7 – 8	9ii	• Mzuluzi and Ndondondwane pottery • Fe slag, tuyere • Pits, daga, burnt hut floors, livestock byre • Upper grindstones • Clay human figurines, clay human figurine with decoration
KAD Zimbabwe	**Kadzi** Inland open-air riverside site/farmer [78, 153, 154]	1290±50 Ua-3195	AD 685 – 858	-	2	7 – 8	8	• Kadzi pottery • Fe artefacts, Cu artefacts, Fe slag, tuyere • 1 (M) sheep, 1 (M) cattle, c.f. 1 (M) goat, 3 (M) sheep/goat • Finger millet (Eleusine coracana)
NAN South Africa	**Nanda** Inland open-air riverside site/farmer [191, 192, 193]	1275±60 Wits-1917	AD 690 – 880	-	3	7 – 8	9i	• Msuluzi pottery: everted and curved necked pots with bands of decoration on neck (alternating cross-hatching, herringbone designs), body decoration is present but less common than Mzonjani ware, some burnish with red or black, bosses present, bowls are sub-carinated and thick, mostly undecorated.

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3.3.1. S1 Table. The archaeological evidence for the appearance of livestock, pottery, metal and crops in southern Africa (Database 1).

Site ID and country	Site Name Type of site References	Radiocarbon date Lab number	Calibration at 68.2% probability (BC or AD)	Median date	Grade of date 1 – 3	Temporal group 1 – 8	Database code 1 – 10 i-ii	List of archaeological traits
								• Fe slag, tuyere, Fe ore, • 16 (M) sheep, 14 (M) cattle, 5 (M) goat, 34 (M) sheep/goat • Pits, daga (no structure identified) • Human burials with pots • Clay human figurines, clay 'horn' figurines
NGA Zambia	**Nanga** Inland open-air site/farmer [161, 162, 194]	1240±100 Birm-836 1190±100 Birm-835	AD 690 – 967 AD 773 – 991	-	3	7 – 8	3	• Two phases of Early farmer ware were recognized at the site • 23 (M) cattle, 3 (M) sheep/goat • Clay human figurines
MWE Zimbabwe	**Mwenezi** Inland hillside midden/farmer [195]	1250±75 Ua-11802	AD 690 – 952	-	2	7 – 8	2	• 1 (M) sheep, 1 (M) cow, 1 (M) goat, 1 (M) sheep/goat (all from level 3 associated with radiocarbon date) (accessed through one report)
KBC South Africa	**Kasteelberg C** Coastal LSA rock shelter/hunter-herder/pastoralist [48]	1270±50 Pta-3785	AD 692 – 883	-	2	7 – 8	3	• Shell-stamped pottery with spouts, jars, 6mm thick, some incised decoration. • 4 (M) sheep
SPR South Africa	**Spoegrivier** Coastal LSA cave site/pastoralist [13, 14, 15]	1260±50 GrA-9027 **sheep AMS** 1390±50 Pta-4753	AD 694 – 888 AD 643 – 765	-	1	7 – 8	3	• Thin-walled pottery with quartz inclusion, horizontal grooves and undecorated. • sheep

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3.3.1. S1 Table. The archaeological evidence for the appearance of livestock, pottery, metal and crops in southern Africa (Database 1).

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AB1 South Africa	**Atlantic Beach 1** Coastal shell midden site/herder [86]	1825±15 Pta-7792 shell 1800±50 Pta-7792 shell	AD 695 – 798 AD 703 – 729	-	2	7	3i	• Shell-stamped pottery similar to Die Kelders and Kasteelberg: parallel grooved sherd, spout, red slip. • 3 (M) sheep, stone feature (circular possible stone packed hearth) association to dates however are not secure. • Broken lower grindstone with ochre staining
KMG Zambia	**Kamangoza** Inland open-air site/farmer [196]	1015±105 N-419 1040±105 N-421 975±105 N-457 940±105 N-423 900±105 N-426 900±105 N-424 870±105 N-425	AD 987 – 1185 AD 908 – 1176 AD 1023 – 1207 AD 1035 – 1218 AD 1046 – 1271 AD 1046 – 1271 AD 1048 - 1285	AD 700 – 800	3 'All of these samples came from the contact zone between the lowest part of the mound deposit and the sterile sand and should have dated the foundation of the midden. In actual fact, these dates are among the latest and obviously influenced by the extreme cultural	7 – 8	5i	• Kamangoza pottery showing affiliation to Kalundu, Dambwa and Kumadzulo ware. • Fe arrowheads, Fe knife, Fe chisel, Fe razor, Fe bodkin, Fe needle, Cu wire, Cu bangle frag, Cu ring (?) • Pits

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					mixture seen in the artifact distributions.' [196: 85]			
ZMF Zambia	**Zambezi Farm** Inland open-air site/farmer [182]	1410±130 N-1140	AD 544 – 856	AD 700 Noted by the excavator for when the site was most likely occupied.	3	7	4i	• Pottery similar to Kalundu, Dambwa and Kumadzulo ware. • Fe hoe, Fe bangle, Fe arrowheads, Fe bodkins, Fe chisel, Cu strip and wire • Cattle (count not provided) • Pits, post-holes with daga (no floors) sub-rectangular in shape.
BOS Botswana	**Bosutswe** Inland hilltop open air site/farmer [40, 197, 198]	1400±60 (East) TX-6991 1370±60 (East) TX-6994 (Test Pit excavations)	AD 635 – 765 AD 652 – 765	AD 705	2	7	4ii?	• Zhizo/Taukome pottery • Cu beads and helix • 2 (M) sheep, 10 (M) cattle, 2 (M) goat, 9 (M) sheep/goat. Cattle outnumber or are equal to the number of sheep present during this time period. Hunted game make up 60% of the faunal assemblage. • Central shallow dung deposit (livestock byre)
DIV Botswana	**Divuyu** Inland open-air site/specularite miners/farmer [189, 199]	1400±70 Beta-13260 1370±60 Beta-13269 1330±60 Beta-13264 1330±60	AD 635 – 766 AD 652 – 765 AD 663 – 838 AD 663 – 838	AD 723	2	7	9i	• Divuyu pottery related to Spaced Curvilnear Ware with origins from Congo and northern/central Angola and possibly associated with matrilineal groups: most vessels are small, diameters between 10cm and 16 cm, globular jars, straight sided bowls, in turned rim bowls, shouldered neck bowls, hemispherical bowls. The majority of

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3.3.1. S1 Table. The archaeological evidence for the appearance of livestock, pottery, metal and crops in southern Africa (Database 1).

Site ID and country	Site Name Type of site References	Radiocarbon date Lab number	Calibration at 68.2% probability (BC or AD)	Median date	Grade of date 1 – 3	Temporal group 1 – 8	Database code 1 – 10 i-ii	List of archaeological traits
		Beta-13265 1220±70 Beta-13267 1190±70 Beta-13266	AD 772 – 967 AD 780 – 987					pots have multiple bands of cross-hatch, comb-stamping, punctates or incisions, charcoal tempered. Four bowls with spouts or lugs**.** Similarities are also found with the pottery at Nqoma. • Fe jewelry, Cu jewelry, Fe slag, Fe ore (?) Total livestock at site: • 76 (M) sheep, 6 (M) cattle, 10 (M) goat, 62 (M) sheep/goat • Pole-impressed daga • Human burial with no grave goods
OVI Namibia	**Ovizorombuku 96/1** Inland LSA rock shelter site [23]	1275±30 KN-5373	AD 768 – 874	-	2	7 – 8	1	• Pottery with 5.5mm wall-thickness, quartz grit, well-fired, some burnished sherds (ochre and black), incised horizontal and/or oblique lines, some cross-hatching and one sherd with herringbone-like motif and another with possible finger-nail impressions.
IGI Zambia	**Ingombe Ilede** Inland hilltop site/farmer [128]	1120±200 SR-22 1150±100 SR-23	AD 767 – 1159 AD 778 – 1025	-	2	7 – 8	8i	• Kangila type pottery: straight necked bowls with round bodies and globular necked pots with a band of decoration (mostly incised or comp-stamped), some graphite burnish, lugs and spouts are present but rare. • Fe gongs, Fe hoes (ceremonial and functional), Fe axe, Fe razors, Fe chisels, Fe fish-hooks, Fe rings, Fe bangles and tubes, Cu bangles, Cu crosses (ingot), Cu razor, Cu needles, Cu spindle whorls, Fe slag (not common)

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Site ID and country	Site Name Type of site References	Radiocarbon date Lab number	Calibration at 68.2% probability (BC or AD)	Median date	Grade of date 1 – 3	Temporal group 1 – 8	Database code 1 – 10 i-ii	List of archaeological traits
								• 6 (N) cattle, 30 (N) sheep/goat (total livestock for level one is 122 (N) • Sorghum • Pits, daga (no structure identified) • 31 human burials with grave goods including human burial with dental alteration and human burials with livestock remains. • Upper grindstone, lower grindstone • Clay human figurines with decoration.
DIA South Africa	**Diamant** Inland open-air site/farmer [52, 200]	1250±45 Pta-5216 1240±50 Pta-3620	AD 770 – 885 AD 769 – 948	-	2	7 – 8	3ii	• Diamant type pottery • 24 (N) cattle, 93 (N) sheep/goat • Pits lined with dung, daga, livestock byre
KNO Namibia	**Kanono Mulapo** Dune shell midden site with farmer pottery/Hunter-gatherer [201]	1230±50 Pta-8656 **Charcoal extracted from pottery**	AD 770 - 960	-	1	7 – 8	1	Total at site: • Kalomo pottery showing similarities to Kalundu and Gundu (Naviundu from Congo (western origin)) is an ancestor to Gundu pottery. Five vessels with comb-stamping on the rims and band of triangular impressions. Some incised motifs are present. The pottery was associated with shell.
CHB Mozambique	**Chibuene** Coastal trading station/farmer [202, 203, 204]	1410±75 Ua-16272 1400±85 St-8495 1270±80 St-8494 1235±50 Ua-16270	AD 601 – 765 AD 601 – 769 AD 685 – 886 AD 770 – 946	AD 776	2	7	3	• (1) Matola pottery and (2) Triangular Incised Ware (origins from East African coast) • 1 (N) sheep, 6 (N) cattle, 3 (N) goat, 8 (N) sheep/goat The Matola classified pottery does not correlate with the radiocarbon dates.

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3.3.1. S1 Table. The archaeological evidence for the appearance of livestock, pottery, metal and crops in southern Africa (Database 1).

Site ID and country	Site Name Type of site References	Radiocarbon date Lab number	Calibration at 68.2% probability (BC or AD)	Median date	Grade of date 1 – 3	Temporal group 1 – 8	Database code 1 – 10 i-ii	List of archaeological traits
		1225±70 Ua-12267	AD 770 – 966					
BRD South Africa	**Broederstoom** Inland open-air site/farmer [135, 136, 137, 129, 52]	1350±80 KN-2641 1320±100 Fra-88 1335±60 Wits-1475	AD 648 – 841 AD 667 – 862 AD 660 – 833	AD 752	2	7	8ii	• Mzonjani/Broederstroom pottery reclassified from a Kalundu (western stream) origin [129]. • Fe artefacts, Cu beads and chain links, Fe slag, tuyere, **F**e working (forges), Fe ore Total livestock at site: • 1 (M) cow, 42 (M) sheep/goat • Pits dung lined, post-hole impressed daga, hut floors (no complete residential unit found), grain-bins, cattle byre • Human burial with grave goods, human burial with dental alteration, infant pot burial • Upper grindstones, lower grindstones with lenticular grooves
KBA South Africa	**Kasteelberg A** Coastal boulder site/hunter-herder/Pastoralist [36, 44, 45, 46, 47, 48]	1230±40 Pta-5937	AD 771 – 956	-	2	7 – 8	3	• Shell-stamped pottery with spouts and some lugs, 6mm wall-thickness, jars (Cape coastal pottery)**.** Total livestock at site: • 34 (M) sheep, 2 (M) cattle (mostly in the upper levels)
KKH South Africa	**Klein Kliphuis** Inland LSA rock shelter site/hunter-gatherer [205, 206]	1230±50 Pta-4672	AD 771 – 954	-	3	7 – 8	3	• Pottery with fine quartz temper, black to grey in colour, some ochre burnish (largely undiagnostic) • 1 (M) sheep • Upper grindstone

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CHD Zambia	**Chondwe** Inland open-air site/farmer [115, 128, 207]	1135±130 GX-1009 1150±145 N-997	AD 773 – 1127 AD 767 – 1130	-	2	7 – 8	6i	• Chondwe Group: the lower levels yielded potsherds of Early Iron Age type characterized by thick fabric, gritty or sandy paste, and thickened or undifferentiated rims. The most frequent decorative motifs are lines of false-relief chevron stamping and designs composed of segmental blocks of comb-stamping delineated by broad grooves. A limited number of incised designs also occur. Undecorated vessels are rare. Two sherds with applied bosses. • Fe bead, Cu strips, Fe slag, tuyere • Daga (no pole-impressions identified or hut floors) • Lower grindstone with lenticular grooves (surface find). Chipped quartz artefacts of LSA type recovered.
KUL South Africa (Most southerly spread of farmers)	**Kulubele** Inland open-air riverside site/farmer [208]	1250±40 Pta-5865	AD 773 – 881	-	3	7 – 8	1i	• Mzuluzi pottery and/or Ndondondwane pottery • Pits, daga (no structured identified)
SCO South Africa	**Scott's Cave** Coastal small rock shelter/hunters-with-sheep [209, 210, 211]	1190±100 SR-82	AD 773 – 991	-	3	7 – 8	2	• 1 (M) sheep
BJP South Africa	**Biesje Poort**	1210±70 Pta-4772	AD 774 – 970	-	2	7 – 8	1	• Pottery assemblage found with two spout fragments, two decorated with incised lines

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	Inland open-air site/herder [74, 94, 109]							and row of punctates. Burnished sherds, some grass tempering, relatively thin-walled (5.3mm).
MGR Botswana	**Magagarape** Inland open-air site/farmer [168]	1220±50 Beta-30641	AD 774 – 961	-	3	7 – 8	7i	• Baratani pottery • Fe artefacts, Fe slag • Sorghum • Pits, post-holes, 65 burnt daga features (hut floors) (no definite layout could be discerned but possibly circular), stone floors and stone cairn. LSA micro-lithics and ostrich eggshell beads were recovered from the site.
NDD South Africa	**Ndondondwane** Inland open-air riverside site/farmer [174, 212, 213, 214]	1220±50 Pta-238	AD 774 – 819	-	2	7	8ii	• Ndondondwane pottery with similarities to Msuluzi pottery: narrow multiple bands of decoration on neck, less decoration on body and shoulder of pot, cross-hatching more common. • Fe rolled strip, Cu bead • 459 (N) sheep, 960 (N) cattle, 47 (N) goat, 1458 (N) sheep/goat • Bulrush millet • Burnt daga floors (one possibly beehive shaped and possibly men's hut due to its location near iron working area and byre), livestock byre, furnace remains • Infant burial in pot • Upper grindstone, lower grindstone • Clay sculpted heads

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KANG Zambia	**Kangonga** Inland open-air site/farmer [207, 215]	1185±85 GX-1327	AD 776 – 990	-	3	7– 8	6i	• Chondwe Group: the lower levels yielded potsherds of Early Iron Age type characterized by thick fabric, gritty or sandy paste, and thickened or undifferentiated rims. The most frequent decorative motifs are lines of false-relief chevron stamping and designs composed of segmental blocks of comb-stamping delineated by broad grooves. A limited number of incised designs also occur. Undecorated vessels are rare. • Fe slag • Pole-impressed daga
WON South Africa	**Wonderwerk** Inland LSA Cave site/hunter-herders/pastoralist [87]	After 1210±50 Pta-2546	After AD 777 - 967	-	3	7 – 8	3?	• Undecorated pottery, 5.6mm thick-walled, black. • sheep/goat (?)
SK17 South Africa	**SK17** Inland open-air site/farmer [138, 139, 52]	1210±50 Pta-3507	AD 777 – 967	-	3	7 – 8	3	• Garonga pottery [52] or Kalundu (Ndondondwane/Lydenburg) pottery [138,139] • 1 (M) cattle, 5 (M) sheep/goat
QOG Botswana	**Qogana** Inland open-air site/farmer [40, 90]	1190±80	AD 778 – 988	-	3	7 – 8	1i	• Pottery similar to Matlapaneng • Burnt reed-impressed clay hut
WOS South Africa	**Wosi** Inland open-air riverside site/farmer [172, 173, 174]	1290±50 Pta-4094 1270±60 Pta-4095	AD 685 – 858 AD 690 – 883	AD 779	2	7	9i	• Ndondondwane pottery with similarities to Msuluzi pottery: narrow multiple bands of decoration on neck, less decoration on body

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								and shoulder of pot, cross-hatching more common. • Fe artefacts, Fe slag • 80 (M) sheep, 36 (M) cattle, 6 (M) goat • Pits, pole-impressed daga, hut floor • Human burial without grave goods • Upper grindstones, lower grindstones • Hollow clay sculpted heads (therianthropic 'horns')
KLD Zambia	**Kalundo Mound** Inland open-air mound site/farmer [17]	1160±90 SR-41	AD 780 – 1020	-	2	7 – 8	8i?	• Kalundu pottery: multiple band decoration on neck, shouldered vessels, thin-walled, globular shaped pots, bowls, thick-walled, spouts, lugs and bosses are present (but not numerous), burnishing present (mostly graphite around necked pots and bowls), comb-stamping common feature of decoration, increase in bag-shaped pots with increase in livestock at site. • Fe strip, Cu bracelet, Fe slag (small amount), Fe tuyere (1 piece), bellow nozzles Total livestock at site: • 3(N) cattle, sheep/goat (number not provided) • Pits, daga (no identifiable floor), grain-bin (?) • Human burials with no grave goods • Clay humped cattle figurines
KLF Zambia	**Kalambo Falls (Site A)**	1080±180 L-395B	AD 780 – 1184	-	2	7 – 8	6i	• Kalambo pottery: channel decorated with the majority of vessels from Site A being

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	Inland open-air hill site/farmer [112, 113]							undecorated body sherds. Some thin-walled dark grey sherds were also present. Three different types of ceramics identified. • Fe fragments, Cu bracelet or anklet, Cu conical object, Fe slag • Pit, daga (no identified structure) • Upper grindstone, lower grindstone
DC19 Swaziland	**2531DC19** Inland open-air site. Pottery from survey and test pit excavation/farmer [216]	AD780±40 X-186 **Pottery OSL**	AD780±40	-	1	7	1	• Mzonjani pottery: pots with straight or everted necks, single horizontal grooved decoration (impressions or incision) below lip, discontinuous body decoration on pot, 'wavy', zig-zag, chevron designs, bowls: thick, sub-carinated with horizontal grooved decoration below carination.
DAM Zambia	**Dambwa** Inland open-air site/farmer [128]	1350±100 SR-106 1330±110 SR-62 1290±120 SR-119 1200±95 SR-97 1170±90 SR-98	AD 646 – 857 AD 654 – 862 AD 665 – 947 AD 773 – 987 AD 779 – 1015	AD 819	2	7	6i	• Dambwa pottery: comb-stamping, multiple bands around neck of carinated pot, graphite burnish, thin- walled. Carinated bowls also occur. Larger thick-walled vessels with decoration on rim and body. • Fe arrowheads, Cu wire, Fe slag • Pits, post-hole impressed daga • Human burials without grave goods.
FIB Zambia	**Fibobe 2** Inland open-air site/farmer [61]	1450±110 NZ-4999 1200±65	AD 550 – 837 AD779 – 978	AD 819	2	7	5i	• Pottery with bangle impressed pendant loops, comb-stamped diagonal bands.

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3.3.1. S1 Table. The archaeological evidence for the appearance of livestock, pottery, metal and crops in southern Africa (Database 1).

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		NZ-5000 1175±85 NZ-5004	AD777 – 995					• Fe hoe shaft fragment, Fe razor (no information of where at the site the material derived). • Cu bangle fragment (no information of where at the site the material derived) • Pit, daga (units B, F and J), possible posts (unit F).
NQM Botswana	**Nqoma** Inland open-air site/famer [76, 199, 217]	1290±60 Beta-13257 1220±70 Beta-13256	AD 685 – 860 AD 772 – 967	AD 820	2	7	4i	• Divuyu and Xaro type pottery: small, diameters between 10cm and 16 cm, globular jars, straight sided bowls, in turned rim bowls, shouldered neck bowls, hemispherical bowls. The majority of pots have multiple bands of cross-hatch, comb-stamping, punctates or incisions. • Fe jewelry and few tools, Cu jewelry • 73 (N) sheep, 137 (N) cattle (some of which are of a humped-back variety), 2 (N) goat, 19 (N) sheep/goat (central area/society area and includes upper levels with Nqoma type pottery). • Daga • Infant burial with no grave goods, human burial with Fe and Cu jewelry and burial (Bantu-language speaker) with Nqoma style vessel, human burial (Khoisan) with stone cairn. • The site contains a pre-AD700 occupation dating possibly to AD 200 – 600 and is described by the presence of thin-walled

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								pottery similar to other sites in the area – Depression Shelter, Ancestors' Cave and Rhino cave 9 [217].
KGG South Africa	**KwaGandaganda** Inland open-air riverside site/farmer [158, 159, 160]	1260±60 Wits-1937 1245±60 Wits-1919	AD 690 – 888 AD 766 – 957	AD 825	2	7	9ii	• Ndondondwane pottery with similarities to Msuluzi pottery: narrow multiple bands of decoration on neck, less decoration on body and shoulder of pot, cross-hatching more common. • Fe beads and rods, Cu beads and earring (?), Fe slag • 62 (N) sheep, 599 (N) cattle, 22 (N) goat, 1225 (N) sheep/goat • Pits, pole-impressed daga, grain-bins, livestock byres • Upper grindstone, lower grindstone • Clay human figurines (decorated or scarification), small ceramic head
DOM Botswana	**Dombashaba** Inland hilltop site/farmer [6, 52]	1150±80 I-13746	AD 859 – 1024	-	3	8	1	• Bisoli pottery: rolled rims, parallel broad lines on neck and decoration on shoulder (origins with Bambata pottery).
MAG South Africa	**Magogo** Inland open-air riverside site/farmer [156, 157]	1190±50 Pta-2875	AD 861 – 986	-	2	8	8i	• Ndondondwane pottery • 2 (M) sheep, 28 (M) cattle, 13 (M) sheep/goat • Sorghum (?), bulrush millet, finger millet • Pits
NDD South Africa	**Ndondondwane** Inland open-air riverside site/farmer	1190±50 Pta-2389	AD 861 – 986	-	2	8	8ii	• Ndondondwane pottery with similarities to Msuluzi pottery: narrow multiple bands of decoration on neck, less decoration on body

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3.3.1. S1 Table. The archaeological evidence for the appearance of livestock, pottery, metal and crops in southern Africa (Database 1).

Site ID and country	Site Name Type of site References	Radiocarbon date Lab number	Calibration at 68.2% probability (BC or AD)	Median date	Grade of date 1 – 3	Temporal group 1 – 8	Database code 1 – 10 i-ii	List of archaeological traits
	[212; 213 214,174]							and shoulder of pot, cross-hatching more common. • Fe rolled strip, Cu bead • 459 (N) sheep, 960 (N) cattle, 47 (N) goat, 1458 (N) sheep/goat • Bulrush millet • Burnt daga floors (one possibly beehive shaped and possibly men's hut due to its location near iron working area and byre), livestock byre, furnace remains • Infant burial in pot • Upper grindstone, lower grindstone • Clay sculpted heads
MAM South Africa	**Mamba** Inland open-air riverside site/farmer [163, 164]	1170±60 Pta-4164	AD 862 – 994	-	2	8	9ii	• Ndondondwane pottery with similarities to Msuluzi pottery: narrow multiple bands of decoration on neck, less decoration on body and shoulder of pot, cross-hatching more common. • Fe slag, tuyere, Fe ore, furnace wall • 10 (M) sheep, 37 (M) cattle, 1 (M) goat, 25 (M) sheep/goat • Pit, pole-impressed daga, livestock byre • Lower grindstone with elliptical grooves • Sculptured clay heads
KZ1 Zambia	**Kazindu** Inland open-air riverside site/farmer [161]	1150±75 N-2315	AD 863 – 1023	-	3	8	6	• Early farmer pottery • Fe slag

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3.3.1. S1 Table. The archaeological evidence for the appearance of livestock, pottery, metal and crops in southern Africa (Database 1).

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EBC South Africa	**Elands Bay Cave** Coastal LSA cave site/hunter-gatherer [119, 120, 121]	1120±85 Gak-4335	AD 876 – 1127		2	8	3	• KBB/KBA style, including beveled lips, shell-edge-stamped decorations and spouts. • 1 (M) sheep
ORU Namibia	**Orunwanje 95/1** Inland LSA rock shelter/Herding [22, 23]	1194±32 UtC-5943 1178±32 UtC-5586 1172±32 UtC-5939 1120±55 KN-5299	AD 879 – 970 AD 888 – 970 AD 892 – 970 AD 895 - 1021	-	2	8	1	• Pottery with grooved horizontal and diagonal lines, incised lines, occasional cross-hatching, oblique parallel lines, black to grey to brown in colour, 6.3mm wall-thickness, fine to medium sized quartz inclusions, spout present.
NQM Botswana	**Nqoma** Inland open-air site/farmer [77, 199, 217]	1100±80 Iso-11411 1000±60 Beta-13260	AD 880 – 1127 AD 1028 – 1150	-	2	8	8i	• Nqoma type pottery: variations of pendant and interlocking triangles filled with incised or comb-stamped parallel bands or cross-hatched lines. Vessels have red ochre burnish. • Fe jewelry (few tools), Cu jewelry, tuyere, • 19 (N) sheep, 62 (N) cattle (some of which are of a humped-back variety), 6 (N) sheep/goat (faunal count does not include upper Nqoma levels from central/society area). • Sorghum • Burnt daga wall fragments with pole-impressions (shape could not be determined).
BOS **Botswana**	**Bosutswe** Inland hilltop open-air site/farmer	1230±60 (Central) TX-6997	AD 770 – 960 AD 779 – 975	AD 881	2	8	4ii	• Toutswe type pottery • Cu beads and helix

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	[40, 197, 198]	1200±60 (West) TX-6992 1170±80 (Central) TX-6982	AD 785 – 1014					• 5 (M) sheep, 52 (M) cattle, 2 (M) goat, 39 (M) sheep/goat [197]. Cattle outnumber sheep during this time period [198]. • Thatched pole and daga structures, livestock byres present
CAE Botswana	**Cae Cae (Xai-Xai)** Inland open-air pan site with farmer and pastoralist items [76, 77]	1150±60	AD 886 - 1013	-	3	8	9	• Pottery • Metal use • 1 (N) cow
SHO South Africa	**Shongweni South** Inland Cave site with a farmer occupation [218]	1170±50 Pta-1059	AD 886 – 987	-	3	8	10	• Early farmer pottery • Sorghum • Dung floor present
NBC South Africa	**Nelson Bay Cave** Coastal cave site/hunter-gatherer [15, 35, 219]	1100±80 OxA-873 **sheep AMS**	AD 888 – 1127	-	1	8	3	• Undecorated pottery • 3 (M) sheep
KSBD Namibia	**!Khuiseb Delta (Ward's Midden)** Shell midden site/hunter-herder/pastoralist [57, 107]	1170±50 KN-3598	AD 890 – 981	-	3	8	1	• The pottery comprised small globular vessels, highly burnished and bearing in some cases, elaborate decoration on the neck and rim.
GNE South Africa	**Glen Elliot** Inland rock shelter/hunter-herder [220]	1120±70 Pta-3402/75 **Fibre from pottery**	AD 890 – 1025	-	3	8	1	• Fibre tempered pottery (Class A) with some (Class B) grit temper pottery.

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3.3.1. S1 Table. The archaeological evidence for the appearance of livestock, pottery, metal and crops in southern Africa (Database 1).

Site ID and country	Site Name Type of site References	Radiocarbon date Lab number	Calibration at 68.2% probability (BC or AD)	Median date	Grade of date 1 – 3	Temporal group 1 – 8	Database code 1 – 10 i-ii	List of archaeological traits
Le6 South Africa	**Le6** Inland open-air site/farmer [138, 139, 52]	1160±50 Pta-3491	AD 891 – 1020	-	3	8	3	• Malapati Facies [52] or Gokomere/Ziwa [139]. • 14 (M) cattle, 1 (M) sheep/goat
BKK South Africa	**Blinklipkop** Inland specularite mining site/hunter-herder [53, 87]	1160±50 Pta-2840 1150±40 Pta-2835	AD 891 – 987 AD 894 – 988	-	3	8	3	• Ripple Ware: 6.3mm wall-thickness and undecorated pottery • 1 (M) sheep/goat
SCH South Africa	**Schroda** Inland open-air site/farmer [127, 221]	1160±50 Area 5 Pta-1967 1170±20 Pta-7666 1140±45 Pta-7664 1110±50 Pta-1819 1060±20 Pta-7650 1030±45 Pta-7659	AD 891 – 987 AD 893 – 970 AD 894 – 993 AD 898 – 1024 AD 995 – 1029 AD 1016 – 1145	-	2	8	8i?	• Zhizo pottery: stamped decorated ware, globular pots with everted rim with stamped decoration under the rim and/or neck. • Fe beads (all levels and areas), Fe sweat scrapers, Fe adze, Fe awl (Area 4), Fe bangles (Area 2 and 5) Fe hoe, Fe adze (Area 5), Cu beads, Cu ferrule, Cu spiral, Fe slag (surface), tuyere. Total livestock at site: • 201 (M) cattle, 263 sheep/goat. • Possible charred sorghum (Areas 5 and 6) • 2 Pits (Area 2), burnt daga, post-holes, circular/oval hut floor, stone-walling (Area 2) Total human burials at site: • 5: human burial without grave goods, human burial with grave goods • Upper grindstones/hammerstones, lower grindstone with elongated hollow (Area 6),

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3.3.1. S1 Table. The archaeological evidence for the appearance of livestock, pottery, metal and crops in southern Africa (Database 1).

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								complete grindstone with hut remains (Area 2). • Cattle clay figurines, sculpted female figurines, sculpted human figurines with scarification and/or elongated, numerous sculpted clay fragments recovered from the site including birds and giraffe.
KAB Zambia	**Kabondo Kumbo** Inland open-air river site/farmer [134]	1240±65 N-1922 1160±85 N-1920 1150±85 N-1919	AD 766 – 964 AD 785 – 1020 AD 790 – 1024	AD 892	2	8	6i	• Kamangoza, Dambwa and Kumadzulo type pottery • Fe hoes, Fe arrowheads, Fe spearheads, small Fe axe, Fe knives, Fe bodkins, Fe razors, FE bracelet, Cu bangles, Fe slag, tuyere • Pits (one pit with bottomless pot), pole-impressed daga, hut-floor (sub-rectangular. • Clay cattle figurine (?)
NTKE South Africa	**Ntshekane** Inland open-air riverside site/farmer [222]	1150±45 Pta-1058 1100±50 Pta-1057	AD 893 – 989 AD 899 – 1028	-	2	8	9i	• Ntshekane type pottery: tall necked vessels and mostly open-mouthed bowls. Bowls are generally undecorated. Burnishing occurs (red ochre, graphite and black). Continuous bands of decoration around the neck of vessels with parallel grooves or incision. Sometimes pendent shaped decoration on body of pot. • Fe slag, tuyere, Fe ore (?) • 20 (M) sheep, 14 (M) cattle • Pits, pole-impressed daga, hut floor (dimension could not be identified) • Upper grindstones, lower grindstones (long oval grooves)

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3.3.1. S1 Table. The archaeological evidence for the appearance of livestock, pottery, metal and crops in southern Africa (Database 1).

Site ID and country	Site Name Type of site References	Radiocarbon date Lab number	Calibration at 68.2% probability (BC or AD)	Median date	Grade of date 1 – 3	Temporal group 1 – 8	Database code 1 – 10 i-ii	List of archaeological traits
								• Clay cattle figurine
OBP South Africa	**Olieboomspoort** Inland LSA rock shelter/Hunter-gatherer [32]	1140±40 Pta-7416	AD 895 – 992	-	2/3	8	3?	• Bambata A pottery: thin-walled, jars, spout and bosses, grey to black with red slip, comb-stamped and incision, ripple rims. Happy Rest, Eiland, Broedhurst and Icon/Moloko pottery were found in the same stratigraphic levels as Bambata A pottery at different frequencies. • sheep/goat are present but only in more recent occupation levels.
TAF Zimbabwe	**Tafuna Hill** Inland mining site/farmer [223, 224]	1070±105 N-1148	AD 895 – 1150	-	3	8	6i	• Coronation type pottery • Fe razor, Fe blade, Fe slag, tuyere • Pole-impressed daga (no structure identified)
THD Zambia	**Thandwe** Inland LSA rock shelter with farmer pottery [100]	1060±110 N-906	AD 896 – 1155	-	3	8	1	• Early farmer pottery
LRY Zimbabwe	**Lanlory** Inland open-air site/farmer [225, 226]	1130±50 Pta-606	AD 896 – 1016	-	3	8	6i	• Early farmer pottery similar to Kapwirimbwe in Zambia • Fe bangle, Cu bangle, Fe slag, tuyere • Pole-impressed daga • Human burial with grave good, human burial with dental alteration.
KAP Namibia	**Kapako** Inland open-air surface site/Iron working groups	1110±50 Pta-234	AD 898 – 1024	-	3	8	6i	• Pottery is brittle and 10 mm thick. A large necked bowl is present with a thickened lip. Decoration consists of a broad band of

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	[99, 227]							incised horizontal lines, herringbone, cross-hatching or a combination of these elements. • Fe ring and point, Fe slag • Pits
TOT3 Botswana	**Toteng 3** Inland open-air site/hunter-herder/pastoralist [6, 25, 26, 27]	1130±40 Beta-186671 **sheep AMS**	AD 897 – 1014	-	1	8	2	• sheep
LE 7 South Africa	**Le7a** Inland open-air site/farmer [138, 139, 52]	1120±50 Pta-3478	AD 897 – 1020	-	3	8	3	• Malapati ware [52] or Eiland/Matola [138, 139] • 12 (M) cattle, 3 (M) sheep/goat
PTD South Africa	**Pont Drift** Inland open-air site/farmer [52]	1110±50 Pta-1961	AD 898 – 1024	-	3	8	3	• Zhizo pottery characterized with the appearance of beakers, graphite burnish on bowls (some red haematite used on vessels). Similar to Gokomere pottery. • 59 (M) cattle, 119 (M) sheep/goat
KBB South Africa	**Kasteelberg B** Coastal boulder site/hunter-herder/Pastoralist [36, 44, 45, 46, 47, 48]	1100±50 Pta-5083 990±35 Pta-4500	AD 899 – 928 AD 1036 – 1147	-	2	8	3	• (1) Shell-stamped pottery with spouts with some lugs, 6mm, jars (Cape coastal pottery), (2) undecorated, lugged pottery. Total livestock at site: • 138 (M) sheep, 7 (M) cattle • Grooved (boat-shaped) grindstones
DOF	**Doornfontein** Inland cave site (ancient working site)/pastoralists [35, 228]	1120±40 Pta-186	AD 900 – 1018	-	3	8	1	• Doornfontein type pottery: thin-walled with horizontally pierced lugs (some Iron Age pottery found).

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3.3.1. S1 Table. The archaeological evidence for the appearance of livestock, pottery, metal and crops in southern Africa (Database 1).

Site ID and country	Site Name Type of site References	Radiocarbon date Lab number	Calibration at 68.2% probability (BC or AD)	Median date	Grade of date 1 – 3	Temporal group 1 – 8	Database code 1 – 10 i-ii	List of archaeological traits
NAMB Malawi	**Namaso Bay** Open-air site/farmer [110]	1075±75 GX-14813	AD 900 – 1140	-	2	8	5i	• Namaso pottery: sub-spherical bowls with slightly constricted mouths, open hemispherical bowls both highly decorated with single line-impressions or comb-stamp near rim or towards shoulder in a mostly crisscross (stich) motif**.** • Fe corroded strip, Cu spirally wound wire • Post-hole daga • Upper grindstone, lower grindstone with oval groove mark
KGG South Africa	**KwaGandaganda** Inland open-air riverside site/farmer [158, 159, 160]	1080±60 Wits-1920	AD 900 – 1130	-	2	8	9i	• Ntshekane pottery • Fe slag, tuyere • 18 (N) cattle, 37 (N) sheep/goat • Pits (bottomless pot present in pit), daga, pole-impressed daga, hut floors (roughly encircled around a central area). • Lower grindstones
BES Namibia	**Big Elephant Shelter** Inland LSA rock shelter/hunter-gatherer [149, 150]	1080±50 Pta-1558	AD 901 – 1105	-	3	8	3	• Undecorated pottery, one decorated with two vertical lines of horizontal nail impressions (similar to Dama or Nama pottery), one spout present. • 4 (M) sheep, 1 (M) c.f. cattle
CHD Zambia	**Chondwe** Inland open-air site/farmer [115, 207, 229]	1060±95 GX-1010	AD 903 – 1150	-	2	8	6i	• Chondwe Group: the lower levels yielded potsherds of Early Iron Age type characterized by thick fabric, gritty or sandy paste, and thickened or undifferentiated rims. The most frequent decorative motifs are lines of false-relief chevron stamping and designs composed of segmental blocks of comb-

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								stamping delineated by broad grooves. A limited number of incised designs also occur. Undecorated vessels are rare. Two sherds with applied bosses. • Fe bead, Cu strips, Fe slag, tuyere • Daga (no pole-impressions identified or hut floors) • Lower grindstone with lenticular grooves (surface find). • Chipped quartz artefacts of LSA type recovered.
KLD Zambia	**Kalundo Mound** Inland open-air mound site/farmer [17]	1050±100 SR-66	AD 904 – 1156	-	2	8	8i?	• Kalundu Tradition pottery: multiple band decoration on neck, shouldered vessels, thin-walled, globular shaped pots; bowls, thick-walled, spouts, lugs and bosses are present (but not numerous), burnishing present (mostly graphite around necked pots and bowls), comb-stamping common feature of decoration, increase in bag-shaped pots with increase in livestock at site. • Fe strip, Cu bracelet, Fe slag (small amount), tuyere (1 piece), bellow nozzles Total livestock at site: • 3(N) cattle; sheep/goat (number not provided) • Pits, daga (no identifiable floor), grain-bin (?) • Human burials with no grave goods • Clay humped cattle figurines

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LUB Zambia	**Lubusi** Inland open-air site/farmer [100]	1070±60 SR-216	AD 909 – 1139	-	3	8	6	• Early farmer pottery (similar to some Angolan ceramic assemblages) • Fe working
CHB Mozambique	**Chibuene** Coastal trading station/farmer [202, 203, 204]	1180±50 R-1325 1155±85 St-8496 1080±80 St-8495	AD 876 – 989 AD 891 – 989 AD 896 – 1140	AD 964	2	8	3	• (1) Matola type pottery and (2) Triangular Incised Ware (origins from East African coast) • 1 (N) sheep, 6 (N) cattle, 3 (N) goat, 8 (N) sheep/goat • The Matola classified pottery does not correlate with the radiocarbon dates.
CHO Zambia	**Chowo River** Inland open-air site/farmer [96]	1010±130 Beta-182955	AD 974 – 1216	-	3	8	10	• Early farming pottery • Sorghum
RVS South Africa	**Riverside** Inland open-air site/farmer [129, 52]	1070±40 Pta-7670	AD 981 – 1127	-	2	8	3ii	• Klingbeil type pottery • Cattle present • Pits, livestock byre
OVI Namibia	**Ovizorombuku 96/1** Inland LSA rock shelter [23]	1070±35 KN-5184 1042±33 UtC-8103	AD 986 – 1040 AD 995 – 1131	-	2	8	1	• Pottery with 5.5mm thick-walls, quartz grit, well fired; some burnished sherds (ochre and black), incised horizontal and/or oblique lines, some cross-hatching and one sherd with herringbone-like motif and another with possible finger-nail impressions.
KMG Zambia	**Kamangoza** Inland open-air site/farmer [196]	1015±105 N-419 1040±105	AD 987 – 1185 AD 908 – 1176	-	3	8	5i	• Kamangoza pottery showing affiliation to Kalundu, Dambwa and Kumadzulo ware.

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		N-421 975±105 N-457 940±105 N-423 900±105 N-426 900±105 N-424 870±105 N-425	AD 1023 – 1207 AD 1035 – 1218 AD 1046 – 1271 AD 1046 – 1271 AD 1048 – 1285					• Fe arrowheads, Fe knife, Fe chisel, Fe razor, Fe bodkin, Fe needle, Cu wire, Cu bangle frag; Cu ring (?) • Pits, traces of hut floors
ZYF South Africa	**Zaayfontein** Inland rock shelter/hunter-herder [220]	1050±60 Pta-3393 **Fibre from pottery**	AD 988 – 1145	-	3	8	1	• Fibre tempered pottery (Class A) with some (Class B) grit temper pottery
DSM South Africa	**Drie Susters Main** Coastal shell midden site/pastoralist [121]	1050±60 Pta-5478	AD 988 – 1145	-	3	8	3	• Undecorated and lugged pottery • 2 (M) cattle, 1 (M) sheep/goat
KAB Zambia	**Kabondo Kumbo** Inland open-air river site/farmer [134]	1020±95 N-1917	AD 990 – 1175	-	2	8	6i	• Shongwe pottery • Fe hoes, Fe slag, tuyere • Post-hole impressed daga, hut floor • Clay cattle figurine, clay human figurine.
KNO Namibia	**Kanono Mulapo** Dune shell midden site with farmer pottery/hunter-gatherer [201]	1050±20 Pta-8647 **Charcoal extracted from pottery**	AD 995 – 1035	-	1	8	1	Total at site: • Kalomo pottery showing similarities to Kalundu and Gundu (Naviundu from Congo (western origin) is an ancestor to Gundu pottery [117] Total at site: 5 vessels with comb-stamping on the rims and band of

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								triangular impressions. Some incised motifs are present. The pottery was associated with shell.
ZMF Zambia	**Zambezi Farm** Open-air site/farmer [182]	910±160 N-1143	AD 1020 – 1285	-	3	8	4i	• Pottery similar to Kamangoza, Dambwa and Kumadzulo ware. • Fe hoe, Fe bangle, Fe arrowheads, Fe bodkins, Fe chisel, Cu strip and wire • Cattle (count not provided) • Pits, post-holes with daga (no floors but suggested to be sub-rectangular in shape).
AB3 South Africa	**Atlantic Beach 1** Coastal shell midden site/herder [86]	1490±50 Pta-8797 Shell (not corrected)	AD 1026 – 1122 Shell corrected	-	3	8	3	• Spouted ware • 2 (M) sheep
URU Namibia	**Ururu** Inland LSA rock shelter [18; 170]	1000±60 Pta-2664	AD 1028 – 1150	-	3	8	1	• Undescribed pottery
GUN Zambia	**Gundu** Inland open-air mound site/farmer [117]	965±100 N-428	AD 1029 – 1204	-	3	8	1i	• Kamangoza type pottery showing affiliation to Kalundu, Dambwa and Kumadzulo ware • Pit, hut floor
ISP Zambia	**Isamu Pati** Inland open-air mound site/farmer [17]	910±90 SR-31 890±50 UCLA-176 910±90 SR-80 960±70	AD 1046 – 1265 AD 1154 – 1263 AD 1046 – 1265 AD 1041 – 1181	-	2	8	9i	• Kalomo pottery showing similarities to Kalundu and Gundu (Naviundu from Congo (western origin) is an ancestor to Gundu pottery [117] • Fe arrowheads, Fe spearheads, Fe bangle, 1 small Fe ho, Cu bangles, Fe slag, tuyere • 1 (N) cattle, 29 (N) sheep/goat

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		UCLA-177 995±61 R874	AD 1030 – 1150					• Sorghum • Pits, pole-impressed daga, hut floor • Human burials with some grave goods (Fe bangle, Cu anklet and pottery), one human burial with dental alteration. • Upper grindstone, lower grindstone • 33 cattle figurines found at the site.
KBA South Africa	**Kasteelberg A** Coastal boulder site/hunter-herder/Pastoralist [36, 44, 45, 46, 47, 48]	970±50 Pta-4336	AD 1043 – 1158	-	2	8	3	• Undecorated, lugged pottery Total livestock at site: • 34 (M) sheep, 2 (M) cattle (mostly in the upper levels)
KFB outh Africa	**Kreeftebaai** Coastal shell midden [44, 120]	970±50 Pta-5517	AD 1043 – 1158		3	8	1	• Undecorated, lugged pottery
KN15 South Africa	**KN2004/015E** Coastal deflated scatter [39]	973±24 OxA-22930	AD 1045 – 1155	-	3	8	1	• Pottery with relatively thin-walls (5.76mm), vertical necked vessels
NPL Zambia	**Nakapapula Rockshelter** Inland LSA rock shelter with farmer pottery [230]	910±85 GX-767	AD 1046 – 1265	-	3	8	1	• Kalambo type pottery
TWK Zambia	**Twickenham Road** Inland open-air site/farmer [231]	895±110 GX-662	AD 1046 – 1274 ¤	-	3	8	9i	• Early farmer pottery similar to Kapwirimbe • Fe slag • 1 (M) goat horn • Pit

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								• Lower grindstone
CHI Malawi	**Chia Lagoon** Open-air site/farmer [232]	935±50 Pta-2147	AD 1047 – 1215	-	3	8	1	• Nkope pottery
BLY South Africa	**Blydefontein** Inland large rockshelter/hunter–herder [62, 63, 64, 65, 66, 67, 68]	844±119 SMU-1902	AD 1048 – 1375	-	2	8	1	• Khoe pottery
NDN Zambia	**Ndonde** Inland open-air mound site/farmer [117]	870±105 N-433	AD 1048 – 1285	-	3	8	1i	• Kangila type pottery: straight necked bowls with round bodies and globular necked pots with a band of decoration (mostly incised or comb-stamped, some graphite burnish, lugs and spouts are present but rare. • Pits, daga, hut floor • Upper grindstone, lower grindstone
AUS Namibia	**Austerlitz** Inland surface site [18]	910±55 KN-I635	AD 1050 – 1228	-	3	8	1	• No description of pottery
BJP South Africa	**Biesje Poort** Inland open-air site/herder [74, 94, 109]	930±40 Pta-9506	AD 1051 – 1214	-	2	8	1	• Pottery assemblage found with two spout fragments, two decorated with incised lines and row of punctates. Burnished sherds, some grass tempering, relatively thin-walled (5.3mm)

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3.3.1. S1 Table. The archaeological evidence for the appearance of livestock, pottery, metal and crops in southern Africa (Database 1).

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3.3.1. S1 Table. The archaeological evidence for the appearance of livestock, pottery, metal and crops in southern Africa (Database 1).

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3.3.1. S1 Table. The archaeological evidence for the appearance of livestock, pottery, metal and crops in southern Africa (Database 1).

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Appendix 3

3.3.2. S2 Table. Southern African publication count for research on farming and pastoralism for the period 1950 to 2016 (Database 2).

Country	Geographic site	Latitude	Longitude	Number of publications
Angola	Berorue Mountains	-16,94514444	12,70805833	1
Angola	Humpata Highlands	-15,03059722	13,37787778	2
Angola	Quibaxe	-8,587988889	13,65583056	3
Angola	Capanda	-9,797519444	15,47024722	3
Angola	M'banza-Kongo	-6,271369444	14,23343889	2
Angola	Soyo	-6,149297222	12,35454444	1
Angola	Benfica	-9,093230556	13,12819722	3
Angola	Kitala	-9,287341667	13,15229167	1
Angola	Ebo	-10,93861389	14,70603333	2
Angola	Huila Province	-14,914	13,49940278	1
Angola	Tchitundo-hulo	-15,96036389	12,88129444	3
Angola	Praia dos Conchas	-15,12086389	12,12026667	1
Angola	Baia Azul	-12,62025278	13,25797778	2
Angola	Palmerinhas	-9,176433333	13,05418056	2
Angola	Liavela	-15,17759722	17,65518889	1
Angola	Lilunga	-15,81858889	17,571675	1
Angola	Ganda	-13,07098333	14,63088611	1
Botswana	Tsodilo Hills	-18,75846389	21,72843333	31
Botswana	Tuli	-22,29871944	28,98694444	7
Botswana	Bosutswe	-24,6317	26,11311389	11
Botswana	Sowa Pan	-20,563825	26,17773056	3
Botswana	Serowe	-22,40474722	26,70564444	3
Botswana	Francistown and surrounding areas	-21,17402222	27,51263333	5
Botswana	Makgadikgadi Saltpans	-20,7978	25,47335556	12
Botswana	Letsibogo Dam	-21,84585278	27,72003056	2
Botswana	Kgaswe	-22,53095278	27,04002222	1
Botswana	Kangwa Valley and Dobe	-19,98535	21,03041667	10
Botswana	Cae Cae	-19,98535	21,03041667	8
Botswana	Kgatleng	-24,22011667	26,23046111	7
Botswana	Motsenekatse	-25,16951389	25,57463889	2
Botswana	Gaborone and surrounding areas	-24,65795278	25,91031944	9
Botswana	Lake Ngami	-20,46201389	22,79807778	15
Botswana	Okavango region	-19,28818611	22,91225833	19
Botswana	Thamaga	-24,66725278	25,53286667	4
Botswana	Matsieng	-24,35986944	26,09626111	1
Botswana	Kwihabe Hills	-20,03333333	21,41666667	1
Botswana	Tati region	-21,20424722	27,53516667	2
Botswana	Thatswane Hill	-22,42081111	26,7627	1
Botswana	Okwa Valley	-22,34578611	22,14559167	1
Botswana	Ghanzi	-21,691975	21,64847778	2
Botswana	Makalamabedi Drift	-20,25833333	23,85277778	2
Botswana	Gi	-19,01666667	21,01666667	2
Botswana	Ntsweng (Molepolole)	-24,41241389	25,56448333	6
Botswana	Phalatswe	-22,49547778	27,94832778	2
Botswana	Taukome	-24,65566389	25,867875	1
Botswana	Savuti Pan	-18,56823056	24,06705556	1
Botswana	Kudiakam Pan	-20,12928611	24,76761389	1
Botswana	Toutswe	-22,23275278	27,19918889	14
Botswana	Modipe Hill	-24,64083333	26,1575	1
Botswana	Bobonong	-22,14505	28,69016111	6
Botswana	Tswapong Hill	-22,65271389	27,51665833	2
Botswana	Palapye	-22,55241944	27,11478056	2
Botswana	Ranaka	-24,93985278	25,45485833	1
Botswana	Boteti	-20,948725	24,71674444	2

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3.3.2. S2 Table. Southern African publication count for research on farming and pastoralism for the period 1950 to 2016 (Database 2).

Country	Geographic site	Latitude	Longitude	Number of publications
Botswana	Taukome	-22,24930278	26,72413333	3
Botswana	Shoshong	-23,04218056	26,50385833	2
Botswana	Mahalapye	-23,13173611	26,83479444	1
Botswana	LSA site map by Walker	-21,37435278	22,25813611	1
Botswana	Domboshaba	-20,6	27,36666667	4
Botswana	Mokgware	-22,73071111	26,62070278	2
Lesotho	Near Thaba Tseka	-29,46666667	28,45	1
Lesotho	Area near Maseru	-29,46666667	27,6	5
Lesotho	Qacha's Neck region	-30,06666667	28,4	3
Lesotho	Tabalo district	-29,76666667	28,78333333	19
Lesotho	Butha-Buthe District	-28,76767778	28,24928611	1
Lesotho	Moyeni, Quthing District	-30,435475	27,69551389	1
Lesotho	Metolong Dam	-29,34053611	27,77725833	2
Lesotho	Sehlabathebe National Park	-29,90368333	29,11688333	4
Malawi	Chencherere	-14,29323611	34,24780556	6
Malawi	Banda Hill (Dedza District)	-14,35031389	34,283275	1
Malawi	Chongoni Mountain (Dedza District)	-14,22631389	34,19766667	3
Malawi	Chongoni Hill (Dedza District)	-14,21398333	34,17139722	1
Malawi	Ntambala Hill (Dedza District)	-14,03891389	34,21657778	1
Malawi	Mphata-Milonde (Dedza District)	-14,16720278	34,21654722	1
Malawi	Dedza District site location	-14,21738889	34,00489167	1
Malawi	Dedza District site location 2	-14,24815833	34,39421944	1
Malawi	Namaso Bay area	-14,17386667	34,98025	1
Malawi	northern Rukuru survey area (Northern Malawi) central locator point	-10,04376111	33,68911944	3
Malawi	Rumphi District	-11,12781667	33,65842222	3
Malawi	Chombe (Northern Malawi) near Livingstonia	-10,75239167	34,18332778	1
Malawi	Nyika National Park	-10,80219722	33,79956111	3
Malawi	Karonga (Northern Malawi)	-9,957205556	33,92497778	6
Malawi	Chilumba (Northern Malawi)	-10,43898889	34,24470556	1
Malawi	Hora Mountain area (Mzimba) Northern Malawi	-11,66666667	33,65	3
Malawi	Tanti Mountain area (Mzimba) Northern Malawi	-11,66666667	33,71666667	2
Malawi	Old Tambuka (near Nyika National Park)	-11,06666667	33,75	1
Malawi	Livingstonia (Northern Malawi) Manchere Falls area	-10,614725	34,10829167	2
Malawi	Lumbule Hills (Northern Malawi)	-10,1062	33,91350278	1
Malawi	Chisavya's Village (Nyika National Park)	-10,88333333	33,83333333	1
Malawi	Rukwerero Hill (Nyika National Park)	-10,65	33,81666667	1
Malawi	Salima (Central Malawi)	-13,71186389	34,43082222	1
Malawi	Mankhama (Central Malawi) near the Dedza District	-14,2	34,5	3
Malawi	Nkhudzi Bay (Lake Malawi)	-14,18372778	35,00617222	4
Malawi	Mangochi District (Southern Lake Malawi) (Mtemankhokwe)	-14,49794444	35,17699722	3
Malawi	Nkope Bay (Southern Lake Malawi)	-14,20023333	35,03263333	3
Malawi	Mawudzu Hill (Southern Lake Malawi)	-14,25	35,08333333	2
Malawi	Machisi Village (Southern Lake Malawi)	-14,33333333	35,15	2
Malawi	Schrire Uplands area (Southern Malawi) central locator point	-15,79898611	35,16909167	5
Malawi	Zomba Range central locator point	-15,42718889	35,34592778	1

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3.3.2. S2 Table. Southern African publication count for research on farming and pastoralism for the period 1950 to 2016 (Database 2).

Country	Geographic site	Latitude	Longitude	Number of publications
Malawi	Cape Maclear (Southern Lake Malawi)	-14,02089444	34,85081944	1
Malawi	Linthipe (Dedza District) Central Malawi	-14,18550556	34,12578056	2
Malawi	Kasungu Area (Central Malawi)	-13,07484722	33,48073889	1
Malawi	Fingura (Central Malawi)	-11,51259167	33,64583889	2
Malawi	Mtuzi (Dedza District)	-14,31292778	34,33899167	1
Malawi	Pwadze (Southern Malawi)	-16,00970556	34,56287222	1
Malawi	Mulanje Plateau area (Southern Malawi)	-15,94639167	35,52388056	1
Malawi	Nkhotakota Lake Shore area (Central Malawi)	-12,93901667	34,28174444	1
Malawi	Upper and Lower Schrire River Survey central locator point	-15,22688333	35,10821389	1
Malawi	Kafyenyenyo (near Livingstonia) Central/Northern Province	-10,53333333	34,15	1
Malawi	Guwuwuwu (near Livingstonia) Central/Northern Province	-10,58333333	34,11666667	1
Mozambique	Maniamba (Niassa Province) central locator point for survey	-12,76094722	34,98176944	1
Mozambique	Vilankulos Region (Inhambane Province) (Chibuene site)	-21,99972778	35,31920278	9
Mozambique	Massingir District (Gaza Province)	-23,99357222	32,17453889	4
Mozambique	Querimba Archipelago (Cabo Delgado Province)	-11,64148333	40,6263	1
Mozambique	Manyikeni site, near Muabsa (Inhambane Province)	-22,23333333	34,80833333	9
Mozambique	Bazaruto Island	-21,64985833	35,46738889	1
Mozambique	Hola Hola (Part of Save River Survey	-21,29166667	34,28333333	4
Mozambique	Mavita (Manica Province)	-19,53333333	33,13333333	1
Mozambique	Matola (Maputo area)	-25,95	32,43333333	8
Mozambique	University Campus (Maptuto area)	-25,95	32,6	6
Mozambique	Xai Xai District (Gaza Province)	-25,11666667	33,71666667	1
Mozambique	Praia du Bilene (Gaza Province)	-25,31666667	33,23333333	1
Mozambique	Changalane District (Caimane)	-26,29497222	32,19536944	4
Mozambique	Zitundo (Maputo Province)	-26,73333333	32,81666667	5
Mozambique	Chongoene District (Gaza Province)	-25,08333333	33,81666667	1
Mozambique	Nampula Province (central locator point)	-14,96666667	39,75	5
Mozambique	Riane Rockshelter	-13,73333333	40,15	2
Mozambique	Melassane Shelter	-14,87397222	38,28616111	1
Mozambique	Limpopo National Park (Mozambique) central locator point	-23,09434167	32,21737778	1
Mozambique	Zumbo District (Tete Province) Mutapa State site	-15,61153611	30,44101667	1
Mozambique	Songo (Tete Province)	-15,60277222	32,75181944	3
Mozambique	Zembe District (Manica Province)	-19,26138611	33,348075	1
Mozambique	Manica District (Manica Province)	-18,93443889	32,87556944	1
Mozambique	Macossa (Manica Province)	-17,89954167	33,933375	1
Mozambique	Molelele (Tete Province) approximate	-14,79144722	33,12721944	1
Mozambique	Benga (Tete Province)	-16,192975	33,63175	2
Mozambique	Changara (Tete Province)	-16,82885833	33,27820278	1
Mozambique	Mungari (Manica Province)	-17,367475	33,45841944	1
Mozambique	Machire (Manica Province)	-20,06719167	33,2503	1
Mozambique	Inhaca Island	-26,02445	32,95503611	1
Mozambique	Pont de Ouro	-26,842675	32,88598333	1
Mozambique	Mozambique Island	-15,03656389	40,73241944	1
Mozambique	Quirimba (Cabo Delgado Province)(Swahili)	-12,60972222	40,60972222	2

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3.3.2. S2 Table. Southern African publication count for research on farming and pastoralism for the period 1950 to 2016 (Database 2).

Country	Geographic site	Latitude	Longitude	Number of publications
Mozambique	Matemwe Island (Cabo Delgado Province) (Swahili)	-12,19888889	40,565	1
Mozambique	Namuno District (Cabo Delgado)	-13,7856	38,82324722	1
Mozambique	Matela (Cabo Delgado)	-13,09694444	39,03166667	1
Mozambique	Mecufi District (Cabo Delgado)	-13,21769167	40,43128333	1
Mozambique	Lurio District (Cabo Delgado)	-13,53075278	40,50365278	2
Mozambique	Angoche Island (Nampula Province)	-16,21520833	39,91428611	4
Mozambique	Nova Sofala (Sofala Province)	-20,02436111	34,74269722	1
Mozambique	Lower Zambezi River (central locator point)	-18,48204722	36,05008056	1
Mozambique	Gurue District (Zambezi Province)	-15,52875833	36,99618333	1
Mozambique	area between Xai Xai and Chongoene Districts central locator point	-25,098	33,76388889	1
Namibia	Sikeretti District, Kaudom Reserve (Cho/ana)	-19,10213889	20,70558611	2
Namibia	Otjiwarongo District (Waterberg Mountains) ethnoarchaeology	-20,45487222	16,66444167	2
Namibia	Kuidas Spring (Kunene Region)	-20,63047778	13,84598056	2
Namibia	Kavango Survey area central locator point	-18,15326667	20,06879167	7
Namibia	Hoanib River (Kunene Region)	-19,28789722	13,29312778	1
Namibia	Karibib District (Erongo Region)	-21,93825833	15,86297778	1
Namibia	Brandburg	-21,13360556	14,58489722	21
Namibia	Hungorob Ravine, Erongo Region (Kinahan)	-21,20024722	14,51669722	10
Namibia	!Khuiseb Delta (Kinahan)	-23,22797222	15,62437222	14
Namibia	Windhoek (Khomas Region)	-22,56392222	17,06693056	5
Namibia	Walvis Bay, Sandwich Bay (Erongo Region)	-22,94136111	14,52658889	6
Namibia	Rehoboth (Hardap Region)	-23,32554444	17,09173333	2
Namibia	Meob Bay	-24,516725	14,60835278	1
Namibia	Mariental District (Hardap Region)	-24,60051111	17,94121389	2
Namibia	Maltehohe District (Hardap Region)	-24,83869722	16,98026389	1
Namibia	Bethanien (Bethanie) (Karas Region)	-26,51175	17,15161944	2
Namibia	Chemeis (Chemeis Bay)	-27,85101667	15,73666667	1
Namibia	Outjo District (Geduld) (Kunene Region)	-20,11861944	16,16050556	6
Namibia	Luderitz to Orange River coastal strip central locator point	-27,58931111	15,99439444	2
Namibia	Tsaraxaibis (Kara Region)	-27,41833333	19,38625278	1
Namibia	Koichab River area central locator point (Noli)	-26,25528889	15,56983889	1
Namibia	Orupembe Study area (Himba and Herero) ethnoarchaeology	-18,17196389	12,56550833	1
Namibia	Awasib Region	-25,52980556	15,64700833	3
Namibia	Masari region (Kavango Region) approximate	-18,18155556	21,50787222	1
Namibia	Linyanti and Liambezi survey (Kinahan) Caprivi region central locator point	-17,97653333	24,05794167	1
Namibia	Skorpion Cave	-27,88333333	16,63333333	1
Namibia	Twyfelfontein	-20,59755833	14,37375833	1
Namibia	Hunsberge area (Apollo Cave) Nuob River	-27,84160833	17,16567222	2
Namibia	Epupa Falls area central locator point (Kunene Region)	-17,00115278	13,24359444	3

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3.3.2. S2 Table. Southern African publication count for research on farming and pastoralism for the period 1950 to 2016 (Database 2).

Country	Geographic site	Latitude	Longitude	Number of publications
Namibia	Ehomba area central locator point (Kunene Region)	-17,49098056	13,83113333	1
Namibia	Opuwo area central locator point (Kunene Region)	-17,91876111	13,82695	1
Namibia	Kaoko Otavi central locator point (Kunene Region)	-18,301625	13,65301111	4
Namibia	Hoarusib River and Orupembe survey central locator point (Kunene Region)	-18,44617222	12,37512778	1
Namibia	Survey area 6 in the Kunene Region (under the Mopane Tree) (Kunene Region)	-17,77773056	12,273575	1
Namibia	Survey area 7 in the Kunene Region (under the Mopane tree)	-17,46834167	12,22051111	1
Namibia	Makuri area, Omeheke Region	-19,65886667	20,71016667	1
Namibia	Epata, Omeheke region	-21,07548333	18,86586667	1
Namibia	Otjineene, Omeheke region	-21,13762778	18,78682778	1
Namibia	Otjumunguindi, Omeheke region	-20,622925	20,04444722	1
Namibia	Nyae Nyae	-19,73116944	20,46518333	3
Namibia	Cape Fraia (Kunene Region)	-18,45011111	12,016725	1
Namibia	Naukluft, Hardap Region	-24,26521667	16,24298611	2
Namibia	Fish River Canyon central locator point (Kara Region)	-27,77991111	17,57889444	1
Namibia	near Oryokawe	-16,98449167	13,058675	1
Namibia	Lower Kunene River survey (Kinahan) Kunene Region	-17,09056111	13,36468056	1
Namibia	Lower Kunene River survey area 2 (Kinahan) Kunene Region	-17,16555833	13,53055833	1
Namibia	Stampriet, Hardap Region	-24,343625	18,40239722	1
Namibia	Cape Cross	-21,78248333	14,00439167	1
Namibia	Omaruru District, Erongo Region	-21,42121111	15,95251111	1
Namibia	Spitzkoppe, Erong Region (Rhino Cave)	-21,88333333	15,19235556	2
Namibia	Otjitati, Kaokoland (Kunene Region)	-18,01700833	12,66665556	1
Namibia	Sylvia Hill, Karas Region	-25,14924722	14,85459444	1
Namibia	#hing-/hais (Gobabeb District) Erongo Region	-23,57326389	15,04279722	1
Namibia	Steenbras Bay	-22,11931667	14,27981389	2
Namibia	Rosh Pinah, Kakas Region	-27,96819167	16,76216667	1
Namibia	Luderitz	-26,47884167	15,16398056	2
Namibia	Big Elephant and Striped Giraffe, Phillips Cave, Leopard Cave(Erongo Region)	-21,68333333	15,66666667	7
Namibia	Zerrisene Mountains (near Brandburg), central locator point	-21,19381944	14,20709722	4
Namibia	Mirabib Hill	-23,45	15,31666667	2
Namibia	Mount Uri-Hauchab	-25,35937778	15,17293889	1
Namibia	Hasenbild and Ururu (Wendt) near Kuidas Spring	-20,58333333	14,05	1
Namibia	Messum	-21,36666667	14,28333333	2
Namibia	Etemba	-21,45	15,65	1
South Africa	Sibudu Cave (Tongati River)	-29,58725556	31,08522222	9
South Africa	Waterberg (Limpopo Basin)	-24,16598889	28,14679722	11
South Africa	Burgersfort	-24,77495556	30,35073889	1
South Africa	Kruger National Park (south)	-24,76084444	31,80646667	7
South Africa	Kruger National Park (north/central) (Letaba)	-24,072925	31,56955	12

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3.3.2. S2 Table. Southern African publication count for research on farming and pastoralism for the period 1950 to 2016 (Database 2).

Country	Geographic site	Latitude	Longitude	Number of publications
South Africa	Phalaborwa (Limpopo Basin)	-23,96664444	31,14484722	12
South Africa	Mapungubwe area	-22,20788056	29,37028889	50
South Africa	Southern Highveld Area (Magg's survey and excavated area)	-28,64131944	27,11642778	4
South Africa	Soutpansberg (Limpopo Basin)	-23,014425	29,76828333	10
South Africa	Winburg (southern Highveld)	-28,52670833	27,02050833	5
South Africa	Makapan area (Limpopo Basin)	-24,27281944	28,97604444	8
South Africa	uMgungundlovu (northern KwaZuluNatal)	-28,70378611	31,86358611	2
South Africa	Thabazimbi (Limpopo Basin)	-24,66371389	27,43692222	4
South Africa	Bergville Area (Mgoduyanuka, KwaZulu-Natal)	-28,71666667	29,39444444	7
South Africa	Steelport Area	-24,82123889	30,16950556	2
South Africa	Lower Thukela Basin (NDD, KwaZulu-Natal)	-28,895	31,03111111	23
South Africa	Madikwe Reserve	-24,768575	26,27815	2
South Africa	Shashe Limpopo Confluence area (Balerno Main)	-23,6176	28,90634167	29
South Africa	Richards Bay area (KwaZulu-Natal)	-28,78444444	32,03821667	3
South Africa	Balito Bay area (KwaZulu-Natal)	-29,53921389	31,07365556	2
South Africa	Mhlanga (KwaZulu-Natal)	-29,74094444	31,07365556	2
South Africa	Doonside (KwaZulu-Natal)	-30,07188056	30,86856111	1
South Africa	Mngeni River area (KwaZulu-Natal)	-29,66777778	30,85583333	19
South Africa	Venus (KwaZulu-Natal)	-29,46145556	29,86349444	1
South Africa	Vendaland (northern Transvaal) Limpopo River Basin	-22,97075556	30,58423889	2
South Africa	Kroondal (North-West Province)	-25,807525	27,31369444	1
South Africa	Bokoni Area (Orighstad, Lydenburg, Nelspruit, Machadorp, Carolina, Komati River)	-25,22527778	30,742475	10
South Africa	Vredefort Dome (Free-State Province)	-26,99828611	27,50161944	3
South Africa	Kamdeboo District (Karoo)	-32,257925	24,53833333	1
South Africa	Den Staat (Limpopo Basin)	-22,23784167	29,25499444	2
South Africa	Scottburgh (KwaZulu-Natal)	-30,28669444	30,75491389	5
South Africa	Umloti (KwaZulu-Natal)	-29,66694444	31,11807222	3
South Africa	Kosi Bay (KwaZulu-Natal)	-26,99395833	32,81698611	1
South Africa	Rose Cottage Cave (Caledon River Valley sites, Free State)	-29,21666667	27,46666667	13
South Africa	Caledon River Valley sites (central point)	-29,18016944	27,12392222	7
South Africa	Kakamas area (Northern Cape) (Eniqualand)	-28,75973889	20,53971111	7
South Africa	St Lucia area (KwaZulu-Natal)	-28,37796389	32,41301667	3
South Africa	Hluhluwe area (KwaZulu-Natal)	-28,02650278	32,27956667	4
South Africa	Umfolozi (KwaZulu-Natal)	-28,36872222	31,95203889	1
South Africa	Upland Area (Hall)(KwaZulu-Natal)	-28,22831389	31,08226667	1
South Africa	Durban Area (Mzonjani)	-29,73333333	31,05416667	4
South Africa	Ladysmith (KwaZulu-Natal)	-28,57052778	29,77664444	1
South Africa	Pietermaritzburg (KwaZulu-Natal)	-29,60441389	30,38061944	2
South Africa	Port Edward (KwaZulu-Natal)	-31,04933889	30,22213889	1
South Africa	Inanda area (KwaZulu-Natal)	-29,699925	30,95351944	2
South Africa	Howick (KwaZulu-Natal)	-29,49838056	30,21724444	1
South Africa	Escourt (KwaZulu-Natal)	-29,03659722	29,86334722	2
South Africa	Greytown (KwaZulu-Natal)	-29,09529722	30,60583333	1

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3.3.2. S2 Table. Southern African publication count for research on farming and pastoralism for the period 1950 to 2016 (Database 2).

Country	Geographic site	Latitude	Longitude	Number of publications
South Africa	Muden area (KwaZulu-Natal)(Mhlopeni and Ntshekane sites)	-28,974975	30,384125	4
South Africa	Transkei (Ntsitsana) Eastern Cape	-31,06666667	29,2	2
South Africa	Msuluzi Confluence (KwaZulu-Natal)	-28,75555556	30,14583333	4
South Africa	Ondini (oNdini) (KwaZulu-Natal)	-28,36064444	31,49011667	3
South Africa	Musina (Stayt)(Limpopo Basin)	-22,33001111	30,04065556	2
South Africa	central Thukela Basin (iNkolimahashi)	-28,79416667	30,18055556	4
South Africa	Pilansberg area (North-west Province)	-25,30282222	27,054375	3
South Africa	Nkandla (Inkandla)(KwaZulu-Natal	-28,63097778	31,10629167	1
South Africa	Eshowe (KwaZulu-Natal)	-28,96639167	31,49135556	2
South Africa	Biggarsberg (Dundee-Nkupe, Mzinyashana 1 and 2) (KwaZulu-Natal)	-28,20100833	30,16248056	11
South Africa	Tuinplaas (Gauteng)	-25,81162778	28,32632222	1
South Africa	Elands Bay (Western Cape)	-32,32313889	18,35013611	28
South Africa	Bushmanland (Northern Cape)	-29,39205833	21,21933333	2
South Africa	Magaliesburg Area (North-west Province/Gauteng)	-26,00023611	27,54588333	20
South Africa	Vredenburg Penninsula (Western Cape)	-32,92229722	17,99515833	22
South Africa	Hondeklipbaai area (Spoegrivier)	-30,3288	17,29633056	12
South Africa	Southern Cape coast (Die Kelders)	-34,56503889	19,35854722	11
South Africa	Southern Cape coast (Blombos)	-34,41048056	21,21824444	7
South Africa	Tierkloof (Kouga Mountains, Eastern Cape)	-33,74765278	24,93729722	2
South Africa	Ghaap area (Northern Cape	-28,38152222	24,22532222	3
South Africa	Kuruman Hills area (Wonderwerk Cave) Northern Cape (Eniqualand)	-27,567025	23,47758611	13
South Africa	Seacow River Vally (survey) Karoo (central point)	-31,43753056	24,72008056	31
South Africa	Lydenburg (Mpumalanga)	-25,08341667	30,44746111	5
South Africa	Sonquasdrift (western Cape)	-33,38493333	18,97693611	5
South Africa	Badfontein (Mpumalanga)	-26,03604167	30,821325	4
South Africa	Boomplaas (southern Cape coast)	-33,38333333	22,18333333	9
South Africa	Klipriviersberg (Gauteng)	-26,30376667	28,01093056	2
South Africa	Suikerbosrand (Gauteng/Free State)	-26,48399722	28,22940278	7
South Africa	Sun City (North West Province)	-25,37654444	27,09879722	1
South Africa	Rooiberg Area (Limpopo Basin)	-24,7994	27,74399722	6
South Africa	Upington area (Northern Cape)	-28,35753333	21,24500833	1
South Africa	Hans Merensky Nature Reserve (Limpopo Basin)1	-23,79536389	30,66901111	2
South Africa	Kamieskroon area (Namaqualand)	-30,22431389	17,92540833	1
South Africa	Gamoep Area (Namaqualand)	-29,93995556	18,42955556	1
South Africa	Kuboes (Khubus) Area (Namaqualand)	-28,45344167	16,99483889	2
South Africa	Port Nolloth (Namaqualand)	-29,32661389	16,90172222	2
South Africa	Garies (Namaqualand)	-30,60015833	17,98475	1
South Africa	Bitterfontein (Namaqualand)	-31,08976389	18,27360278	1
South Africa	Baleni Area (Limpopo Basin)	-23,43154722	30,90833611	3
South Africa	Helpmakaar (Kwazulu-Natal)	-28,43612778	30,41647778	6
South Africa	Bomvu Ridge, Ntabebomvu, KwaZulu-Natal	-28,06606667	30,695	1
South Africa	Nelspruit (mpumalanga)	-25,47551944	30,96946389	1
South Africa	Plaston White River Area (Mpumalanga)	-25,33333333	31,06666667	1
South Africa	Wylies Poort area (Limpopo Basin)	-22,95307222	29,95015833	1
South Africa	Saldahna Bay (Western Cape)	-33,02668611	17,91686111	9

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3.3.2. S2 Table. Southern African publication count for research on farming and pastoralism for the period 1950 to 2016 (Database 2).

Country	Geographic site	Latitude	Longitude	Number of publications
South Africa	Simon's Town (False Bay area) (Western Cape)	-34,19943056	18,43632222	7
South Africa	Vanrhynsdorp area (Orton) (Namaqualand)	-31,66326944	18,76795	2
South Africa	Groblersdal area (Limpopo)	-25,17287778	29,398275	1
South Africa	Tzaneen area (Limpopo)	-23,83891389	30,13803056	6
South Africa	Postmasburg (Ghaap area, Northern Cape)	-28,38167222	23,12121389	7
South Africa	Barkly East (Eastern Cape)	-30,97384444	27,59296667	3
South Africa	Ugie District area (Eastern Cape) (part of Barkly East)	-31,21239722	28,23529444	2
South Africa	Dordrecht district area (Eastern Cape and part of Barkly east)	-31,37483611	27,03896111	2
South Africa	Polokwane (Pietersburg) central Limpopo	-23,90283056	29,45145278	2
South Africa	Klasies River area (Eastern Cape)	-34,09879722	24,40128611	2
South Africa	Makgabeng (Limpopo)	-23,24874167	28,89762778	3
South Africa	Kaditshwene (Limpopo) Tswana state	-23,92671389	28,72465278	2
South Africa	Badplaas (eManzana) area, Mpumalanga (Honingklip)	-25,95743333	30,53941667	4
South Africa	Bloubos area (north of Upington) Northern Cape	-28,11690278	20,814125	4
South Africa	Biesiepoort area (Upington area) (Eniqualand)	-28,31996944	20,18214167	4
South Africa	Swartkop area (Northern Cape) (Eniqualand)	-29,58175278	21,19258056	4
South Africa	Kei River Area (Eastern Cape)	-33,41415278	27,05627222	1
South Africa	Victoria East (Eastern Cape, Derricourt Ciskei)	-32,84166667	26,8	1
South Africa	King Williams Town (Eastern Cape, Derricour Ciskei)	-32,74583333	27,30555556	1
South Africa	Glen Grey District (Eastern Cape, Derricourt Ciskei)	-31,79166667	27,03333333	1
South Africa	Queenstown (Eastern Cape, Derricourt)	-31,93129722	26,96936111	1
South Africa	Komgha (Eastern Cape, Derricourt)	-32,60833333	27,775	1
South Africa	Fort Beaufort (Eastern Cape, Derricourt)	-32,76802778	26,62168611	4
South Africa	East London (Eastern Cape)	-33,02797222	27,85411389	1
South Africa	Middledrift (Eastern Cape)	-32,80086667	26,98233611	1
South Africa	Ngcobo (Eastern Cape)	-31,73881111	27,98739722	1
South Africa	Sutterheim (Eastern Cape)	-32,58988889	27,43286389	1
South Africa	cental locator for the coastal midden sites of the Eastern Cape (Derricourt)	-32,51648333	28,59537222	1
South Africa	Carnavon, Northern Cape	-30,96144722	22,074975	2
South Africa	Jagt Pan (Northern Cape)	-30,47878611	21,63881111	3
South Africa	Lamberts Bay (west coast South Africa)	-32,10428889	18,32740556	8
South Africa	Verloren Vlei (near Elands Bay) West Coast	-32,33408056	18,41913611	10
South Africa	Mazeppa Bay (Eastern Cape)	-32,47441389	28,64163611	1
South Africa	Soutpansklipheuwel (West Coast)	-32,01455	18,33287778	1
South Africa	Geelbek Dunes (near Langebaan, Western Cape)	-33,19060556	18,15375556	3
South Africa	Melkhoutboom (Deacon) Eastern Cape	-33,31666667	25,28333333	4
South Africa	Cradock District (Eastern Cape) Deacon, Highlands Rockshelter	-32,19572222	25,65145	1

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3.3.2. S2 Table. Southern African publication count for research on farming and pastoralism for the period 1950 to 2016 (Database 2).

Country	Geographic site	Latitude	Longitude	Number of publications
South Africa	Tsitsikama National Park (Eastern Cape) Deacon	-34,01717778	23,85739167	2
South Africa	Pearston District (Eastern Cape) Deacon	-32,57910278	25,13886667	1
South Africa	Grahamstown (Eastern Cape)	-33,33103889	26,52970556	1
South Africa	Table Bay (Western Cape)	-33,90550833	18,47793611	5
South Africa	Cape of Good Hope, Cape Town (Western Cape)	-34,35688611	18,47401111	4
South Africa	Scotts Cave (Eastern Cape near the Gamtoos River Mouth)	-33,89610278	25,05383056	4
South Africa	Majies River area (Western Cape)	-34,00141111	23,46954722	5
South Africa	Nelson Bay (western Cape)	-34,08771111	23,357	5
South Africa	Die Toon (Richtersveld, Northern Cape) Webley	-28,31111111	17,28333333	1
South Africa	Riet River (Northern Cape) (Inside Ghaap and Gariet Survey area)	-28,99759444	23,889825	1
South Africa	Griekwastad (Griquatown) Northern Cape(Inside Ghaap and Gariet Survey area)	-28,86818333	23,252825	1
South Africa	Niekershoop area (Northern Cape)(Inside Ghaap and Gariet Survey area)	-29,32763333	22,82105556	1
South Africa	Hartebeespoort Dam (North West Province)	-25,7431	27,86468056	1
South Africa	Pinnacle Point (near Mossel Bay) Western Cape	-34,20325	22,08644444	3
South Africa	Plettenburg Bay (Western Cape)	-34,05753611	23,36567222	3
South Africa	Danielskuil (Northern Cape) (Eniqualand)	-28,19879722	23,56350833	2
South Africa	Knersvlakte (Western Cape)	-31,58825556	18,48837778	3
South Africa	Blydefontein (Northern Cape)	-31,16106111	25,06861389	8
South Africa	Kenhardt (Northern Cape) (Eniqualand)	-29,35423056	21,21306944	1
South Africa	Prieska (Northern Cape) (Eniqualand)	-29,70732222	22,73953611	1
South Africa	Brandvlei (Northern Cape) (Eniqualand)	-30,51181667	20,43815556	1
South Africa	Vanwyksvei (Northern Cape) (Eniqualand)	-30,33259167	21,80945	1
South Africa	Pofadder (Northern Cape) (Eniqualand)	-29,23011944	19,4084	1
South Africa	Wildebeest Kuil (Northern Cape near Kimberley) (Eniqualand)	-28,66892778	24,65176389	1
South Africa	Keimoes (Northern Cape, near Upington)	-28,555225	20,89128056	1
South Africa	Rooiwalbaai Area (Namaqualand)(Northern Cape)	-30,45102778	17,34875	1
South Africa	Malmesbury District (Western Cape)	-33,46544444	18,72089444	1
South Africa	Voelvlei (Western Cape)	-33,33755833	19,03361944	1
South Africa	Venterstad (Eastern Cape) near the lower Seacow River Valley survey)	-30,75804167	25,78785	1
South Africa	Kleinsee Area (central point of Dewar's study area on coastal shell middens, Namaqualand, Northern Cape	-29,69194444	17,07386667	3
South Africa	Cathcart (Eastern Cape)	-32,30405	27,13239722	2
South Africa	Rustenburg area (North West Province)	-25,65508333	27,25608889	5
South Africa	Hout Bay (Western Cape)	-34,02339167	18,37022222	2
South Africa	Robberg (Western Cape)	-34,10443889	23,39521944	2
South Africa	Knysa area (Western Cape)	-34,03515833	23,04647222	1
South Africa	Melbosstrant (Western Cape)	-33,722175	18,46068889	3

Appendix 3

3.3.2. S2 Table. Southern African publication count for research on farming and pastoralism for the period 1950 to 2016 (Database 2).

Country	Geographic site	Latitude	Longitude	Number of publications
South Africa	Ysterfontein (Western Cape)	-33,36175556	18,16121111	3
South Africa	Great Fish River area (Simon Hall research area)	-33,39531389	27,05019444	1
South Africa	Tankwa Karoo National Park (Western and Northern Cape)	-32,29268611	20,12369167	1
South Africa	East Rand (Gauteng)	-26,18276389	28,34619444	1
South Africa	Orighstad (Limpopo)	-24,69641111	30,57986667	5
South Africa	Babanango area (KwaZulu-Natal)	-28,37746667	31,08666944	1
South Africa	Clanwilliam District (Western Cape)(Klein Kliphuis)	-32,19777778	18,89685833	12
South Africa	Border Cave (KwaZulu-Natal)	-27,03490278	31,97753889	3
South Africa	Gordonia (Upington area)(Northern Cape)	-28,46092222	21,24161667	3
South Africa	Sandy Bay (Western Cape)	-34,02452778	18,331975	1
South Africa	Darling District (Western Cape)	-33,37648611	18,38603611	1
South Africa	Sutherland District (Northern Cape)	-32,41069444	20,67064444	1
South Africa	Vleesbaai (Western Cape)	-34,29699444	21,91364167	1
South Africa	Elandsfontein (Western Cape)	-33,169525	19,33488611	2
South Africa	Pearly Beach Area (Western Cape)	-34,65814722	19,48881111	1
South Africa	Petrusburg area (Voigtspost) Free State	-29,12050556	25,41456389	1
South Africa	Stellenbosch area (Western Cape)	-33,93591389	18,85975278	1
South Africa	Doringbaai (West coast)	-31,82023611	18,23925278	1
South Africa	Welgeluk (Eastern Cape)	-32,91263889	26,42444444	3
South Africa	Uniondale (Eastern Cape)	-33,25	26,65	3
South Africa	Bultfontein (Free State)	-28,27956389	26,14981111	1
South Africa	Alicedale District, Wilton Site (Eastern Cape)	-33,34691667	26,07405278	2
South Africa	Klip River (Free State)	-27,16666667	29,16666667	1
South Africa	Collingham (near Venus) (KwaZulu-Natal)	-29,45972222	29,79583333	5
South Africa	Diamond Shelter (KwaZulu-Natal)	-28,49222222	28,94777778	3
South Africa	Clarke's Shelter (KwaZulu-Natal)	-29,02083333	29,31611111	4
South Africa	Ghele Shelter (KwaZulu-Natal)	-29,12972222	29,90611111	3
South Africa	Mhlwazini (KwaZulu-Natal)	-29,04777778	29,39027778	4
South Africa	KwaThwaleyakhe (KwaZulu-Natal)	-28,91361111	30,44361111	4
South Africa	Good Hope shelter (underberg) KwaZulu-Natal	-29,65611111	29,42722222	2
South Africa	Esinhloweni (KwaZulu-Natal)	-28,8425	30,16583333	3
South Africa	Mbabane (KwaZulu-Natal)	-28,75555556	30,37416667	3
South Africa	Bellview (KwZulu-Natal)	-29,81444444	29,16805556	2
South Africa	Haaskraal, Volstruisfontein and Boundry Shelter	-32,539375	23,13158056	2
Swaziland	Mayiwane area (Hhohho Region) central point	-25,87181111	31,50852222	1
Swaziland	Mpofu site	-26,09222222	31,48277778	1
Swaziland	Mbabane central point	-26,30608611	31,13675556	3
Swaziland	Manzini central point	-26,51543056	31,37424167	1
Swaziland	Simunye central point	-26,11384444	31,91744167	3
Swaziland	Sophiso Shelter (Lubombo escarpment)	-26,31388889	31,975	2
Swaziland	Ngwenya (near South African border)	-26,23068611	31,04180556	3
Swaziland	Swazisyra	-27,12915833	31,14156111	1
Zambia	Gundu and Ndonde (near Batoka District), southern Zambia	-16,75	27,28333333	3
Zambia	Kumadzulo (southern Zambia) near Sibaluboyi District	-17,61666667	25,53333333	5

Appendix 3

3.3.2. S2 Table. Southern African publication count for research on farming and pastoralism for the period 1950 to 2016 (Database 2).

Country	Geographic site	Latitude	Longitude	Number of publications
Zambia	Southern Province Survey area (Vogel) central locator point	-17,68238611	25,89317222	14
Zambia	Nyimba (Sasare) Eastern Zambia (Phillipson)	-14,21515	1,180419444	1
Zambia	Chiwekwe (Chikwapa) Eastern Zambia (Phillipson)	-14,06713611	31,35006111	1
Zambia	Kakwela (Kawala) Eastern Zambia (Phillipson)	-13,96764722	31,433	1
Zambia	Makwe (Eastern Zambia) (Phillipson)	-14,41333333	31,93333333	6
Zambia	Songwe (Eastern Zambia)(Phillipson)	-14,34396944	32,16226389	1
Zambia	Mtovu (Eastern Zambia)(Phillipson)	-14,42502778	31,89701389	1
Zambia	Kamnama (Eastern Zambia) (Phillipson)	-13,51666667	32,83333333	3
Zambia	Chipata District (Thandwe) (Eastern Zambia) (Phillipson)	-13,65515278	32,6475	5
Zambia	Kalambo Falls (near Mpulungu and Mbala Districts)(Northern Province)	-8,707891667	30,99740556	12
Zambia	Twin River (near Lusaka)	-15,73229167	28,07507222	3
Zambia	Leopard's Hill Cave (near Lusaka)	-15,41666667	28,71666667	5
Zambia	Nakapula (Serenje)(Central Province)	-13,285725	30,23569444	5
Zambia	Mulungushi River area (Central Province)	-14,30590556	28,57453056	2
Zambia	Livingstone area (Prinsloo)	-17,85351944	25,82858056	4
Zambia	Victoria Falls (Mubuyu)	-17,92451111	25,85720833	6
Zambia	Kabwe District (central Province)	-14,43141389	28,45275833	2
Zambia	Muchinga Escarpment (Nachikufu Cave and Shelter, Nsalu Cave, Bimbe wa Mpalabwe Shelter, Central Province central locator point	-12,23333333	31,25	27
Zambia	Batoka Plateau (Ingombe Ilede) (Gwembe District)	-16,2	28,8	8
Zambia	Siamoba (Batoka Plateau) (Gwembe District)	-16,10284444	28,72032222	1
Zambia	Sigona (Batoka Plateau) (Gwembe District)	-16,06951944	28,68381389	1
Zambia	Lusitu (Batoka Plateau) (Gwembe District)	-16,136325	28,83388611	1
Zambia	Saluselo (Batoka Plateau) (Gwembe District)	-16,17197778	28,82941944	1
Zambia	Namunyama and Kabuyu (Batoka Plateau) (Gwembe District)	-16,15475833	28,81187778	1
Zambia	Selous Island (Batoka Plateau) (Gwembe District)	-16,05368611	28,85065	2
Zambia	Kanyemba Isand (Kafue and Zambezi meet)	-15,95	28,91666667	1
Zambia	Dambwa (inside Vogel Southern Zambezi research area)	-17,75555556	25,84861111	3
Zambia	Kalomo District (Behrens and Lion Kop)	-17,03044444	26,47836111	1
Zambia	Isamu Pati (Southern Province)	-17,06666667	26,33333333	4
Zambia	Gwisho Hot Springs (Central Province)	-16,0028	27,24444167	7
Zambia	Luapula Province (Northern) central locator point from Mansa	-11,19833611	28,88947222	1
Zambia	Chishi Island (Lake Bangweulu)	-11,07798333	29,85314444	2
Zambia	Chongwe Area	-15,33334444	28,67923333	1
Zambia	Twickenham Road (Chakeluka)	-15,4	28,3	5

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3.3.2. S2 Table. Southern African publication count for research on farming and pastoralism for the period 1950 to 2016 (Database 2).

Country	Geographic site	Latitude	Longitude	Number of publications
Zambia	Machilli Valley research area (Nanga and Namkala) central locator point	-16,62018056	25,07526944	6
Zambia	Upper Zambezi River (between Sesheke and Senanga) Western Province central locator point	-16,82456667	23,82622222	8
Zambia	Chingola Area (Copperbelt)	-12,547775	27,85437778	3
Zambia	Itezhitezhi survey area (Central Province)	-15,76965278	25,99508333	5
Zambia	Basanga and Mwanamaimpa (Itezhitezhi District)	-15,83333333	26,08333333	4
Zambia	Simbusenga (Southern Province)	-17,53324444	25,57245556	3
Zambia	Lochinvar National Park (Central Province)	-15,92408611	27,24887778	1
Zambia	South Luangwa National Park (Eastern Zambia)	-13,01856667	31,53634167	3
Zambia	Chondwe (Copperbelt)	-13,19444444	28,77666667	5
Zambia	Chifubwa Stream (North Western Province)(Solwezi District)	-12,20280556	26,38108611	1
Zambia	Mumbwa Cave (Central Province)	-14,93333333	26,93333333	8
Zambia	Kandanda (Southern Province)	-17,43333333	24,2	4
Zambia	Mwela Rocks	-10,25670833	31,23533056	3
Zambia	Samfya Forest (Luapula Province) near Lake Bangweulu	-11,24266944	29,44136667	4
Zambia	Chilimulio, Filato and Kangonga (Lunsemfwa Basin) Central Province	-13,4	28,88333333	7
Zambia	Mulfulwe (Lunsemfwa Basin) Central Province	-13,96666667	29,58333333	4
Zambia	Mwambacimo (Lunsemfwa Basin) Central Province	-13,46666667	28,75	2
Zambia	Kavumba Loop Kopje (near the Itezhitezhi District survey)	-15,51666667	25,91666667	1
Zambia	Upper Zambezi River Basin (Phillipson) survey area 2 (near Angola) central locator point	-13,04442778	22,84431667	1
Zambia	Upper Zambezi River Basin (Phillipson) survey area 1 (Kaoma District) central locator point (Lubusi)	-14,81747222	24,79768056	3
Zambia	Upper Zambezi River Basin (Phillipson) survey area 4 (between Livingstone and Shesheke)	-17,52998889	24,97643889	1
Zambia	Sebanzi Hill (Southern Province)	-16,00266389	27,23769444	1
Zambia	Kalundo Mound (Kalomo District) Batoka Plateau	-17,05	26,5	10
Zambia	Zambezi Farm (Southern Province)	-17,81666667	25,61666667	2
Zambia	Chundu (Southern Province)	-17,79193889	25,63224167	6
Zambia	Kamangoza (Southern Province)	-17,61666667	25,53333333	4
Zambia	Singoma (Southern Province)	-17,56040556	25,51429167	1
Zambia	Mukuni District (Ngandu, Machenje, Mukuni) (Southern Province)	-17,90602778	25,93764722	1
Zambia	Bovu Dambu (Simandamuna) (Southern Province)	-17,70335556	25,55059444	1
Zambia	Sinde District (Sinde) (Southern Province)	-17,64985	25,83333333	2
Zambia	Simonga (Southern Province)	-17,63995556	25,78995833	1
Zambia	Syapeni (Southern Province)	-17,92465833	25,97973056	1

Appendix 3

3.3.2. S2 Table. Southern African publication count for research on farming and pastoralism for the period 1950 to 2016 (Database 2).

Country	Geographic site	Latitude	Longitude	Number of publications
Zambia	Nikisi area (Guzwe) (Southern Province)	-17,48333333	25,61668333	1
Zambia	Mosi-oa-Tunya National Park (former Livingstone Forest Reserve) (Peters site) (Southern Province)	-17,87121944	25,81079722	1
Zambia	Abercorn (Mbala) Northern Zambia	-8,862911111	31,36740278	2
Zambia	Mongu District (Upper Zambezi Rivery survey area)	-15,289675	23,14266389	1
Zambia	Sinazongwe (Southern Province)	-17,24041111	27,48375	1
Zambia	Njame and Kasoko	-15,95481111	28,89491389	2
Zambia	Chakeluka (Lusaka)	-15,39253333	28,30428333	2
Zambia	Kapwirimbwe, Lusaka	-15,38333333	28,36666667	6
Zambia	Lake Kariba Area (Southern Province)	-16,70124722	28,04508333	2
Zambia	Kasempa District (North-Western Province)	-13,4953	25,829075	1
Zambia	Situmpa (Machili)	-16,85	25,11666667	3
Zambia	Kaprir Mposhi (Central Province)	-13,96666667	28,66666667	1
Zambia	Kitwe District (Copperbelt)	-12,83044444	28,21912222	1
Zambia	Ndola District (Copperbelt)	-12,99575833	28,65038611	1
Zambia	Luanshya District (Copperbelt)	-13,15161389	28,41906389	1
Zambia	Mujala (near Sinde) Southern Province (Vogel)	-17,69687778	25,78149167	1
Zambia	Njanji and Musya (Southern Province) (Vogel)	-17,7	25,86666667	1
Zambia	Kabondo Kumbo (Southern Province)(Vogel)	-17,68333333	25,83333333	2
Zambia	Strydom Farm (Southern Province)	-17,83333333	25,91666667	1
Zimbabwe	Bambata Cave (Matopos)	-20,50277778	28,40694444	6
Zimbabwe	Beit Bridge (South Matebeleland)	-22,19933889	30,00301667	2
Zimbabwe	Tshangula Cave (Matopos)	-20,83333333	28,53333333	6
Zimbabwe	Inyanga (nyanga) Manica Province	-18,22082778	32,74644167	11
Zimbabwe	Chibi District (Masvingo Province)	-20,33244722	30,50826944	1
Zimbabwe	Dombozanga Cave	-21,85596667	30,23125	4
Zimbabwe	Gwanda District (South Matebeleland)	-20,94418333	29,01126389	1
Zimbabwe	Amadzimba (Matopos) (South Matebeleland)	-20,66666667	28,75	3
Zimbabwe	Ntunje (Matopos) (South Matebeleland)	-20,46666667	28,66666667	2
Zimbabwe	Matopos National Park central locator point (South Matabeleland)	-20,56107778	28,51283889	10
Zimbabwe	Cave of Bees (Matopos) (South Matabeleland)	-20,50416667	28,50972222	3
Zimbabwe	Pomongwe (Matopos)(South Matabeleland)	-20,54722222	28,51388889	6
Zimbabwe	Kalanyoni Shelter (Matopos)(South Matabeleland)	-20,54027778	28,48472222	1
Zimbabwe	Maleme Dam (Matopos)(South Matabeleland)	-20,53888889	28,50138889	2
Zimbabwe	Lazi (Matopos)(South Matabeleland)	-20,51666667	28,43472222	1
Zimbabwe	Gumali Cave (Matopos)(South Matabeleland)	-20,51388889	28,44861111	1
Zimbabwe	World's View Shelter (Matopos) (South Matabeleland)	-20,49166667	28,50416667	1
Zimbabwe	Tsindi Hill (Moshonaland East) (Lekkerwater)	-18,09493889	31,70811111	2
Zimbabwe	Mount Buchwa (Masvingo Province)	-20,61651944	30,38275	1

Appendix 3

3.3.2. S2 Table. Southern African publication count for research on farming and pastoralism for the period 1950 to 2016 (Database 2).

Country	Geographic site	Latitude	Longitude	Number of publications
Zimbabwe	Malilangwe area (Indunda Cave) (Masvingo Province) central locator point	-20,57539167	31,65125278	5
Zimbabwe	Leopard's Kopje Site (Bulawayo)	-20,11666667	28,43333333	6
Zimbabwe	Bulawayo (Bulawayo Province)	-20,15424722	28,53451389	5
Zimbabwe	Mutare (Umtali) Manica Province	-18,97699444	32,65058611	2
Zimbabwe	Gwelo (Gweru) (Midlands Province)	-19,48733333	29,81412222	3
Zimbabwe	Harare (Salisbury) Harare Province central locator point	-17,83026111	31,036	3
Zimbabwe	Livingstone (Victoria Falls area)	-17,93445	25,83344722	2
Zimbabwe	Site Area 1 (South Matabeleland) along Limpopo River central locator point	-21,907525	29,74294722	1
Zimbabwe	Great Zimbabwe (Masvingo Province)	-20,27201111	30,93320556	40
Zimbabwe	Redcliff (Midlands Province)	-19,02554167	29,78224167	4
Zimbabwe	Gokomere Cave (Masvingo Province)	-19,96604722	30,77839722	7
Zimbabwe	Bambuzi (Pandamatenga District) Matabeleland North	-18,26985833	25,651325	1
Zimbabwe	Mutembera (Manicaland Province)(Manjowel and Gwenzi)	-19,550125	32,66670833	1
Zimbabwe	Nyazongo (Manicaland Province)	-18,66784167	32,7865	1
Zimbabwe	Gosho (Marondera District) Moshonaland East	-18,18000556	31,62775278	2
Zimbabwe	Rusape District (Pfuri and Mtemwa) (Manicaland Province)	-18,53555833	32,13514722	3
Zimbabwe	Khami (Bulawayo)	-20,14259444	28,42683611	6
Zimbabwe	Hillside District (Bulawayo)	-20,20161944	28,60033333	5
Zimbabwe	Kamukombe (Moshonaland Central)	-16,39530556	31,01333333	3
Zimbabwe	Kadzi (Moshonaland Central)	-16,57738611	30,76109722	4
Zimbabwe	Kasekete (Moshonaland Central)	-16,65121389	30,70231111	5
Zimbabwe	Murahwa's Hill	-17,99418889	32,77222778	1
Zimbabwe	Samakande	-17,46472222	32,78972222	3
Zimbabwe	Hwange (Matabeleland North)	-18,41046389	26,49595556	3
Zimbabwe	Ndongo (Manicaland)	-20,03091667	32,48389722	2
Zimbabwe	Mazowe District (Moshonaland Central)	-17,51251111	30,97807778	1
Zimbabwe	Wedza Mountains (Moshonaland East)	-18,76547778	31,71860556	1
Zimbabwe	Richmond Farm (Bulawayo) (Upper Umguza Valley)	-20,06666667	28,55	2
Zimbabwe	Keendale Farm (Bulawayo) (Upper Umguza Valley)	-20,01666667	28,53333333	2
Zimbabwe	Mawala Hill and Nali Hill (Bulawayo) (Upper Umguza Valley)	-19,96666667	28,58333333	2
Zimbabwe	Matestsi Hill (near Bulawayo) (Upper Umguza Valley)	-19,95	28,53333333	3
Zimbabwe	Umfazimete Hill (near Bulawayo) (Upper Umguza Valley)	-19,88333333	28,85	1
Zimbabwe	Silver Spring Farm (Bulawayo) (Upper Umguza Valley)	-19,93333333	28,53333333	1
Zimbabwe	Rennydene Farm (Bulawayo) (Upper Umguza Valley)	-19,91666667	28,53333333	1
Zimbabwe	Koce River (Upper Umguza Valley)	-19,88333333	28,6	1
Zimbabwe	Umguza Estate (Upper Umguza Valley)	-19,93333333	28,5	1
Zimbabwe	Njenile Farm (Bulawayo) (Upper Umguza Valley)	-19,98333333	28,51666667	1
Zimbabwe	Denver Farm (Bulawayo) (Upper Umguza Valley)	-20,03333333	28,51666667	1

Appendix 3

3.3.2. S2 Table. Southern African publication count for research on farming and pastoralism for the period 1950 to 2016 (Database 2).

Country	Geographic site	Latitude	Longitude	Number of publications
Zimbabwe	Umvutcha Farm (Bulawayo) (Upper Umguza Valley)	-20,06666667	28,6	1
Zimbabwe	Chitope (Mashonaland West)	-15,89923889	29,81302222	2
Zimbabwe	Darwendale Area (Mashonaland West) (Upper Hunyani River)	-17,73091111	30,55395833	1
Zimbabwe	Mount Hampden (Harare)	-17,72987222	30,94762222	1
Zimbabwe	Warren Park (Harare)	-17,8342	30,97956667	1
Zimbabwe	Castle Kopje (Manicaland)	-18,46666667	31,48333333	1
Zimbabwe	Shamva Hill (Maxton Farm) (Mashonaland Central)	-17,06161944	31,67689444	2
Zimbabwe	Mapela Hill (Matabeleland South)	-21,289	29,12474722	2
Zimbabwe	Montevidea (Masvingo)	-20,275	30,69166667	4
Zimbabwe	Gumanye (Masvingo)	-20,33506944	30,48409444	1
Zimbabwe	Matenderi (Matendera)(Zimbabwe Site) Manicaland	-19,53029167	31,80373056	1
Zimbabwe	Tere (Mashonaland East)	-17,32998611	32,22563333	1
Zimbabwe	Zvangombe (Mashonaland Central)	-16,74925556	31,33389167	2
Zimbabwe	Mutota (Mashonaland Central)	-16,55559722	31,11411667	2
Zimbabwe	Centenary Research area central locator point (Wadzi Hill, Heronden)	-16,74608056	31,12026667	5
Zimbabwe	Karoi District (Mashonaland West)	-16,84330556	29,69005278	1
Zimbabwe	Chamabvefva (Midlands)	-20,22083333	30,07916667	1
Zimbabwe	Pumula (Bulawayo)	-20,14443611	28,48352222	1
Zimbabwe	Tafuna Hill (Shamva District)(Mashonaland Central)	-17,39687778	31,52276111	2
Zimbabwe	Mabveni (near Guymane)(Mashava)	-20,36666667	30,46666667	6
Zimbabwe	Chinhoyi Caves (Mashonaland West)	-17,35966111	30,13039444	3
Zimbabwe	Copper Queen (Mashonaland West)	-17,55208611	29,84074444	2
Zimbabwe	Hurungwe District (Mashonaland West)	-16,34786389	29,60824167	3
Zimbabwe	Chedzurgwe (near Karoi) Mashonaland West	-16,78472222	29,62083333	1
Zimbabwe	Nyarinde River site (Mashonaland West)	-16,43194444	29,93611111	1
Zimbabwe	Nhunguza Ruin (Mashonaland East)	-17,38055556	31,67833333	2
Zimbabwe	Ruanga River (Mashonaland Central)	-16,77746389	31,34721944	4
Zimbabwe	Chipadze's Ruin (Chipadze District) (Mashonaland Central)	-17,31911944	31,33953889	1
Zimbabwe	Naletale Ruin (Matabeleland South)	-19,89065	29,52470278	2
Zimbabwe	Mateke Hills (Mwenezi District)(Masvingo)	-21,8299	30,98266667	3
Zimbabwe	Cawood (Mwenezi District)(Masvingo)	-21,71972222	30,86996111	2
Zimbabwe	Mwenezi Farm (Mwenezi District)(Masvingo)	-21,71408889	31,24688056	2
Zimbabwe	Sites in the Mwenezi District Area (Masvingo) central locator point	-21,95031111	30,76592222	1
Zimbabwe	Malumba (Mwenezi District)(Masvingo)	-21,89924722	30,91754722	3
Zimbabwe	Ziwa (Nyanga)(Manicaland)	-18,14309722	32,653925	4
Zimbabwe	Coronation Park (Harare)	-17,83689167	31,09871944	3
Zimbabwe	Cave of Offerings (Manicaland)	-18,19862222	32,56981667	1
Zimbabwe	Rupise Hotsprings (Manicaland)	-20,39217222	32,38758333	1
Zimbabwe	Mt Darwin (Shamva District) (Chomagora and Matanda Farm)	-16,87503333	31,62345	3
Zimbabwe	Madizwa (Madizwa District) Mashonaland Central (Baranda and Swart Village)	-16,91961111	31,53481111	6
Zimbabwe	Kwali Camp (Masvingo)	-21,03333333	31,86666667	1

Appendix 3

3.3.2. S2 Table. Southern African publication count for research on farming and pastoralism for the period 1950 to 2016 (Database 2).

Country	Geographic site	Latitude	Longitude	Number of publications
			Total publications	**2033**

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3.3.3. S3 Table. List of archaeological sites that were excluded from Database 1.

Site ID	Site Name	Country	Hunter-gatherer, pastoralist or farmer site	Radiocarbon date	Lab number	Reason for exclusion	References
HRS	Highlands Rockshelter	South Africa	Hunter-gatherer	3570±50	Pta-563	iii	[1]
MEL	Melkhoutboom	South Africa	Hunter-gatherer	2870±90 250±70	Pta-706 Gak-1537	iii	[1]
MAJ	Anne Shaw, Middledrift	South Africa	Pastoralist/Hunter-gatherer	2850±50	Pta-1030	iii	[2]
RIVM	Riversmead	South Africa	Hunter-gatherer	2645±95	GX-0723	iii	[3]
FAI	Fairview	South Africa	Hunter-gatherer	2450±55	Pta-2587	iii	[4]
WIL	Wilton	South Africa	Hunter-gatherer	2270±100	Gak-1540	i	[5]
STBF	Steenbokfontein	South Africa	Hunter-gatherer	2360±40 2200±50 2200±60	Pta-6136 Pta-6424 Pta-6136	iii	[6]
CAL	Calder's Cave	Zimbabwe	Farmer	1970±80	UCLA-929	ii	[7]
FURI	Furi I Mine	Angola	Farmer	1800±80	UCLA-170	ii	[8]
MUN	Munga Hill Site	Malawi	Farmer	1750±60	Pta-2752	i	[9]
MAD2	Madede 2	Malawi	Farmer	1680±50	Pta-2943	i	[9]
LANG	Langubhela	Swaziland	Farmer	1620±50	Pta-3346	i	[10]
KAN	Kansanshi Hill	Zambia	Farmer	1550±90 1320±85 1240±90 1190±85	N-128 N-1283 N-160 N-1284	i	[11, 12]
MAD1	Madede 1	Malawi	Farmer	1470±50	Pta-2740	i	[9]
DIAN	Diana's Vow	Zimbabwe	Farmer	1440±50	Pta-2001	i	[10]
KAMB	Kambari	Malawi	Farmer	1410±50	Pta-2744	i	[10]
KINS	Kinsale Farm	Zimbabwe	Farmer	1410±95	SR-117	ii	[13]
STS	Strauss	South Africa	Farmer	1410±110 1390±70	Wits-1531 Wits-1501	ii	[14]
FIC	Ficus	South Africa	Farmer	1400±40	Wits-782	Discovered too late for inclusion in this analysis	[14,15]
MUC	Mucuquesa 3 Mine	Angola	Farmer	1330±80	UCLA-711	i	[8]
SINO	Sinoia Caves	Zimbabwe	Farmer	1300±95	SR-118	i	[13]
MIL	Millbank	South Africa	Farmer	1290±50 1250±50 1200±50 1190±50 1190±45 1170±40 1090±50	Pta 6309 Pta 7468 Pta 6306 Pta 6307 Pta 7480 Pta 7478 Pta 6205	Discovered too late for inclusion in this analysis	[16]
NHA	Nhachengue	Mozambique	Farmer	1254±80	ST-8497	i	[17]
FET	Feti la Choya	Angola	Farmer	1240±100	Y-1240	i	[18]
BAS	Basanga	Zambia	Farmer	1220±120 1160±115	N-595 N-594	i	[19]
DUNA	Dundo Airfield	Angola	Farmer	1190±80	UCLA-716	i	[8]
DZ13	DZ13	Malawi	Farmer	1180±30 1150±70	Pta-2028 HAR-2400	ii	[9]

Appendix 3

3.3.3. S3 Table. List of archaeological sites that were excluded from Database 1.

Site ID	Site Name	Country	Hunter-gatherer, pastoralist or farmer site	Radiocarbon date	Lab number	Reason for exclusion	References
KLING	Klingbeil	South Africa	Farmer	1160±50 1120±50 1000±40	Pta-1633 Pta-2160 Pta-1747	ii	[20]
BEU	Beauley	South Africa	Farmer	1135±50 1120±50	Pta-595 Pta-5948	ii	[14]
PITS	Pitsane	Botswana	Farmer	1120±60 980±40	Pta-1817 Pta-1957	i	[20]
HOL	Hola Hola	Mozambique	Farmer	1060±50	R_1326	i	[17]
MSIN	Massingir 1/72	Mozambique	Farmer	1030±40	Pta-1640	i	[17]
XAI	Xai-Xai	Mozambique	Farmer	510±165	St-8589	ii	[17]

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Appendix 3

3.4.1. S1 Text. The full list of journals and reports consulted to compile Database

Journals and reports consulted for the compilation of Database 1

(1) African Archaeological Review
(2) African Studies
(3) American Anthropology
(4) Annals of the Ditsong National Museum of Natural History
(5) Annals of the Eastern Cape Museum
(6) Annals of the South African Museum
(7) Antiquity
(8) Azania: Archaeological Research in Africa
(9) Botswana Notes and Records
(10) Ciencias Biologicas
(11) Cimbebasia
(12) Current Anthropology
(13) Department of Water Affairs, Botswana (unpublished reports)
(14) Eduardo Mondlane University Mozambique, Central Board of National Antiquities, Sweden
(15) Journal of African Archaeology
(16) Journal of African History
(17) Journal of Archaeological Science
(18) Journal of Arid Environments
(19) Madoqua
(20) Malawi, Ministry of Local Government, Department of Antiquities (published reports)
(21) Man
(22) Navorsinge van die Nasionale Museum
(23) Nyame Akuma
(24) Paideuma
(25) PlosOne
(26) Quaternary International
(27) Radiocarbon
(28) Revista Portuguesa de Arquelogia
(29) Society of Malawi
(30) Southern African Field Archaeology
(31) South African Journal of Science
(32) Southern African Humanities (formerly known as Annals of the Natal Museum and Natal Museum Journal of Humanities)
(33) The South African Archaeological Bulletin
(34) The South African Archaeological Society, Goodwin Series

Appendix 3

3.4.2. S2 Text. An example of the full electronic search strategy used to capture data for Database 2.

Electronic search strategy used to capture data for Database 2.

Step 1: Ebsco Host Search database as accessed through web.b.ebscohost.com
The following Ebsco Host databases were consulted: Academic Search Complete and Africa-Wide Information. In this example we use Academic Search Complete.

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Step 2: Enter the three search terms: 'Archaeology', country (e.g. 'Botswana'), and additional identifier (e.g. 'Iron Age').

Set the following parameters:

a. Search Modes: Find all my search terms
b. Limit your results: Published date: January 1950 to December 2016
c. Special limiters for Academic Search Complete:
   Publication type: all
   Document type: all
   Language: all
   Special limiters for Africa-Wide Information:
   Publication Type: all
   Document type: all
   Language: all
   Data Contributor: all

Step 3:
In all the electronic database searches the total number of search results (i.e. published material) retrieved were inflated.
We excluded results that were:
(1) Related to other countries.
(2) Unrelated to the key terms of search.
(3) Too general.
(4) Not confined to a country but instead covered extensive geographic areas.
(5) Not relevant for the time period.
(6) Rock art publications. This is because we were interested in excavated sites.

In this example, in searching with the terms: 'Iron Age', 'Botswana' and 'Archaeology, 58 results were returned.

These search results were read and many excluded (see points 1 to 6 above). In this way, the total number of search results was reduced. In this example, after filtering, a total of 42 publications remained relevant to this study. These publications were then read to determine their geographical focus. In publications where archaeological sites were referenced, the geographic coordinates of these sites were used for the mapping exercise. When larger areas were referenced, the midpoint of the area was estimated on Google Earth Pro. The total number of publications per geographic coordinate set was then counted.

Appendix 3

3.4.3. S3 Text. A chronological summary for the appearance of livestock and directly dated pottery at southern African sites for the period 550 BC to AD 1056.

A summary for the chronological appearance of livestock and directly dated pottery at southern African sites for the period 550 BC to AD 1056.

Key:
Black font refers to LSA sites; red font refers to farmer sites; green font refers to fibre and grit tempered pottery sites and purple font refers to Iron working sites. The text can be read in conjunction with Figures 1 to 8 and figures S1- S8.

Group 1: 551 – 351 BC

Site ID and Site Name		Database Code	Livestock (conventional and AMS) and Direct date for pottery
LPC	Leopard Cave	3	sheep AMS
ZIT	Zitundo	1	carbon dated pottery
UNC	University Campus	1	carbon dated pottery

Group 2: 350 – 150 BC

Site ID and Site Name		Database Code	Livestock (conventional and AMS) and Direct date for pottery
LPC	Leopard Cave	3	sheep AMS
FAC	Fackeltrager	1	-
BBA	Bambata A	4	sheep/goat
CLK	Clarke's Shelter	1	-
UNID	Uniondale	1	-
SPR	Spoegrivier	2	sheep AMS
MES	Messum 1	5i	-
BOU	Boundary	1	fibre from pottery
ZIT	Zitundo	1	carbon dated pottery
UNC	University Campus	1	carbon dated pottery
CHG2	Changalane 2	1	carbon dated pottery
SIT	Situmpa	1	-

Group 3: 149BC – AD 51

Site ID and Site Name		Database Code	Livestock (conventional and AMS) and Direct date for pottery
LPC	Leopard Cave	3	sheep AMS
BBA	Bambata A	4	sheep/goat
CLK	Clarke's Shelter	1	-
UNID	Uniondale	1	-
SPR	Spoegrivier	2	sheep AMS
MES	Messum 1	5i	-
FSR	Falls Rock Shelter	3	sheep
ORU	Orunwanje 95/1	3	sheep/goat?
N2005/2		1	-
TOT1	Toteng 1	3	sheep AMS and cattle AMS
AIT	Ai Tomas	3i	sheep/goat
BOR	Border Cave	1	-
DK1	Die Kelders	1	-
OBP	Olieboomspoort	1	-
BLM	Blombos	3	sheep AMS
APL	Apollo Cave	1	-
BOU	Boundary Shelter	1	fibre from pot
HAA	Haaskraal	1	fibre from pot
ZIT	Zitundo	1	carbon dated pottery
UNC	University Campus	1	carbon dated pottery
CHG2	Changalane 2	1	carbon dated pottery

Appendix 3

3.4.3. S3 Text. A chronological summary for the appearance of livestock and directly dated pottery at southern African sites for the period 550 BC to AD 1056**.**

SIT	Situmpa	1	-

Group 4: AD 52 – 252

Site ID and Site Name		Database Code	Livestock (conventional and AMS) and Direct date for pottery
FSR	Falls Rock Shelter	3	sheep
TOT1	Toteng 1	3	sheep AMS and cattle AMS
AIT	Ai Tomas	3	sheep/goat
BOR	Border Cave	1	-
DK1	Die Kelders	1	-
OBP	Olieboomspoort	1	-
BLM	Blombos	3	sheep AMS
APL	Apollo Cave	1	-
OMU	Omungunda 99/1	1	-
REN	Renbaan	1	-
BUZ	Buzz Shelter	2	sheep
DEP	Depression Cave	1	-
HAW	Hawston	3	sheep
KBA	Kasteelberg A	3	sheep
COL	Colwinton	1	-
SKE	Skeurkrans	1	-
N2	N2000/2	1	-
SNR	Snake Rock	1	-
EGH	Edgehill	1	-
ORU	Orunwanje 95/1	1	-
SPR	Spoegrivier	2	sheep AMS
REC	Reception Shelter	1	-
GED	Geduld	3	sheep/goat?
BLY	Blydefontein	1	-
TOR	Tortoise Cave	1	-
BLO5	Bloubos 5	1	-
JKKM	Jakkalsberg M	3	sheep and sheep/goat
CAE	Cae Cae	1	-
KBDe	Kasteelberg De	3	sheep
DRL	Driel Shelter	1	-
JUB	Jubilee Shelter	1	-
HAA	Haaskraal	1	fibre from pot
VOL	Volstruisfontein	1	fibre from pot
SIT	Situmpa	1	-
CHG1	Changalane 1	1	carbon dated pottery
MAT	Matola IV	6	-
ZIT	Zitundo	6	-
RIA	Rian Rock Shelter	5	-
PHO	Phopo Hill	6i	-
LUM	Lumbi	1	-
BEF	Benfica	1	-
UNC	University Campus	6i	-
MTGL	Mitongwe/Liwadzi	1	-
KAMU	Kamukombe	1	-
SIL	Silver Leaves	7i	-
MTT	M'teteshi	5	-

Group 5: AD 253 – 453

Site ID and Site Name		Database Code	Livestock (conventional and AMS) and Direct date for pottery
DEP	Depression Cave	1	-

Appendix 3

3.4.3. S3 Text. A chronological summary for the appearance of livestock and directly dated pottery at southern African sites for the period 550 BC to AD 1056**.**

HAW	Hawston	3	sheep
KBA	Kasteelberg A	3	sheep AMS
SNR	Snake Rock Shelter	3i	sheep
EGH	Edgehill	1	-
TOT1	Toteng 1	3	sheep and cattle AMS and carbon dated pottery
BLY	Blydefontein	1	-
TOR	Tortoise Cave	3	sheep
BLO5	Bloubos 5	1	-
JKKM	Jakkalsberg M	3	sheep and sheep/goat
CAE	Cae Cae	1	-
KBDe	Kasteelberg De	3	sheep
JUB	Jubilee Shelter	1	-
DRL	Driel Shelter	1	-
ERO	Eros	1	-
SHH	Sehonghong	1	-
ORU	Orunwanje 95/1	3	goat
DUI	Duiker Eiland	1i	-
OMU	Omungunda 99/1	5	-
OBP	Olieboomspoort	1	-
SKE	Skeurkrans	1	-
DIK	Dikbosch	3	sheep/goat?
LMR	Limerock Shelter	3ii	sheep/goat ?(byre not directly associated to date)
CLH	Collingham Shelter	1	-
GED	Geduld	3	sheep/goat?
LOT	Lotshitshi	3	cattle
PBA	Pearly Beach Area	3i	sheep
NAU	Nauga	1	-
KBE	Kasteelberg E	1	-
APL	Apollo Cave	1	-
DK1	Die Kelders	1	-
BPS	Boomplaas	4i	sheep
VSS	Vonk se Stal	1	-
KSBD	!Khuseb Delta	1	-
KN41	KN2005/41	2	cattle AMS
BOK	Bokvasmaak	1	-
KN54	KN2005/54	1	-
CLK	Clarke's Shelter	1	-
HAA	Haaskraal	1	fibre from pot
SIT	Situmpa	1	-
ZIT	Zitundo	6	-
PHO	Phopo Hill	6i	-
BEF	Benfica	1	-
UNC	University Campus	6i	-
MTGL	Mitongwe/Liwadzi	1	-
MAT	Matola IV	6	-
KAMU	Kamukombe	1	-
SIL	Silver Leaves	7i	-
MAL	Malessane	1	-
LUS	Lusi	1	-
SMF	Samfya Forest	6i	-
EIL	Eiland Salt Works	1i	-
CHO	Chowo River	7i	-
MZJ	Mzonjani	6i	-
MAU	Maunatlala	7i	-
KAM	Kamnama	6i	-
GZP1	Great Zimbabwe	1i	-
NKP	Nkope	9	cow tooth
ENK	Enkwazini	1i	-
RIA	Rian Rock Shelter	5	-

Appendix 3

3.4.3. S3 Text. A chronological summary for the appearance of livestock and directly dated pottery at southern African sites for the period 550 BC to AD 1056**.**

KLA	Klein Afrika	9	cattle and goat
NAMB	Namaso Bay	6i	-
HPR	Happy Rest	9i	sheep, goat, sheep/goat and cattle
KLF	Kalambo Falls	6i	-
IND	Inanda Quarry	6i	-
CHD	Chondwe	1	-
CIG	Cigwa	5	-
RUU2	Ruuga 2	6	- charcoal from pottery

Group 6: AD 454 – 654

Site ID and Site Name		**Database Code**	**Livestock (conventional and AMS) and Direct date for pottery**
TOR	Tortoise Cave	3	sheep
LOT	Lotshitshi	3	cattle
PBA	Pearly Beach Area	3i	sheep
NAU	Nauga	1	-
KBE	Kasteelberg E	1	-
APL	Apollo Cave	1	-
SNR	Snake Rock Shelter	3i	sheep
DK1	Die Kelders	1	-
KBA	Kasteelberg A	3	sheep AMS
BPS	Boomplaas	4i	sheep
VSS	Vonk se Stahl	1	-
TOT1	Toteng 1	3	sheep and cattle AMS
OBP	Olieboomspoort	1	-
KSBD	!Khuseb Delta	1	-
OMU	Omungunda 99/1	5	-
KN54	KN2005/54	1	-
CLK	Clarke's Shelter	1	-
BJP	Biesje Poort	1	-
DIK	Dikbosch	3	sheep/goat?
KBJ	Kabeljous	3	sheep
KN12	KN2004/012	1	-
MIR	Mirabib	2	sheep hair and dung layer
JKKB	Jakkalsberg B	4	sheep
WIT	Witklip	3	sheep?
MES	Messum 1	5	-
BYN	Bynekranskop	3	sheep AMS
JUB	Jubilee	1	-
OVI	Ovizorombuku 96/1	1	-
BLY	Blydefontein	1	-
DK1	Die Kelders	1	-
SPR	Spoegrivier	3	sheep AMS
JP7	Jagt Pan 7	1	-
HAR	Hartman Valley	1	-
BES	Big Elephant Shelter	1	-
ORU	Orunwanje 95/1	1	-
KN41	KN2005/41	2	cattle AMS
BOK	Bokvasmaak	1	-
KWK	Klein Witkrans	1	-
LMR	Limerock	3ii	sheep/goat? (byre not directly associated to date)
HAA	Haaskraal	1	fibre from pot
ZIT	Zitundo	6	-
MAV	Mabveni	9i	cattle and sheep/goat
PHO	Phopo	6i	-
MAT	Matola IV	6	-
SIT	Situmpa	1	-
SIL	Silver Leaves	7i	-

Appendix 3

3.4.3. S3 Text. A chronological summary for the appearance of livestock and directly dated pottery at southern African sites for the period 550 BC to AD 1056**.**

SMF	Samfya Forest	6i	-
EIL	Eiland Salt Works	1i	-
CHO	Chowo River	7i	-
MZJ	Mzonjani	6i	-
MAU	Maunatlala	7i	-
KAM	Kamnama	6i	-
GZP1a	Great Zimbabwe	1i	-
NKP	Nkope Bay	9	cow tooth
ENK	Enkwazini	1i	-
RIA	Rian Rock Shelter	5	-
KLA	Klein Afrika	9	cattle and goat
UNC	University Campus	6i	-
NAMB	Namaso Bay	5i	-
HPR	Happy Rest	9i	cattle, sheep/goat, sheep and goat
KLF	Kalambo Falls	6i	-
IND	Inanda Quarry	6i	-
CHD	Chondwe	1	-
CIG	Cigwa	5	-
SAM	Samakande	6i	-
174	2931 CA174	1	-
GUN	Gundu	1i	-
KLD	Kalundu Mound	8i	cattle and sheep/goat
KAD	Kadzi	8	sheep, sheep/goat, goat (c.f.) and cattle
MON	Mondake	7	-
BAN	Banda	6i	-
KGG	KwaGandaganda	9ii	sheep, goat, sheep/goat, cattle and livestock byre
NMK	Namkala	5	-
MAM	Mamba	9ii	sheep, goat, sheep/goat, cattle and livestock byre
MGR	Magarape	7i	-
WOS	Wosi	9	sheep, sheep/goat, goat and cattle
LUM	Lumbi	6/9	sheep? and cattle?
SIM	Sioma Mission	6	-
CHA	Chalaka	1	-
LON	Lonze Forest	1	-
RIV	Riverside	3ii	cattle
KAMU	Kamukombe	3	sheep/goat
GOK	Gokomere	6i	-
LHC	Leopard Hill Cave	1	-
KMZ	Kumadzulo	9i	cattle
KAB	Kabondo Kambo	6i	-
MLP	Mhlopeni	9i	sheep and sheep/goat
BRD	Broederstroom	8i	sheep/goat and single cow bone
Ma38	Ma38	3	sheep/goat
KPW	Kapwirimbwe	9i	cattle
CAC	Castle Cavern	6	-
LYD	Lydenburg Head	9i	sheep, sheep/goat and cattle
LMH	Lumbule Hill	6i	-
KWC	Kwali Camp	9i	sheep and cattle
MSC	Msuluzi Confluence	9i	sheep, sheep/goat and cattle
MAK	Makwe	4i	cattle and goat
Tsh1	Tsh1	3	sheep/goat
KWC	Kwali Camp	9i	sheep and cattle
RUU2	Ruuga	6	charcoal from pottery
KAP	Kapako	1	surface find: charcoal extracted from pottery

Group 7: AD 655 – 855

Site ID and Site name	**Database Code**	**Livestock (conventional and AMS) and Direct date for pottery**

Appendix 3

3.4.3. S3 Text. A chronological summary for the appearance of livestock and directly dated pottery at southern African sites for the period 550 BC to AD 1056**.**

LMR	Limerock	3ii	sheep/goat? (byre not directly associated to date)
JKKB	Jakkalsberg B	4	sheep
WIT	Witklip	3	sheep
MES	Messum 1	5	-
BYN	Byneskranskop	3	sheep AMS
BES	Big Elephant Shelter	1	-
HAR	Hartman Valley	1	-
JP7	Jagt Pan 7	1	-
OVI	Ovizorombuku 96/1	1	-
DK1	Die Kelders	3	sheep AMS
SPR	Spoegrivier	3	sheep AMS
APL	Apollo Cave	1	-
KBE	Kasteelberg E	1	-
WEL	Welgeluk	1	-
JKKA	Jakkalsberg A	3	sheep
SBC	Steenberg Cove	3	sheep
OBP	Olieboomspoort	3	sheep/goat
LIK	Likoaeng	2	sheep AMS
BLNM	Balerno Main	1	-
ORU	Orunwanje 95/1	3	goat
BLY	Blydefontein	1	-
RSF	Roosfontein	1	-
KBC	Kasteelberg C	3	sheep
AB	Atlantic Beach	3i	sheep
SCO	Scott's Cave	2	sheep
BJP	Biesje Poort	1	-
WON	Wonderwerk	3	sheep/goat?
HAA	Haaskraal	1	fibre from pot
BIS	Bisoli	3	livestock present
MPM	Mpame	3	cattle?
TMB	Tambala	7i	-
MAG	Magogo	8i	sheep, sheep/goat and cattle
PLT	Plaston	1	-
CHO	Chowo River	6i	-
CHU	Chundu	4	cattle
LEB	Lebalelo	3i	sheep/goat
LPK	Leopard's Kopje	8ii	sheep/goat, cattle and livestock byre
TAU	Taukome	3ii	sheep/goat, cattle and livestock byre
MATL	Matlapaneng	8	sheep/goat, cattle and livestock byre
NTS	Ntsitsana	9ii	livestock present based on the presence of a byre
KAD	Kadzi	8	sheep, goat (c.f.) and cattle
NAN	Nanda	9i	sheep, sheep/goat, goat and cattle
NGA	Nanga	3	sheep/goat and cattle
MWE	Mwenezi	2	sheep and cattle
KMG	Kamangoza	5i	-
ZMF	Zambezi Farm	4i	cattle
BOS	Bosutswe	4ii	sheep, sheep/goat, goat, cattle and livestock byre
DIV	Divuyu	9i	sheep, sheep/goat, goat and cattle
IGI	Ingombe Ilede	8i	sheep/goat and cattle
KNO	Kanono Mulapo	1	dated charcoal from pottery
CHB	Chibuene	3	sheep, sheep/goat, goat and cattle
BRD	Broaderstroom	8ii	sheep/goat and cattle by association to a byre
KUL	Kulubele	1i	-
MGR	Magarape	7i	-
NDD	Ndondondwane	8ii	sheep, sheep/goat, goat, cattle and livestock byre
KANG	Kangonga	6i	-
SK17	SK17	3	sheep/goat and cattle
QOG	Qogana	1i	-
WOS	Wosi	9i	sheep, sheep/goat, goat and cattle

Appendix 3

3.4.3. S3 Text. A chronological summary for the appearance of livestock and directly dated pottery at southern African sites for the period 550 BC to AD 1056**.**

KLD	Kalundu Mound	8i	sheep/goat and cattle
KLF	Kalambo Falls	6i	-
DC19	2531DC19	1	OSL on pottery
DAM	Dambwa	6i	-
FIB	Fibobe	5i	-
NQM	Nqoma	4i	sheep, sheep/goat, goat and cattle
KGG	KwaGandaganda	9ii	sheep, sheep/goat, goat, cattle and livestock byre
RIA	Rian Rock Shelter	5	-
CHD	Chondwe	6i	-
174	2931 CA174	1	-
GUN	Gundu	1i	-
PHO	Phopo Hill	6i	-
NAMB	Namaso Bay	5i	-
KLA	Klein Afrika	9i	sheep/goat and cattle
LONF	Lonze Forest	1	-
MAT	Matola IV	6	-
GOK	Gokomere	6i	-
LHC	Leopard Hill Cave	1	-
UNC	University Campus	6i	-
NAM	Namkala	5	-
MAM	Mamba	9ii	sheep, sheep/goat, goat, cattle and livestock byre
MSC	Msuluzi Confluence	9i	sheep, sheep/goat, goat and cattle
BAN	Banda Hill	6i	-
LMH	Lumbule Hill	6i	-
KAB	Kabondo Kumbo	6i	-
LYD	Lydenburg Head	9i	sheep, sheep/goat and cattle
Tsh1	Tsh1	3	sheep/goat
SIM	Sioma Mission	6	-
DIA	Diamant	3ii	sheep/goat, cattle and livestock byre
RUU2	Ruuga 2(39)	6	-

Group 8: AD 856 – 1056

Site ID and Site Name		**Database Code**	**Livestock (conventional and AMS) and Direct date for pottery**
BJP	Biesje Poort	1	-
AUS	Australitz	1	-
BYL	Blydefontein	1	-
KN15	KN2004/015E	1	-
KFB	Kreeftebaai	1	-
KBA	Kasteelberg A	3	sheep and cattle
URU	Ururu	1	-
AB	Atlantic Beach	3	sheep
DSM	Drie Susters Main	3	sheep/goat and cattle
OVI	Ovizorombuku 96/1	1	-
BES	Big Elephant Shelter	3	sheep and cattle?
DOF	Doornfontein	1	-
KBB	Kasteelberg B	3	sheep and cattle
TOT3	Toteng 3	2	sheep AMS
OBP	Olieboomspoort	3	sheep/goat?
BKK	Blinkklipkop	3	sheep/goat?
KSBD	!Khuseb Delta	1	-
NBC	Nelson Bay Cave	3	sheep AMS
ORU	Orunwanje 95/1	3	sheep and goat
EBC	Elands Bay Cave	3	sheep
SPR	Spoegrivier	3	sheep AMS

Appendix 3

3.4.3. S3 Text. A chronological summary for the appearance of livestock and directly dated pottery at southern African sites for the period 550 BC to AD 1056**.**

KBC	Kasteelberg C	3	sheep
RSF	Roosfontein	1	-
GNE	Glen Elliot	1	fibre from pot
ZAY	Zaayfontein	1	fibre from pot
KKH	Klein Kliphuis	3	sheep
CAE	Cae Cae	9	cow
NAMB	Namaso Bay	5i	-
UNC	University Campus 6i	-	
MPM	Mpame	3	cattle?
NDN	Ndonde	1i	-
CHI	Chia Lagoon	1	-
TWK	Twickenham Road	9i	goat horn
NPL	Nakapapula	1	-
ISP	Isamu Pati	9i	sheep/goat and cattle
GUN	Gundu	1i	-
ZMF	Zambezi Farm	4i	cattle
KNO	Kanono Mulapa	1	charcoal from pot
KAB	Kabondo Kumbo	6i	-
KMG	Kamangoza	5i	-
CHO	Chowo River	10	-
RVS	Riverside	3ii	cattle, livestock byre
CHB	Chibuene	3	sheep, sheep/goat, goat and cattle
LUB	Lubusi	6	-
KLD	Kalundu Mound	8i	sheep/goat and cattle
CHD	Chondwe	6i	-
KGG	KwaGandaganda	9i	sheep, sheep/goat, goat and cattle
PTD	Pont Drift	3	sheep/goat and cattle
Le7a	Le7a	3	sheep/goat and cattle
KAD	Kadzi	8	sheep, sheep/goat, goat (c.f.) and cattle
LRY	Lanlory	6i	-
THD	Thandwe	1	-
TAF	Tafuna Hill	6i	-
NTKE	Ntshekane	9i	sheep, sheep/goat and cattle
SCH	Schroda	8i	sheep/goat and cattle
Le6	Le6	3	sheep/goat and cattle
SHO	Shongweni South	10	-
BOS	Bosutswe	4ii	sheep, sheep/goat, goat, cattle and livestock byre
NQM	Nqoma	8i	sheep, sheep/goat and cattle
KZ1	Kazindu	6	-
MAM	Mamba	9ii	sheep, sheep/goat, goat, cattle and livestock byre
NDD	Ndondondwane	8ii	sheep, sheep/goat, goat, cattle and livestock byre
MAG	Magogo	8i	sheep, sheep/goat and cattle
DOM	Dombashaba	1	-
MWE	Mwenezi	2	sheep, sheep/goat, goat and cattle
NGA	Nanga	3	sheep/goat and cattle
NAN	Nanda	9i	sheep, sheep/goat, goat and cattle
MATL	Matlapaneng	8	sheep/goat and cattle
TAU	Taukome	3ii	sheep/goat, cattle and livestock byre
LPK	Leopards Kopje	8ii	sheep/goat, cattle and livestock byre
LEB	Lebabelo	3i	sheep/goat
CHU	Chundu	4	cattle
PLT	Plaston	1	-
SK17	SK17	3	sheep/goat and cattle
DIA	Diamant	3ii	sheep/goat, cattle and livestock byre
IGI	Ingombe Ilede	8i	sheep/goat and cattle
KAP	Kapako	6i	-

Appendix 4

4.1 Supporting information for 'A southern African archaeological database of organic containers and materials, 800 cal BC to cal AD1500: Possible implications for the transition from foraging to livestock-keeping.'

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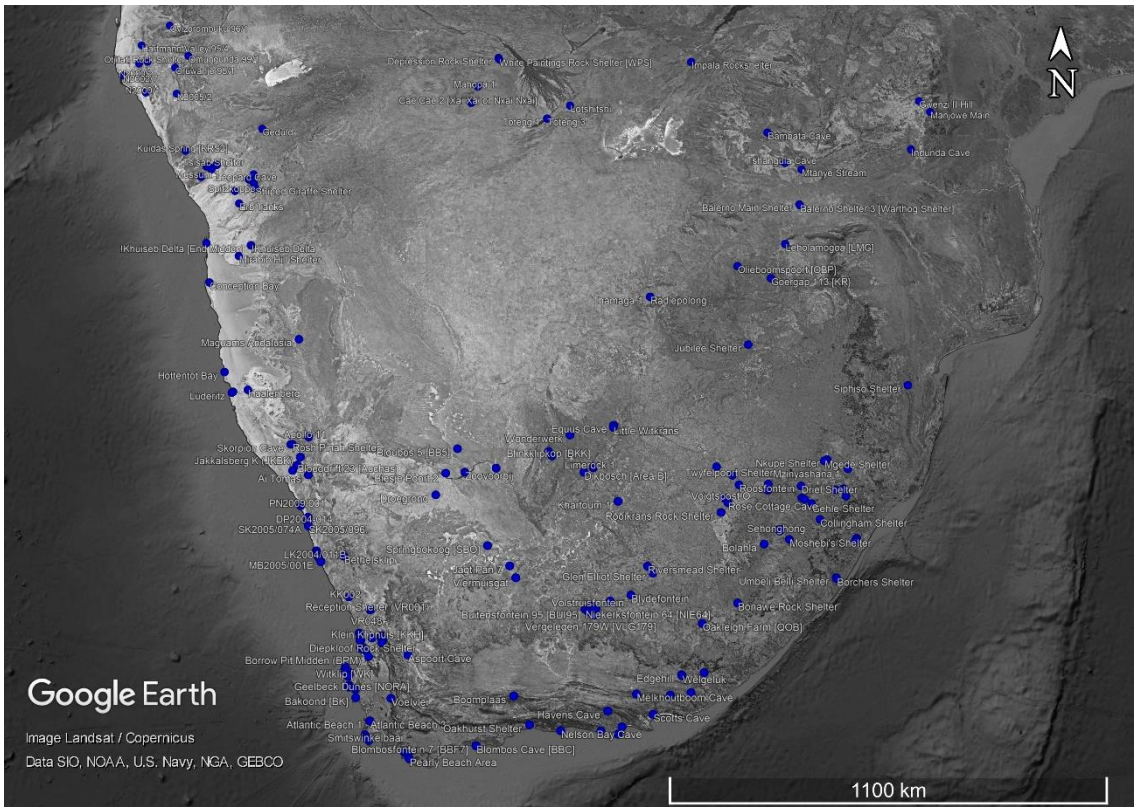
4.8 S4 Appendix. Haaskraal (221) and Die Kelders (294). Examples of fibre-tempered and mineral tempered pottery, twine and ostrich eggshell photographed during museum collection visits, 2017**.**.....613

Appendix 4

4.2 S1 Map. KMZ file to show the temporal and geographic spread of the data contained within Database 1



Link: https://doi.org/10.1371/journal.pone.0235226.s001

Appendix 4

4.3.1. S1 Table. The sources used in the compilation of Database 1.

Publication Source	Number of published reports
The South African Archaeological Bulletin	52
Southern African Humanities (earlier name of journal: Annals of the Natal Museum)	27
South African Field Archaeology	10
Cimbebasia	7
African Archaeological Review	7
Journal of Archaeological Science	6
Radiocarbon	5
Before Farming	4
Journal of African Archaeology	4
Botswana Notes and Records	4
South African Journal of Science	3
Researches of the National Museum, Bloemfontein.	3
Journal of Island and Coastal Archaeology	2
Journal of Arid Environments	2
South African Archaeological Society: Goodwin Series	2
Annals of the South African Museum	2
Antiquity	2
Archaeometry	1
Paleo Anthropology	1
Plos One	1
Nyame Akuma	1
Annals of the Eastern Cape Museum	1
Annals of the Ditsong National Museum of Natural History	1
Journal of Anthropological Archaeology	1
World Archaeology	1
Azania: Archaeological Research in Africa	1
Pula: Botswana Journal of African Studies	1
Current Anthropology (Curr Anthropol.)	1
Madoqua	1
Science	1
South African History Journal	1
Zimbabwea	1
Books	6
Edited Books	5
Unpublished University dissertations or theses	13
Monographs	16
Unpublished Government Reports	1

Appendix 4

4.3.2. S2 Table: A list of six sites, their organic and pottery assemblages and associated dates that were recorded at South African Museums.

Site reference Number (Database 1)	*Site and region*	*uncal. radiocarbon date*	*Items selected for further documentation*	*National Repository and Museum Site Accession**
165	**Spoegrivier** Namaqualand, Northern Cape, South Africa.	1450±50 Pta-6750 1250±50 GrA-9027 1490±50 GrA-9030 1890±50 GrA-9029 1900±50 GrA-9032 1900±50 GrA-9028 1930±50 Pta-6749 2105±65	• Ostrich eggshell containers • Twine • Mineral-tempered pottery.	McGregor Museum, Kimberley, Northern Cape, South Africa. Museum Site Accession: Spoeg River (LE. W).
169, 170	**Jakkalsberg A and B** Richtersveld, Northern Cape, South Africa.	1420±25 Pta-6122 1380±50 Pta-6101 1330±60 Pta-5958 1300±25 Pta-6100	• Lugged mineral-tempered pottery.	McGregor Museum, Kimberley, Northern Cape, South Africa. Museum Site Accession: Jakkalsberg A & B (Cultural).
235	**Blinkklipkop** Kuruman Hills, Northern Cape, South Africa.	1160±50 Pta-2840 1150±40 Pta-2835	• Ostrich eggshell containers. • Mineral-tempered pottery.	McGregor Museum, Kimberley, Northern Cape, South Africa. Museum Site Accession: BKK 6549.
236	**Dikbosch 1 & 2** Ghaap Escarpment, Northern Cape, South Africa.	1720±40 Pta-3413 1570±40 Pta-3412	• Ostrich eggshell containers. • Mineral-tempered pottery.	McGregor Museum, Kimberley, Northern Cape, South Africa. Museum Site Accession: DIK 6480.

Appendix 4

4.3.2. S2 Table: A list of six sites, their organic and pottery assemblages and associated dates that were recorded at South African Museums.

221	**Haaskraal (HAA)** Karoo, Northern Cape, South Africa.	1570±50 GrA-13542 1400±50 GrA-13540 1180±70 SMU-1789 1140±60 SMU-1790 545±45 SMU-1636 544±43 SMU-1636	• Ostrich eggshell containers. • Lugged mineral-tempered pottery and grass-tempered pottery.	Iziko South African Museum, Cape Town, South Africa. Museum Site Accession: SAM-AA-9099.
294	**Die Kelders (DK1)** southern Cape, South Africa.	1960±85 GX-1688 1960±85 GX-1687 1325±60 OxA-3860 1290±60 OxA-3961	• Ostrich eggshell containers. • Marine Shell bowl with ochre. • Mineral-tempered pottery.	Iziko South African Museum, Cape Town, South Africa. Museum Site Accession: SAM-AA-8725.

Appendix 4

4.3.3. S3 Table. Historic and ethnographic accounts of the use of containers in southern Africa, 16th century AD to the present.

Southern African	Number of accounts	Dates captured
Nama	9	1806-1956
Damara	1	1834
G|ana and G‖wi	2	1959-60s, 1993
Nharo	2	1930, 1968-83
Auen	1	1930
Ju'|'hoansi (!Kung)	3	1914-19, 1930-61
ǂAuin	3	1908-1911
Kxoé	1	1911-1990s
Cape Khoe*	11	1617-1713, 1770-79
|Xam* southern San	8	1704-1812, 1938
Koranna*	3	1801 – 1820
Herero	5	1884-87, 1967, 1974
Himba	3	1967-86, 1991
Gonaqua*	4	1772-82, 1829
!Xhosa	12	1593, 1777-1855, 1932,
Mpondo	5	1782, 1899, 1949-74
Bomvana	2	1931, 1974
Baca	1	1974
Thembu	4	1825-34, 1974
Hlubi	1	1974
Amazizi	1	1824
Xesibe	1	1974
Zulu	3	1900, 1981, 2018
Swazi	3	1930, 1959-81
24	**89**	**1593 - 2018**

Appendix 4
4.4 S1 Appendix. Database 1
4.4.1. Map 1: 891 – 291 cal BC

Key:
Nq = quantity is not reported in published excavation report.
? = identification is not certain
F = site and/or radiocarbon determination has been filtered from map
Bold = Direct date

Site Reference Number	***Site Name*** ***Type of site*** ***Region*** ***Source***	***Co-ordinates***	***Affiliation***	***Stratigraphic Context***	***uncal. Radiocarbon date [BP]***	***Material Dated***	***Cal. Radiocarbon date***	***Date*** ***Grade***	***Ostrich eggshell flask and or decorated pieces description.***	***Ostrich eggshell bead data [quantity, mean diameter, and manufacturing]***	***Other organic Material recovered at site***
2	**Oruwanje 95/1** inland rock shelter site Namibia **[2, 3]**	-18,30513056S 13,44698889E	LSA	7/10c/-160	2527±27 [KIA-29258]	charcoal	762-542BC	**2**	0	**N112**, manufacturing present at site.	0
5	**Ovizorombuku 96/1** large rock shelter Namibia **[2]**	-17,04309444S 13,21597222E	LSA	12/26b/+105	2465±35 [KN-5261]	charcoal	728-409BC	**2**	0	**N3**, 5.0±0.7mm, manufacturing absent.	0
				12/26b/+110	2435±45 [KN-5325]	charcoal	702-399BC				
8	**Omungunda 99/1** large rock shelter Namibia	-18,02492222S 13,78665278E	LSA	3/3c/-155	2600±35 [KN-5674]	charcoal	802-590BC	**2**	0	few beads, mean of 6mm, manufacturing absent.	0
				4/4b/-155	2511±37 [KIA-22462]	charcoal	755-515BC				
				3/3a/-145	2345±35	charcoal	406-263BC				

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	[2]				[KN-5675]						
				3/3b/-145	2242±23 [KIA-24949]	charcoal	356-206BC				
14	**Fackelträger** rock shelter Namibia **[4]**	-21,56666667S 15,53333333E	LSA	28-36cm	2740±45 [KN-461]	charcoal	895-810BC	**3**	1 complete ostrich egg worked into a container. 1engraved fragment. [association with date not secure].	A fair number of beads. Not reported in its entirety.	0
				9-11cm	2730±45 [KN-460]	charcoal	895-805BC				
				5-15cm	2190±40 [KN-I.732]	charcoal	350-113BC				
				10-25cm	2150±60 [KN-I.731.]	charcoal	337-56BC				
25	**Messum 1** rock shelter Namibia **[5, 6]**	-21,36666667S 14,28333333E	LSA	21-24cm	2820±55 [KN-I.638]	charcoal	997-846BC	**2**	0	A few numbers of beads. Not reported in its entirety	0
31	**Big Elephant Shelter**	-21,68333333S	LSA	Light Brown Soil and	2600±50	charcoal	803-556BC	**3**	0		0

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	inland rock shelter Namibia **[7]**	15,66666667E		Brown Soil with plant layer	[Pta-1556]					**N151**, small, minimal evidence for manufacturing at site.	
				surface from area	2550±80 [UCLA-724A]		789-540BC				
33	**Leopard Cave** cave site Namibia **[8]**	-21,57277778S 15,555E	LSA	Layer 6	**2430±50** **[Beta-236963]**	**charcoal**	727-397BC	**2**	0	**N16**, 4.74±0.43mm, manufacturing present on site.	0
37	**Geduld** rock shelter Namibia	-20,28333333S 15,83333333E	LSA	Level 13, sq. C7	2300±50 [Pta-5872]	charcoal	395-230BC	**3**	0	**N13**, 4.6±0.8mm, manufacturing not reported for site.	0

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	[10, 11]										
58	**Kuidas Spring [KRS2]** small rock shelter Namibia **[12, 13**	-20,63175S 13,84638889E	LSA	Brown III	**2264±27** **[OxA-27894]**	**charcoal**	363-211BC	**2** **Grade**	0	**N141** [1 bead shows ochre staining], 4.1±0.84mm, manufacturing present on site.	0
76	**Amis 10** inland rock shelter Namibia **[16]**	-21,11928333S 14,47323611E	LSA	-	2760±50 [KN-3544]	-	906-815BC	**2**	0	**N337** [total at site], manufacturing present at site.	0
					2710±60 [KN-4117]	-	896-797BC				
79	**Amis 17** inland rock shelter	-21,11928333S 14,47323611E	LSA	70-75cm	2680±50 [KN-4066]	-	892-776BC	**2**	0	**N13,** 5mm, manufacturing present at site.	0
				75-80cm	2400±55 [KN-4065]	-	539-377BC				

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	Namibia **[16]**										
98	**Cae Cae 2 [Xai Xai or Nxai Nxai]** inland open-air pan site Botswana **[17]**	-19,93454444S 21,07823889E	LSA	Unit II, level 17, 18	2165±50	charcoal	335-66BC	**3**	0	ostrich eggshell present but not reported in its entirety.	0
				Unit II, level 15, 16	2260±65	charcoal	370-206BC				
105	**Tshangula Cave** inland cave site Zimbabwe **[18, 19]**	-21,27279167S 28,83740278E	LSA	Level 1	2150±100 [SR-75]	charcoal	353BC-AD14	**3**	0	nq [some beads coated in red ochre].	0
107	**Impala Rockshelter**	-18,73851944S	LSA	Test Unit 1 [50cm depth]	**2310±40**	**charred wood**	397-236BC	**3**	0	**N624** [total at site], manufacturing present at site.	0

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Site Reference Number	***Site Name*** ***Type of site*** ***Region*** ***Source***	***Co-ordinates***	***Affiliation***	***Stratigraphic Context***	***uncal. Radiocarbon date [BP]***	***Material Dated***	***Cal. Radiocarbon date***	***Date*** ***Grade***	***Ostrich eggshell flask and or decorated pieces description.***	***Ostrich eggshell bead data [quantity, mean diameter, and manufacturing]***	***Other organic Material recovered at site***
	inland rock shelter Zimbabwe **[20]**	26,52071111E			**[Beta-23182]**						
122	**Seal Midden MB2005 -005** open-air shell midden Northern Cape **[21]**	-30,46830556S 17,36005556E	LSA	Occupation 2 005A base of midden	2620±70 [GX-32525]	marine shell	330-55BC	**3**	8 undecorated ostrich eggshell container rim fragments [total at site].	**N5**, 3.3±1.1mm, manufacturing absent.	0
134	**KN2005/135A** small in-situ coastal shell-midden Northern Cape	-30,23486111S 17,248E	LSA	K23 top	**2523±27** **[OxA-22924]**	**bone**	757-542BC	**3**	0	**N4,** 4.88±0.39mm, manufacturing absent.	0

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Site Reference Number	*Site Name* *Type of site* *Region* *Source*	*Co-ordinates*	*Affiliation*	*Stratigraphic Context*	*uncal. Radiocarbon date [BP]*	*Material Dated*	*Cal. Radiocarbon date*	*Date* *Grade*	*Ostrich eggshell flask and or decorated pieces description.*	*Ostrich eggshell bead data [quantity, mean diameter, and manufacturing]*	*Other organic Material recovered at site*
	[22]										
138	**MB2005/001E** coastal open-air sites Northern Cape **[22]**	-30,46872222S 17,36072222E	LSA	Layer 2 (A39 eigth layer)	**2796±27** **[OXA-24554]**	**bone**	924-840BC	**2**	0	**N3**, 4.35±1.38mm, manufacturing absent.	0
				Layer 1 (A39 -second layer)	**2190±27** **[Oxa-24552]**	**bone**	348-139BC				
					2176±27 **[OxA-24553]**	**bone**	336-111BC				
142	**PN2009/001** deflated coastal shell midden Northern Cape **[22]**	-29,24627778S 16,87436111E	LSA	I64	2670±30 [UGAMS-6607]	marine shell	357-140BC	**3**	3 undecorated ostrich eggshell container rim fragments. 17 engraved pieces [parallel lines and 'ladder' designs.]	**N36**, 4.22±0.50mm, manufacturing present.	0
150	**SK2005/096.**	-29,68886111S 17,06427778E	LSA	Patch B	2740±25 [UGAMS-8871]	marine shell	414-184BC	**2**	0	**N1**, 3.62mm, manufacturing absent.	0

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	coastal in situ shell midden Northern Cape **[22]**										
158	**Reception Shelter (VR001)** small coastal cave site Western Cape **[22]**	-31,526S 18,60111111E	LSA	Layer 9B Layer 7 (top)	2560±49 [AA-89910] **2578±25** **[OxA-22983]**	bone **charcoal**	789-546BC 793-571BC	**2**	0	**N10**, 4.27±0.47mm, manufacturing absent.	0
165	**Spoegrivier** coastal cave site Northern Cape	-30,28333333S 17,26666667E	LSA	Layer 10 SAS (sq.C6) Pre-pottery	2400±25 [Pta-7200]	charcoal	478-390BC	**2**	0	**N39**, 4.2mm, manufacturing present.	0

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	[23, 24]										
185	**Zoovoorbij** inland cave site Northern Cape **[26]**	-28,645S 20,97833333E	LSA	level III, sq. B1	2800±60 [Pta-2870]	charcoal	976-830BC	**3**	1 engraved piece [incised] [total at site].	**N5** [total at site], manufacturing not reported.	0
189	**Jagt Pan 7** inland oval shaped stone feature site Northern Cape **[27, 28]**	-30,65928333S 22,08681667E	LSA	Spit 3 - 4	2550±60 [Pta-4193]	oes	AD787-542	**3**	4 undecorated ostrich eggshell container rim pieces [context not provided].	**N2** [unfinished], manufacturing present.	0
				Spit 2	2360±60 [Pta-4309]	oes	486-235BC				
219	**Blydefontein** inland rock shelter site	-31,25S 25,1E	LSA	GAC/CAU3	**2728±32** **[D-AMS-1231]**	**bone**	893-805BC	**2**	0	**nq** [18 beads total at site] , 4.8mm, manufacturing not reported for site.	0
				GAC/C50	2292±117 [SMU-1853]	charcoal	415-109BC				

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	Northern Cape **[29, 30, 31, 32]**										
224	**Riversmead Shelter** inland rock shelter Northern Cape **[33]**	-30,63333333S 25,5E	LSA	Level IX	2530±105 [GX-0724]	charcoal	778-492BC	**3**	0	**N2**, 3.9mm, manufacturing not reported for site.	0
228	**Springbokoog [SBO]** 5 surface scatters Northern Cape **[34]**	-30,22770556S 14.12E	LSA	SBO15/spit 1	2710±50 [Pta-4664]	oes	894-798BC	**3**	decorated ostrich eggshell fragments.	Beads not reported for site.	0
				SBO5/excavated surface	2630±50 [Pta-4205]	oes	AD822-590BC				
				SBO15/spit 1	2520±60 [Pta-4653]	oes	764-522BC				
243	**Pancho's Kitchen Midden**	-32,33944444S	LSA [mega-midden]	Layer 3	2640±60	charcoal	835-264BC	**2**	0	**N4**, manufacturing absent.	0

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	small rocky overhang site Western Cape **[35]**	18,33333333E			[Pta-5602]						
244	**Mike's Taylor Midden** coastal shell midden/mound [mega-midden]/camp site Western Cape **[36]**	-32,335S 18,31666667E	LSA [mega-midden]	Spit 12, sq. E5	2820±50 [Pta-3720]	charcoal	996-846BC	**2**	0	**N3** [total at site], manufacturing absent.	0
				Spit 10, sq. E3	2460±50 [Pta-3207]	charcoal	731-406BC				
				Unit CAN, sq. E1	2270±25 [Pta-7013]	marine shell	368-213BC				
				DGM, sq. E9	2340±60 [Pta-6693]	marine shell	412-213BC				
				BARN3, sq. E9	2220±60 [Pta-6694]	marine shell	357-152BC				
255	**Deurspring 16 [DSP16]**	-32,01333333S 18,29549167E	LSA	Layer 1 [Unit ML sq. KII 50 - 120mm depth]	2760±45 [Pta-7129]	marine shell	905-817BC	**2**	0	N0.8, unfinished bead.	0

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	coastal open shell midden Western Cape **[38]**										
258a	**Steenbokfontein** coastal cave site Western Cape **[39, 40]**	-32,16166667S 18,33333333E	LSA	layer 3 [bottom]	2690±60 [Pta-6134]	charcoal	895-788BC	**2**	1 undecorated ostrich eggshell container rim fragment and 4decorated pieces.	**N38**, unfinished beads present. Manufacturing present.	0
				layer 3 [top]	2490±50 [Pta-6505]	twigs	747-415BC				
				Layer 2	2360±45 [Pta-6498]	Micro-fauna	473-256BC				
258b	**SAM-AP 6314** coast burial Western Cape **[41, 42]**	-32,13583333S 18,30805556E	LSA	burial	**2445±50** **[OxA-6219]**	**human bone**	728-402BC	**1**	0	0	twine in direct association with burial

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273	**Blombosfontein 7 [BBF7]** open-air shell midden Western Cape **[44]**	-34,41508333S 21,22003611E	LSA	Unit 7/4HL3, sq. B2	3170±25 [Pta-6183]	shell	950-766BC	**2**	0	**N53**, less than 5mm, manufacturing present on site.	0
				Unit 7/1YSL, sq. B2	3110±50 [Pta-6179]	shell	917-664BC				
277d	**Geelbeck Dunes [SHELLY]** coastal open scatter sites Western Cape **[45]**	-33,18864722S 18,15891667E	LSA [mega-midden]	SHELLY1	**2465±25** **[KIA-17757]**	**small oes bead**	702-410BC	**1**	0	**N220**, small, manufacturing present.	0
277e	**Geelbeck Dunes [POTTERY]** coastal open scatter sites	-33,18864722S 18,15891667E	LSA [mega-midden]	POTTERY1	**2500±25** **[KIA-17761]**	**OES small bead**	750-486BC	**2**	0	**N614**, small, manufacturing present.	0

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	Western Cape **[45]**										
277f	**Geelbeck Dunes [NORA]** coastal open scatter sites Western Cape **[45]**	-33,18864722S 18,15891667E	LSA [mega-midden]	NORA1	**2580±25** **[KIA-17755]**	**OES small bead preform**	794-572BC	**2**	0	**N187**, small, manufacturing present on site.	0
277g	**SAM-AP 6031** coastal burial site Western Cape **[42]**	-33,17722222S 17,96555556E	LSA	burial	2560±50 [Pta-4814]	human bone	792-544BC	**2**	0	0	string

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279	**Bakoond [BK]** coastal shell midden site Western Cape **[46]**	-33,36502222S 18,16476944E	LSA [mega-midden]	BK I, Spit 1, sq. F9	2800±30 [UGAMS-3064]	marine shell	532-260BC	**3**	0	**N4**, 4.73mm, manufacturing absent.	0
302a	**Elands Bay Cave** coastal cave site Western Cape **[47]**	-32,31001944S 18,35200278E	LSA	LARM, sq. E9	2190±25 [Pta-5820]	charcoal	347-141BC	**2**	0	**nq**, beads are small and conform to 4 -4.5mm in external diameter.	string and grass bedding [*Zostera capensis*]
311	**Klasies River Cave 1 [KRM1]** coastal cave site	-34,1S 24,4E	LSA	upper Unit (LSA II)	2795±85 [GX-0971]	charcoal	996-819BC	**2**	0	**N1**, manufacturing absent.	0
				Upper Unit (LSA II)	2525±85 [GX-0969]	charcoal	795-544BC				

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	Eastern Cape **[50]**										
313	**Melkhoutboom Cave** cave site Eastern Cape **[51]**	-33,31666667S 25,28333333E	LSA	Cut Away Frontal Unit [CAF]	2870±90 [Pta-706]	charcoal	1118-856BC	**2**	0	**N11**, manufacturing present.	0
316	**Nelson Bay Cave** large coastal cave site and human burial Western Cape **[52, 53, 54]**	-34,10277778S 23,375E	LSA	UCT346, human burial (Unit 49, Unit 43 and Unit 31)	Between 3020±35 [Pta-2920] 2970±60 [Pta-2913] and **2925±35** **[GrN-5702]**	charcoal	1126-998BC [limit of database capturing of dates]	**2**	0	**N252** [assoc. grave good].	0
322	**Bonawe Rock Shelter**	-31,34361111S 27,775E	LSA	Layer 1b [0.37m depth]	2250±80 [Pta-1711]	charcoal	381-165BC	**3**	0	**N1**, manufacturing absent.	0

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	inland rock shelter Eastern Cape **[55]**										
357	**Umhlatuzana Rock Shelter** inland rock shelter KwaZulu-Natal **[56]**	-29,80777778S 30,75611111E	LSA	Layer 3 (FBSA)	2840±60 [Pta-4215]	charcoal	1091-846BC	**2**	0	**N5,** manufacturing not reported for site.	0
334	**Rose Cottage Cave** inland rock shelter Free State	-29,21666667S 27,46666667E	LSA	Layer A2	2240±60 [Pta-7117]	charcoal	362-201BC	**2**	1 decorated ostrich eggshell piece ['ladder' design.]	**N17**, manufacturing present at site.	0

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	[57]										
349	**Nkupe Shelter** inland rock shelter KwaZulu-Nata **[58]**l	-28,14666667S 29,93666667E	LSA	Layer 3 (WA1H)	2480±60 [Pta-3443]	charcoal	747-410BC	**2**	0	**N31**, 4.87±0.76mm, manufacturing absent.	twine
351	**Mhlwazini Cave** inland rock shelter KwaZulu-Natal **[59]**	-29,04777778S 29,38972222E	LSA	Layer 6 (SOBS)	2570±60 [Pta-5045]	charcoal	795-544BC	**2**	0	**N7,** manufacturing absent.	0
				Layer 5 (AOBS)	2280±50 [Pta-4868]	charcoal	383-211BC				
355	**Mzinyashana 1** inland rock shelter	-28,31416667S 30,47222222E	LSA	Layer 6	2260±50 [Pta-6542]	charcoal	366-208BC	**2**	0	**N1**, [ochre stained], manufacturing absent.	0

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	KwaZulu-Natal **[60]**										
374	**Balerno Shelter 3 [Warthog Shelter]** small inland rock shelter Limpopo **[61]**	-22,28694444S 29,20361111E	LSA	Unit AG3 sq. G7	2250±40 [Pta-7994]	charcoal	359-207BC	**2**	0	**N2**, minimal evidence for manufacturing.	0
375	**Balerno Main Shelter** inland rock shelter Limpopo **[62]**	-22,265S 29,18805556E	LSA	DBG Hearth	2180±50 [Pta-8609]	charcoal	349-73BC	**2**	0	**N57**, evidence for manufacturing.	0
391	**Liphofung**	-28,90069167S	LSA	layer 2 [DBS]	2700±60	bone	895-793BC	**2**	0	**N3**, manufacturing absent.	0

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	large inland rock shelter Lesotho **[64]**	28,46162222E			[Pta-6106]						
394	**Moshebi's Shelter** inland rock shelter Lesotho **[65]**	-29,93333333S 29,03333333E	LSA	Spit 3	2200±25 [UGAMS-11589]	charcoal	350-147BC	**2**	0	**N2**, manufacturing absent	0
405	**SAM-AP 5075** rock shelter burial site Western Cape	-34,14527778S 18,37416667E	LSA	burial	2530±60 [Pta-4669]	human	768-540BC	**2**	0	0	string

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	[42]										
406	**SAM-AP 1449** inland small rock shelter burial Western Cape **[42]**	-32,17861111S 18,89083333E	LSA	burial	**2330±100** **[OxA-453]**	**human bone**	507-202BC	**1**	0	0	twine and animal skin
1	**Erb Tanks** inland rock shelter Namibia **[1]**	-22,15160833S 15,298275E	LSA	level 15	**2590±25**	**oes [AMS]**	798-591BC	**F**	0	manufacturing present	0
35	**Spitzkoppe** rock shelter	-21,82341111S 15,17828333E	LSA	Unit 6: Coarse Burnt Samd [0.3m]	2600±45 [Pta-4652]	charcoal	803-560BC	**F**	0	No ostrich eggshell beads were recovered.	0

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	Namibia **[9]**										
66	**Tsisab Shelter** inland rock shelter Namibia **[14]**	-21,1S 14,68333333E	LSA	Hearth, Sq. C5 [10cm depth]	2240±50 [Pta-1546]	charcoal	358-204BC	**F**	0	not reported in its entirety.	0
67	**Girl's School Shelter** inland large boulder shelter Namibia **[14, 15]**	-21,1S 14,68333333E	LSA	Sq. C, Spit 3 [17-22cm depth]	2780±60 [Pta-1776]	charcoal	968-816BC	**F**	0	not reported in its entirety.	0
117	**KV502**	-29,50083333S 17,05522222E	LSA	-	2940±45 [Pta-9306]	marine shell	728-472BC	**F**	0	No beads reported with only ostrich eggshell fragments present.	0

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	small open-air site of a cluster of shell middens, coastal Northern Cape **[21]**										
120	**LK2001-013 or LK5-1** open-air coastal shell midden**.** Northern Cape **[21]**	-30,37763889S 17,30844444E	LSA	East Patch	2870±60 [Pta-9312]	marine shell	656-372BC	**F**	0	No beads reported with only ostrich eggshell fragments present.	0
128	**KN2005/040** dense deflated shell and artefact scatter, coastal	-30,23494444S 17,24983333E	LSA	K12 surface	**2695±26** **[OxA-22971]**	**bone**	833-798BC	**F**	0	**N5**, 4.81±0.56mm, manufacturing absent.	0

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	Northern Cape **[22]**										
247	**Grootrif G [GFG]** coastal shell midden/mound [mega-midden] Western Cape **[37]**	-32,16666667S 18,31222222E	LSA [mega-midden]	Layer 3 [mega-midden Lens]	2380±60 [Pta-4055]	charcoal	537-264BC	**F**	0	no ostrich eggshell.	0
260	**Grootrif B** large coastal open shell midden Western Cape **[40]**	-32,16666667S 18,31222222E	LSA [mega-midden]	Sample E test pit	2700±60 [Pta-4068]	charcoal	895-793BC	**F**	0	not analyzed	0
				Sample D test pit	2620±50 [Pta-4067]	marine shell	812-570BC				
				Sample B test pit	2320±70 [Pta-4098]	charcoal	405-211BC				
				Sample A test pit	2190±60 [Pta-4081]	charcoal	352-107BC				

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Site Reference Number	*Site Name* *Type of site* *Region* *Source*	*Co-ordinates*	*Affiliation*	*Stratigraphic Context*	*uncal. Radiocarbon date [BP]*	*Material Dated*	*Cal. Radiocarbon date*	*Date* *Grade*	*Ostrich eggshell flask and or decorated pieces description.*	*Ostrich eggshell bead data [quantity, mean diameter, and manufacturing]*	*Other organic Material recovered at site*
261	**Grootrif D** large coastal open shell midden Western Cape **[40]**	-32,16666667S 18,31222222E	LSA [mega-midden]	Unit 8 test pit	2540±50 [Pta-4083]	charcoal	773-542BC	**F**	0	not analyzed	0
				Unit 4 test pit	2470±60 [Pta-4085]	charcoal	744-406BC				
				Unit 1 test pit	2290±50 [Pta-4075]	charcoal	391-213BC				
262	**Cape Deseada Midden** large coastal open shell midden Western Cape **[40]**	-32,31666667S 18,31388889E	LSA [mega-midden]	shell lens 2 [test pit 2]	2500±50 [Pta-5919]	marine shell	752-434BC	**F**	0	ostrich eggshell not reported.	0
				shell lens 2 [test pit 1]	2450±50 [Pta-5918]	marine shell	729-403BC				
263	**Railway Midden** coastal mega-midden	-32,33333333S 18,31833333E	LSA [mega-midden]	lens [test pit 1]	2450±50 [Pta-5917]	marine shell	729-403BC	**F**	0	ostrich eggshell not reported	0
				lens [test pit 2]	2400±40 [Pta-3916]	marine shell	535-381BC				

Appendix 4
4.4 S1 Appendix. Database 1
4.4.1. Map 1: 891 – 291 cal BC

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	Western Cape **[40]**										
266	**Public Resort** coastal shell midden Western Cape **[43]**	-32,330125S 24.5E	LSA [mega-midden]	Sounding	2610±50 [Pta-4040]	marine shell	807-559BC	**F**	0	ostrich eggshell not reported	0
					2570±60 [Pta-4022]	charcoal	795-544BC				
306b	**Kablejous River Mouth 2B [KR/SM2B]** coastal open-air shell midden Eastern Cape **[48, 49]**	-34,00565278S 24,93393611E	Kabeljous	layer 2B	2570±60 [Pta-3907]	charcoal	795-544BC	**F**	0	no ostrich eggshell recovered.	0
308a	**Goedgeloof C1/M1**	-34,15951389S	Kabeljous	skeleton	2890±60	marine shell	545-366BC	**F**	0	no ostrich eggshell recovered.	0

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	coastal open-air shell midden Eastern Cape **[48, 49]**	24,75613056E			[Pta-4066]						
376	**Olieboomspoort [OBP]** large inland rock shelter Limpopo **[63]**	-23,87833333S 27,63805556E	LSA	Layer 10, sq. D5	2350±40 [Pta-8429]	charcoal	410-257BC	**F**	0	**N746**, many ochre stained beads, manufacturing present.	0
				Layer 10, sq. D5	2280±35 [Pta-8400]	charcoal	381-214BC				
				Layer 10, sq. C4	2230±15 [Pta-8408]	seeds	352-205BC				
				Layer 10, sq. C4	2180±40 [Pta-8405]	charcoal	348-102BC				
141	**MB2005/059** deflated coastal shell scatter	-30,46422222S 17,36116667E	LSA	Patch A	**2641±29** **[OxA-24556]**	**bone**	809-774BC	**F**	2 undecorated ostrich eggshell container rim fragments.	No ostrich eggshell beads were recovered.	0

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	Northern Cape **[22]**										
171	**Equus Cave** inland cave site Northern Cape **[25]**	-27,61666667S 24,63333333E	LSA	Spit 4 (Stratum 1A, sq. 21K)	2390±55 [Pta-2452]	ostrich eggshell	536-366BC	**F**	0	No beads reported with only ostrich eggshell fragments present.	0

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4.4 S1 Appendix. Database 1
4.4.2. Map 2: 290 cal BC – cal AD 310

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2	**Oruwanje 95/1** inland rock shelter site Namibia **[2, 3]**	-18,30513056S 13,44698889E	unknown [LSA groups]	Early Phase Pottery LSA	2243±39 [UtC-5944] 1950±35 [KN-5303] 1939±50 [KN-4848] 1907±27 [KN-5003] 1900±40 [KN-5302]	charcoal samples	357-206BC AD49-195 AD50-203 AD116-205 AD116-216	**2**	0	**nq**, 4.88±0.87mm, manufacturing present at site.	0	Pottery is rare and may possibly not be associated with early radiocarbon reading. The pottery is significantly thinner at 5.0mm sherd thickness. High number of grey and red sherds. Mica and grog used as a temper along with the presence of quartz temper. 2 decorated pieces [1 with horizontal grooves, 1 with herringbone pattern]. **[17 sherds]**	sheep, goat [nq] [?]. Left out of mapping exercise as query as to whether this is domestic sheep/goat.
				Phase 3: Middle Ceramic	1731±43 [KN-4850]	charcoal	AD255-409			**nq**, 6.0±1.6mm, manufacturing present at site.		First appearance of ripple rim pottery: Typical feature of sherds is that they appear brown or ochre in colour. Mean sherd thickness is 5.7mm with quartz grit temper. 2 sherds decorated with incised grooves. 1 'Ripple Rim' present. **[15 sherds]**	
8	**Omungunda 99/1** large rock shelter Namibia **[2]**	-18,02492222S 13,78665278E	unknown [LSA groups]	Early Phase Pottery LSA	1956±31 [KIA16043] 940±22 [KIA16045] 1842±25 [KIA11982] 1835±30 [KIA11982] 1810±35 [KN5639]	charcoal samples	AD50-124 AD70-125 AD147-248 AD149-328 AD221-339	**2**	0	**nq** [suggested occur in the highest frequency at site],4mm, manufacturing present.	0	There are a few decorated pieces. Black to grey coloured sherds with burnishing are present. Mean thickness is 4.9mm but there are thicker pieces in the assemblage. Pottery is well fired and mainly quartz tempered. **[68 sherds]**	0
				Middle Phase Pottery LSA	1739±23 [KIA-16049]	charcoal	AD257-385			**N103 [**Total for Middle Phase], 5.5mm, manufacturing present.		Pottery changes as follows: 20.9% of the assemblage is decorated. The characteristic motif comprises parallel lines and 'Ripple Rim' is present. Quartz temper is fine to medium. Mean thickness of walls are 5.5mm. Mostly black and grey coloured sherds but red coloured sherds also occur. **[144 sherds]**	
10	**N2000/2** rock shelter Namibia **[2]**	-18,02924167S 12,44972222E			1850±40 [KIA-17709]	charcoal	AD130-249	**3**	0	**N10** [Total at site], 6.2mm, manufacturing absent.	0	**0** [only surface finds]	0

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4.4.2. Map 2: 290 cal BC – cal AD 310

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25	**Messum 1** rock shelter Namibia **[5]**	-21,36666667S 14,28333333E	Pre-pottery LSA Wilton	17-19cm [Horizon C]	2090±45 [KN-I.639]	charcoal	134BC-AD18	**3**	0	**nq.** Not reported in its entirety.	0		0
				7-9cm [Horizon C]	2070±90 [KN-I.637]	charcoal	195BC-AD67						
27	**Falls Rock Shelter** inland rock shelter Namibia **[66, 67, 68]**	-21,2S 14,55E	Hunter-gatherer livestock-keepers	base of Unit 5	2100±50 [Pta-2929]	charcoal	145BC-AD18	**2**	Total for Pottery Phase [Units 5 -9]: 3 decorated pieces.	**N 866**, manufacturing most intense during pottery phase at site tailing off in the upper levels.	2 fibre cordage, broken fragments [2] of a shallow bowl, carved from soft wood of the *Acacia albida*	Decorated rims show range of variation in punctate and incised motifs. 1 bowl with resin repair patches. Rim sherd with surface corrugations [possible Ripple Ware]. **[11 sherds]**	sheep [6N]
				Unit 6	1880±50 [Pta-2927]	charcoal	AD227-356						
				Unit 8 [Hollow]	2040±50 [Pta-2930]	charcoal	57BC-AD52						
28	**Snake Rock** inland rock shelter Namibia **[67, 68]**	-21,2S 14,55E	hunter-gatherers with pottery	Unit 9	1840±50 [Pta-2886]	charcoal	AD134-330	**2**	0	**N33** [total for pottery units], manufacturing present at site.	fibre and cordage [Pottery Units]	Rippled Rim Ware present [**4 diagnostic sherds and 13 body sherds**] [estimated 2 vessels present].	0
30	**N2005/2** rock shelter Namibia **[69]**	-19,05S 13,53333333E	unknown [LSA groups]	Unit II	2090±35 [KN-578]	charcoal	110BC-AD17	**3**	0	**N16**, 4.87±0.63mm, manufacturing present [minimal].	0	Undecorated dark brown to black sherds. Mean thickness 4.96±0.72mm. All have mineral quartz tempering. 1 brown sherd with parallel incised lines was recovered from this site [**Total for Units III-I: 9**].	0
33	**Leopard Cave** inland rock shelter Namibia **[8]**	-21,57277778S 15,555E	unknown [LSA groups]	Layer 6	**2270±40 [Beta270164]**	**teeth [caprine?]**	370-211BC	**2**	0	**N16**, 4.74±0.43mm, manufacturing present at site.	0	Undecorated and adiagnostic. The sherd in layer 6 is small and thin-walled [4mm] and well fired. Consistent with the first ceramics which appeared in the sub-continent in the last centuries BC. [**5 sherds**]	sheep [2N] [?] [identification potentially unreliable, Kinahan 2016]
37	**Geduld** rock shelter	-20,28333333S 15,83333333E	Hunters on the periphery of pastoralist	Level 7, sq. C6	1980±50 [Pta-4413]	charcoal	41BC-AD121	**3**	0	**N55**, 5.5±0.8mm, manufacturing present.	6 small pieces of leather, one of which is perforated.	[**16** sherds may be intrusive given that the majority come from upper levels]	0

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	Namibia **[10, 11]**		groups. [Smith et al. 1995]	level 5, sq. B6	1790±80 [Pta-4419]	dung	AD205-387			**N22**, 6.1±0.9mm, manufacturing present.	0	Ripple Rim occur below level 4. 1 spout fragment was found in level 6. All sherds are well fired and thin-walled [≤4mm]. [**137 sherds**]	sheep [5N]
				level 5, sq. B5	1790±50 [Pta-2720]	charcoal	AD239-358						
39	**Apollo 11** cave site Namibia **[4, 70]**	-27,75S 17,1E	unknown [LSA groups]		1960±45 [Pta-1918]	twigs	AD25-195	**2**	decorated pieces [context not provided]	**nq**, beads present [seems to occurr more frequently in lower levels at the site]. Manufacturing present.	0	Thin-wall grit-tempered pottery [**nq]**	0
58	**Kuidas Spring [KRS2]** small rock shelter Namibia **[12, 13]**	-20,63175S 13,84638889E	Ceramic final LSA	Brown III	**2264±27 [OxA27894]**	**charcoal**	363-211BC	**2**	0	**N141** [1 with ochre staining], 4.1±0.84mm, manufacturing present at site.	0	0	0
94	**Toteng 1** open-air camp site with number of pits Botswana **[71, 72, 73, 74]**	-20,36793333S 22,95111111E	hunter-gatherers with access to trade networks with Bantu-language speaking farmers or Hunter-gatherers with livestock and Bambata pottery.		**2020±40 [Beta18669] 2070±40 [Beta190488] 1990±60 [Beta44963]**	**cow bone sheep bone charcoal**	93BC-AD24 48BC-AD58 46BC-AD118	**1**		**N6** [Soil Unit 2]; 4.3mm, manufacturing present on site.	0	General description for both Toteng 1 and 3: Bambata Ware: 'The vessel forms include generally thin-walled, small bowls and jars…It can be seen that comb-stamping, sometimes reaching over the lip, is the most prevalent form of decoration evident on the sherds. There are also several examples that have incised lines...The temper of the Bambata sherds mainly includes grit while only 3 sherds have traces of charcoal. Bambata sherd thickness, including sherds from both sites, ranges from 4.0 to 10.1mm with a mean of 6.18mm [**Total for site: 240] [2 Bambata sherds for Soil Unit 2**]	cattle [1N], sheep [1N].

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95	**Toteng 3** open-air camp site Botswana **[71, 72, 73, 74]**	-20,36793333S 22,95111111E	hunter-gatherers with access to trade networks with Bantu-language speaking farmers or Hunter-gatherers with livestock and Bambata pottery.	20-30cm depth	1810±60 [Beta-44965]	charcoal	AD205-360	**1**	0	**N7**, 4.42mm, minimal manufacturing [6 unfinished beads at site]	0	The vessel forms include generally thin-walled, small bowls and jars…It can be seen that comb-stamping, sometimes reaching over the lip, is the most prevalent form of decoration evident on the sherds. There are also several examples that have incised lines...The temper of the Bambata sherds mainly includes grit while only 3 sherds have traces of charcoal. Bambata sherd thickness, including sherds from both sites, ranges from 4.0 to 10.1mm with a mean of 6.18mm. [**5 diagnostic Bambata sherds, 64 undecorated sherds**]	0
				Sq.? 20-30cm depth	**1710±40 [Beta194360]**	**carbon within Bambata sherd from 1991 excavation.**	AD259-422						
98	**Cae Cae 2 [Xai Xai or Nxai Nxai]** open-air pan site Botswana **[17]**	-19,93454444S 21,07823889E	hunter-gatherer	Unit II, level 13, 14	1765±55	charcoal	AD247-372	**3**	0	ostrich eggshell is present.	0	Bambata Pottery: Early thin-walled ware: charcoal and calcrete temper with incised decoration (Wilmsen 1989); Yellen and Brooks (1989) note that the pottery is largely undiagnostic and thumbnail sized.	0
99	**Mahopa 1** open-air pan site Botswana **[17]**	-19,50241667S 21,23176667E	hunter-gatherer	sq. 8 level 9, 10	1990±50	charcoal	AD85-221	**3**	0	ostrich eggshell is present.	0	Charcoal tempered sherds.	0
103	**Bambata Cave** large inland cave Zimbabwe **[19]**	-20,50277778S 28,40694444E	Hunter-gatherer with pottery [Bambata Ware]	Base of IIIb	2140±60 [Pta-3072]	charcoal	334-51BC	**3**	2 undecorated 'canteens' [Trench N]	**N 43**, 4.86±0.35mm, manufacturing present at site.	0	Bambata Ware **[3 sherds]**	sheep/goat [not positively identified]

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105	**Tshangula Cave** inland cave site Zimbabwe **[18, 19]**	-21,27279167S 28,83740278E	unknown [LSA groups]	-	2150±100 [SR-75]	charcoal	353BC-AD14	**3**	0	**nq**, some beads ochre covered.	0	Bambata Ware including plain black ware. **[Total at site: 40 sherds.]**	0
122	**Seal Midden MB2005 -005** open-air shell midden Northern Cape **[21]**	-30,46830556S 17,36005556E	coastally focused hunter-gatherers.	Occupation 2 005A top of midden	2560±60 [GX-32524]	marine shell	232BC-AD40	**3**	8 flask undecorated flask mouth fragments	**N11**, single cluster of beads, not manufactured on site.	0	0	0
147	**SK2005/074A** coastal midden Northern Cape **[22]**	-29,68847222S 17,06361111E		Layer 1	**2132±27 [OxA24526]**	**bone**	141-65BC	**3**	2 undecorated 'flask' mouth fragments	**N 2**, 4.46±0.08mm, manufacturing not present	0	0 [1 plain potsherd recovered from the surface of the site and most likely relates to a more recent occupation].	0
155	**Rooiwal Hollow (LK2001/004)** open -air coastal shell midden Western Cape **[76]**	-30,45102778S 17,34875E	hunter-gatherer groups	Area A (sq H14)	2505±20 [Pta-8915]	marine shell	147BC-AD71	**3**	3 undecorated flask mouth fragments	**N 2**, 3.78mm, no manufacturing took place at site.	0	0	0
158	**Reception Shelter (VR001)** small coastal cave site Western Cape **[22]**	-31,526S 18,60111111E	Group 1 assemblage [hunter-gatherer]	Layer 9A	**1840±26 [OxA25354]**	**bone**	AD145-249	**3**	0	**N 48** [layers 9A and 8], 4.93±0.94mm, manufacturing did not take place at site.	0	Undecorated. Wall thickness: 5,21±0.71mm **[38 sherds]**	0
				Layer 8 (middle)	**1897±25 [OxA25353]**	**bone**	AD124-205						cattle bone [?]

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165	**Spoegrivier** coastal cave site Northern Cape **[24]**	-30,28333333S 17,26666667E	Hunter-gatherers-with-livestock or pastoralist	FBS	**2105±65 [OxA-3862]**	**sheep bone**	197BC-AD19	**1**	0	**N 34**, 4.2mm, only 3 unfinished, minimal evidence for manufacturing [based on frequency of unfinished beads].	0	Pre-pottery units contain **5 undiagnostic sherds.**	sheep [2N/1M] Argued that sheep bone moved from layer 6b to layer 9 and 10.
				Layer 9 GAS2 (sq. C4) Pre-pottery	**1890±50 [GrA-9029]**	**sheep bone**	AD116-232		1 flask mouth fragments				
				Layer 9 GAS2 (sq.C6) Pre-pottery	**1900±50 [GrA-9032]**	**sheep bone**	AD85-221		1 flask mouth fragments				
				Layer 6b Twiggy 6 (sq.C6) Pottery	1930±50 [Pta-6749]	charcoal	AD63-203	**2**	0	**N 19,** 5.2mm, 0 unfinished, minimal evidence for manufacturing [based on frequency of unfinished beads].	4 pieces of twine	Very few of the sherds are decorated with the only motif of incised horizontal lines. Sherds appear to be thicker in the upper units of the pottery layers. Some sherds show a thick layer of coating of carbonised material adhering to the outer surfaces.	
167	**Ai Tomas** coastal boulder site Northern Cape **[23, 32]**	-28,58333333S 17,08333333E	Possible Pastoralist	LBS4 [Area 3]	1980±120 [Pta-5530]	charred bone	66BC-AD225	**3**	5 decorated pieces and 2 flask mouth fragments.	**N 43**, 4.5mm, manufacturing present at site.	0	undecorated and adiagnostic **[1 sherd associated with date]**	sheep [2N][9]
219	**Blydefontein** inland rock shelter site Northern Cape **[29, 30]**	-31,25S 25,1E	hunter-gatherer [interior Wilton]		**1810±50 [GrA15192]**	**fibre ceramic**	AD212-344	**1**	0	**0**	0	Grass-tempered sherds [Khoe sherds are also represented in the layer].	0
221	**Haaskraal** inland rock shelter site Northern Cape **[78, 79, 80]**	-31,55S 24,23333333E	hunter-gatherer [interior Wilton]		**1920±130 [GrA-13557]** **1970±50 [GrA-13541]** 1880±70 [SMU-1789] 1850±45 [SMU-1635]	**fibre in pottery** **fibre in pottery** charcoal charcoal	48BC-AD326 37BC-AD127 AD75-248 AD129-317	**1**	0	**N1** [Hart 1984 exc.], no manufacturing recorded at site.	0	Plain grass-tempered sherds characterize the early occupation of the interior Karoo.	0

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222	**Volstruisfontein** large inland rock shelter Northern Cape **[78, 79, 80]**	-31,48333333S 24,11666667E	hunter-gatherer		**1890±50 [GrA-13560]**	**fibre in pottery**	AD116-232	**1**	0	**0**	0	Plain grass-tempered sherds.	0
223	**Boundary** inland rock shelter site Northern Cape **[81]**	-31,53333333S 24,13333333E	hunter-gatherer	-	**2160±50 [GrA-13564]**	**fibre in pottery**	206-63BC	**1**	0	**0**	0	Grass-tempered sherds.	0
224	**Riversmead Shelter** inland rock shelter Northern Cape **[33]**	-30,63333333S 25,5E	Hunter-gatherer [Developed LSA 4]	Level V	2285±115 [GX-0723]	charcoal	410-111BC	**2**	0	**N1,** 5.2mm, manufacturing was not reported for site.	0	0	0
236	**Dikbosch [Area B]** inland rock shelter Northern Cape **[86]**	-28,65222222S 23,9025E	Pastoralist [Doornfontein]	DKB1, Area B, level II	1720±40 [Pta-3413]	charcoal	AD258-415	**3**	2 flask mouth fragments; 1 decorated piece.	**N 7,** 4.57mm, manufacturing took place at site.	2 pieces of wood and fibre	All grit tempered and lack any form of decoration. 2 sherds show a rounded lip. Mean thickness of 6.63mm. **[8 sherds]**	0
240	**Limerock 2** large inland rock shelter Northern Cape **[86, 88]**	-28,55027778S 24,13333333E	Pastoralist [Doornfontein]	Level IV [PU-A]	1720±40 [Pta-2095]	charcoal	AD258-415	**3**	7 decorated fragments	**N 28**, 4.11±0.88mm, manufacturing present at site.	0	6.50mm thick, all grit-tempered and undecorated. **[2 sherds]**	sheep/goat [2N] [? May be intrusive]
244	**Mike's Taylor Midden**	-32,335S 18,31666667E	Mega-midden, hunter-gatherer marine	FS6b, sq. E9	2160±50 [Pta-6707]	marine shell	206-63BC	**2**	0	**N3** [total at site], manufacturing not present at site.	0	0	0
				WS3, Sq. E9	2100±30 [Pta-6683]	marine shell	135-49BC						

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	coastal shell midden/mound [mega-midden]/camp site Western Cape **[36]**		exploitation camp site.	Spit 2, sq. E3	2130±50 [Pta-3641]	charcoal	198-55BC						
				Spit 7, sq. E4	2090±50 [Pta-3659]	charcoal	136BC-AD19						
				FS3, sq, E9	2070±25 [Pta-6705]	marine shell	63BC-AD19						
				FS1, Sq. E9	2000±25 [Pta-6690]	marine shell	40BC-AD71						
				Spit 3, sq. E4	1780±60 [Pta-3640]	charcoal	AD235-370						
				PSS3, sq. E9	1735±30 [Pta-6698]	marine shell	AD255-390						
257	**Tortoise Cave** small coastal rock shelter Western Cape **[40]**	-32,32694444S 18,36027778E	1300-year long hiatus.	Layer 3b	1800±50 [Pta-5616]	charcoal	AD227-356	**2**	2 flask mouth fragments	**N 7**, minimal evidence for manufacturing as only 18 unfinished beads were recovered from layer.	0	2 sherds were recovered from this level and may be considered intrusive to layer from above. **[2 sherds**]	0
			third occupation	Layer 3b	1780±50 [Pta-5615]	charcoal	AD245-360						
258a	**Steenbokfontein** coastal cave site Western Cape **[39, 40]**	-32,16166667S 18,33333333E		Layer 1 [lowermost unit]	2200±50 [Pta-6424]	charcoal	354-136BC	**2**	0	**N 1**, minimal manufacturing at site. [based on the presence of 2 unfinished beads, too small a sample]	5 pieces of twine/cordage	0	0
				Layer 1 [topmost unit]	2200±60 [Pta-6136]	charcoal	355-112BC		0				
268	**Renbaan Cave** rock shelter Western Cape **[89]**	-32,23333333S 18,86666667E	hunter-gatherer	Ash Deposits (AD)	1910±60 [Pta-3783]	charcoal	AD75-216	**3**	0	**N35**, [1 unfinished], minimal evidence for manufacturing.	One complete tortoise carapace bowl.	0 [2 sherds may derive from upper Bedding Unit where majority are found].	0
269	**Boomplaas** inland rock shelter Southern Cape **[90, 91]**	-33,38333333S 22,18333333E	Hunter-gatherer-herder	BLD2 member Hearth sq. I14	1700±55 [UW-338]	charcoal	AD254-291	**2**	5 incised decorated oes and the rim piece of an oes container from BLD2a [herder level].	**N 61**, no manufacturing took place at the site.	0	At least one bowl may be represented but the majority of the sherds appear to come from wide-mouthed pots. No lugs or bosses were found. **[45 sherds]**	sheep [1N]

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275	**Blombos Cave [BBC]** coastal cave site southern Cape **[44]**	-34,41576389S 21,22359444E	Herder	Pottery Wilton	2340±50 [Pta-6247] **1960±50 [OxA-4543]** **1880±55 [OxA-4544]**	shell **sheep bone** **sheep bone**	AD35-276 AD23-198 AD116-243	**1**	0	**N44**, 4.67mm, manufacturing present at site.	o	6mm thick, no burnishing recorded. **[2 sherds]**	sheep [2N]
281	**Witklip [WK]** small coastal rock shelter Western Cape **[92]**	-32,91694444S 17,98361111E	hunter-gatherers [Smith et al. 1991]	Unit 3 [Hearth below Light Brown Soil]	1860±50 [Pta-4609]	charcoal	AD126-247	**2**	0	**N54**, 4.7±0.8mm -	0	Ceramics conform to the Kasteelberg ceramic sequence and Rudner's Cape Coastal Ware. Mean thickness is 6.04mm. Shell impression is present. Pre-1000 BP. **[13 sherds total for Unit 3]**	0
286	**Kasteelberg A [KBA]** open air boulder site Western Cape **[92, 93]**	-32,79575278S 17,96759444E	herders [Smith 2006], hunters-with-sheep or hunter-gatherer [c. 1800 BP deposits] [Sadr 2007]		1860±60 [Pta-3711] 1790±40 [Pta-3461]	charcoal charcoal	AD120-322 AD243-342	**2**	0	**N821** [1800 BP deposits], 7mm, no manufacturing at site.	-	Mean thickness is 6mm. Jar forms. Identified as Spouted Wares.	0
294	**Die Kelders [DK1]** coastal cave site Western Cape **[97]**	-34,53555556S 19,37583333E	hunter-gatherer-fishers and possibly herder groups	layer 12	1960±85 [GX-1688]	charcoal	44BC-AD205	**3**	undecorated ostrich eggshell mouth openings.	**N2850**, 6mm, only 16 unfinished beads [minimal evidence for manufacturing].	8 fragments of marine shell ochre containers [Total for layers 12-10]. They all appear fairly large *Patella argenvillei.* Modified fragments of tortoise carapace bowl were found in layers 12 and 10.	85% of the sherds come from layer 12. 729 are quartz tempered which are fine and well finished. Thickness 5±0.1mm. 217 of the sherds are shale/siltstone tempered and appear light brown and less well fired. Thickness is 6.9±0.2mm. 1 pot appears to have a hole pre-firing and may suggest the use of cordage to hang the vessel. **[960 sherds. 2 bowls recovered from layer 12.]**	sheep [2N] appear in layer 10 and 7. Direct dating of sheep bone has produced a later date of 1325±60 [OxA-3860] and 1290±60 [OxA-3961] [Layer7]. Direct date of these remains is taken as more secure evidence for
				layer 7/9	1960±95 [GX-1689]	charcoal	46BC-AD206		0	**N70**, 1 unfinished bead. [minimal evidence for manufacturing].	0		

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													presence of livestock at site.
295	**Klein Kliphuis [KKH]** inland rock shelter Western Cape **[98]**	-32,11666667S 18,85E	hunter-gatherer	Base of Holocene deposits [Unit C]	1990±50 [Pta-4671]	charcoal	42BC-AD115	**2**	0	**N2**, 4mm, little evidence for manufacturing on site.	0	0	0
302a	**Elands Bay Cave** coastal cave site Western Cape **[47]**	-32,31001944S 18,35200278E	hunter-gatherer/pastoralist or hunters-with-sheep	COPE	2100±20	-	107-52BC	**2**	0	**nq**, beads are small and conform to 4 -4.5mm in external diameter.	string and grass bedding [*Zostera capensis*]	Pottery is present.	0
				POTA	1790±50	-	AD239-408		0	**0**			
302b	**Eland Cave 1 & 2** coastal burial site Western Cape **[42, 100]**	-32,05138889S 19,02194444E	hunter-gatherer	burial 1	**2145±50 [OxA-6217]**	**Human bone**	199-64BC	**3**	0	**N1**, grave good [?]	twine [?]	0	0
307a	**St Francis Bay 1/A [SFB1/1]** coastal open-air shell midden Eastern Cape **[49]**	-34,16002778S 24,83026944E	hunter-gatherer	layer 4	1770±50 [Pta-9311]	charcoal	AD248-362	**3**	0	**N15** (no oes beads recovered in layer 4)	0	Undescribed **[2 sherds]**	0
307b	**St Francis Bay 2/1c [SFB2]** coastal open-air shell midden Eastern Cape	-34,16002778S 24,83026944E	hunter-gatherer	layer 3	1900±50 [Pta-3910]	charcoal	42BC-AD115	**3**	0	N7	0	0	0

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	[49]												
316	**Nelson Bay Cave** large coastal cave site Western Cape **[52, 53]**	-34,10277778S 23,375E	hunter-gatherer	Unit 30	2085±35 [Pta-1363]	charcoal	106BC-AD18	**3**	0	**N4**, manufacturing not reported at site.	tortoise carapace bowls are confined to the deposits above Unit 60.	0	0 [A single sheep bone [1N] occurs between units 30 and 62. However a direct date on sheep bone from Unit 29 produced a result of 1100±80 [OxA-873]. The direct date is taken as the first secure evidence for the age of livestock at the site.]
				Unit 29	1930±60 [GrN-5715]	charcoal	AD58-205			**N9**, manufacturing not reported at site.			
316a	**Oakhurst Shelter** coastal rock shelter (human burial] Western Cape **[54]**	-33,98333333S 22,58333333E		Burial UCT194/UCT216 J	**2065±105 [AA-2116]**	**human bone**	197BC-AD110	**1**	4 ostrich eggshell containers (1 behind skull, 1 near chest, 1 near grindstone).	**0**	two tortoise carapaces (1 small mountain tortoise carapace containing 'blue pigment', 1 empty mountain carapace).	0	0
317	**Uniondale Rock Shelter** large inland rock shelter Eastern Cape	-33,26027778S 26,66611111E	unspecified LSA groups	Unit C/D, sq. 14E	2130±60 [Pta-1803]	charcoal	204-49BC	**3**	6 flask openings	**N1** [associated prior to pottery in Unit C/D], no evidence of manufacturing at site.	worked tortoise shell carapace	8 different vessels are represented. Small bowls and globular neck pots seem to be most common. Four different tempers could be identified. These include: 1. Undecorated, black, grass-tempered straight-sided bowl [similar to Highlands and Wilton pottery assemblages]. 2. A black grass tempered wide-mouthed beaker with impressed decoration [similar	0
				Unit B	undated		between 204 and 52BC		0				

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	[101]			Unit A, sq. 13D	2125±55 [Pta-1804]	charcoal	199-52BC					to Sampson's Smithfield Ware from the Seacow River Valley, central interior of South Africa. 3. A thin-walled burnished red ochre ware, decorated with showed grooved or impressed bands. Some sherds suggest globular pots with necks with no indication of lugs. [Referred to as Albany Ware as being distinct from Khoe Cape Coastal Ware] [similar to Welgeluk site pottery assemblage]. 4. A plain quartz-tempered ware, bag-shaped pots [similar to Welgeluk site]. Chronological markers indicate that the thin-walled, well backed, burnished ware predates the thicker-grass tempered beakers and bowls. Pottery is suggested to be secure in Unit A.	
327	**Wilton Large Rock Shelter** inland rock shelter Eastern Cape **[102]**	-33,325S 26,14166667E	Hunter-gatherer	Layer 2b [base]	2270±100 [GaK-1540]	charcoal	398-155BC	**3**	0	**N8,** [recovered from above date]	0	Quartz tempered pottery. Minimum thickness of 6mm.	0
329	**Edgehill** inland rock shelter Eastern Cape **[103]**	-32,89083333S 26,41333333E			1830±60 [Pta-3564]	charcoal	AD136-339	**3**	0	**0**	0	Pottery is similar to Uniondale Albany ware.	0
351	**Mhlwazini Cave** inland rock shelter KwaZulu-Natal **[59]**	-29,04777778S 29,38972222E	LSA	Layer 5 (AOBS)	2280±50 [Pta-4868]	charcoal	383-211BC	**2**	0	**N7,** manufacturing absent.	0	Pottery possibly intrusive from overlying levels at site. **[4 sherds]**	0
352	**Collingham Shelter** inland rock shelter KwaZulu- Natal **[106]**	-29,45972222S 29,79583333E	hunter-gatherer	BSV3 (&FGBS), GAD, VP2, BSV1	1830±50 [Pta-5098] 1880±45 [Pta-5101] 1770±50 [Pta-5274] 1810±60 [Pta-5265]	charcoal samples	AD140-337 AD125-228 AD248-362 AD205-360	**2**	0	**N16**, 4.72±0.94m, no manufacturing not present at site.	gourd [2 have smooth edges and may suggest they could be rim pieces], knotted grass, knotted leather thong, string. [Twine was found related to a fish	Mean thickness excluding TBS is 5.88±2.27mm, bag-shaped and black-to-grey in colour. Referred to as Pre-agriculturalist Ware. **[16 sherds]**	0

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											hook recovered in BSV3]. Possible modified tortoise carapace bowl.		
355	**Mzinyashana 1** inland rock shelter KwaZulu-Natal **[60]**	-28,31416667S 30,47222222E	Hunter-gatherer	Layer 6	2260±50 [Pta-6542]	charcoal	366-208BC	**2**	0	**N1**, ochre stained, no manufacturing at site.	0	0 [pottery considered intrusive to layer] **[2 sherds]**	0
358	**Driel Shelter** inland rock shelter KwaZulu- Natal **[108]**	-28,76416667S 29,29027778E	hunter-gatherer	layer 3 (referred to as Older Ash level (OA)	1775±40 [Pta-1381]	charcoal	AD249-356	**2**	0	**N15**, 4mm, manufacturing not present on site [only 2 unworked fragments]	[non-organic schist bowl]	Pre-agriculturist pottery. **[14 sherds]**	0
360	**Borchers Shelter** coastal rock shelter KwaZulu-Natal **[109]**	-30,70277778S 30,28222222E		Layer 3 [Dark Brown]	2070±50 [Pta-3108]	charcoal	101BC-AD27	**2**		**N22**, [includes some bone beads], manufacturing absent.			
362a	**Shongweni South Cave** coastal large cave KwaZulu-Natal **[110, 111]**	-29,86277778S 30,72083333E	hunter-gatherer mixed with early farmer occupation.		1770±60 [Pta-821]	charcoal	AD242-377	**3**	0	**0**	twine and knotted grass. Bottle gourd [*Lagenaria siceraria* (Mol)] was recovered below this date.	Several sherds from J5 A-C (apparently covering without stratification Levels 2-5) seem associated. They belonged to a rather finer large pot 5-8 mm thick, black on both faces. There may be pieces of a similar or the same pot from J2-B and B-B (Level 3). A rim from G3-B (fig. 6.8) and a sherd from G3-A (Levels 1-2) seem to have come from a small black vessel. [Davies 1975, pp 641]**. [76 sherds total at site].**	0
365	**Jubilee Shelter** inland rock shelter site	-25,69166667S 27,91333333E	Hunter-gatherer with pottery	Level B ,sq. C4	1840±50 [Wits-1398]	charcoal	AD134-330	**3**	Total for Bambata Levels: 1 undecorated	**N 49 [total for Bambata Levels 196]**, manufacturing present at site.	0	The decorated sherds contain stamped impressions on neck and rim with occasional incised cross-hatched decoration. Undecorated sherds are thin-walled between 3.2 and 9mm as opposed to post-	sheep [1N] was recovered from Level

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	Gauteng **[95, 112, 113, 114]**		[Bambata Ware]						water bottle fragment. 1 incised shell			Bambata levels. **[Total for Bambata levels: 121 sherds of which 100 undecorated]**	B but has been directly dated to 310±50 BP [OxA-6039]
374	**Balerno Shelter 3 [Warthog Shelter]** small inland rock shelter Limpopo **[61]**	-22,28694444S 29,20361111E	hunter-gatherer	Unit AG2 sq. G8	1920±45 [Pta-7997]	charcoal	AD75-203	**2**	0	**N3**, manufacturing is minimal with beads rare.	0	0	0
376	**Olieboomspoort [OBP]** large inland rock shelter Limpopo **[63]**	-23,87833333S 27,63805556E	Hunter-gatherer	Layer 9, sq. D5	2010±50 [Pta-8410]	charcoal	49BC-AD72	**3**	decorated fragments of ostrich eggshell present [some of which are ochre stained].	**N461** [layer 9], ochre staining occurs on majority of beads. Manufacturing present on site.	gourd [possible tsamma], modified tortoise carapace bowls [present at site], *Strychbos* fragments may have been derived from containers [use for holding pigments, ochre stained].	**1 Bambata Sherd**, mostly jar form contains ochre staining or encrustation. **1 Eiland type** sherd [Farmer Ware]	0
				Layer 5, sq. D5	2000±25 [Pta-8030]	charcoal	40BC-AD71						
				Layer 3, sq. D5	1700±45 [Pta-7798]	charcoal	AD257-434						
377	**Leholamogoa [LMG]** inland rock shelter Limpopo **[115]**	-23,26777778S 28,82555556E	hunter-gatherer	Spit 5	**2160±60 [Beta-236645]**	**charcoal**	343-61BC	**2**	0	**N 8**, 4.43±0.83mm, some manufacturing present at site.	0	0	0
					2130±40 [Beta-236644]	**charcoal**	195-58BC						
394	**Moshebi's Shelter** inland rock shelter Lesotho **[65]**	-29,93333333S 29,03333333E	LSA	Spit 4	2180±45 [Pta-319]	charcoal	348 -100 BC	**2**	0	**N2**, manufacturing absent	0	One piece of pottery possibly intrusive to layer **[1 sherd]**	0

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396	**Likoaeng** inland open-air site Lesotho **116, 117, 118, 119]**	-29,73555556S 28,76305556E	Hunter-gatherer-fishers. [Phase C]	layer V	2000±70 [Pta-9048]	wood charcoal	49BC-AD115	**2**	0	**N55** [level III], Manufacturing not present on site. Layer III's beads came from a core zone (M/L/K-4/5)		0	sheep/goat [2N] [Sheep bone is considered unreliable with a 9% accuracy rate]
				layer V	1850±4 [Pta-7092]	wood charcoal	AD130-249						
				layer III	1850±15 [Pta-7097]	wood charcoal	AD205-242						
				layer III	1830±15 [Pta-7865]	wood charcoal	AD215-249						
397	**Sehonghong** large inland rock shelter Lesotho **[120, 121]**	-29,76666667S 28,78333333E	hunter-gatherer-fishers [Ceramic Wilton]	layer GAP base	1710±50 [Pta-6063]	charcoal	AD254-425	**2**	0	**N 25**, 4.84±1.02mm, 1 ostrich eggshell fragment and 6 incomplete beads. Manufacturing not present on site.	0	This provides the earliest date for the pottery layer. Mean thickness 8±1.5mm, grey-to-black in colour. Some possible pre-agriculturalist ware present. **[52 sherds]**	0
406	**SAM-AP 1449** inland small rock shelter burial Western Cape **[42]**	-32,17861111S 18,89083333E	Hunter-gatherer	burial	**2330±100 [OxA-453]**	**human bone [direct]**	507-202BC	**1**	0	0	twine and animal skin	0	0
9	**N2000/1** large rock shelter Namibia **[2]**	-18,96878056S 12,43741111E		Top of Sediment C	1955±28 [KIA-11986]	charcoal	AD58-121	**F**	0	0	0	**0**	0
14	**Fackelträger** rock shelter	-21,56666667S 15,53333333E		5-15cm	2190±40 [KN-I.732]	charcoal	350-113BC	**F**	Stratigraphic context not provided: 1	**nq**. Not reported in its entirety.	0	early grit-tempered pottery present. Further description is not provided. **[1 sherd]**	0

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4.4.2. Map 2: 290 cal BC – cal AD 310

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Site Reference Number	*Site Name Type of site Region Source*	*Co-ordinates*	*Cultural Affiliation*	*Stratigraphic Context*	*Uncal. Radiocarbon Date [BP] and Lab ID*	*Material Dated*	*Cal. Radiocarbon date*	*Date Grade*	*Ostrich eggshell flask and or decorated pieces description.*	*Ostrich eggshell bead data [quantity (N), mean diameter, and manufacturing]*	*Other organic material recovered at site*	*Pottery at site and quantity of sherds present.*	*Livestock at site and quantity (M=MNI, N=NISP).*
	Namibia **[4, 6]**			10-25cm	2150±60 [KN-I.731]	charcoal	337-56BC		complete ostrich egg worked into a container and 1 engraved fragment.				
15	**Etemba 2** shallow shelter Namibia **[4. 6]**	-21,45S 15,65E		43-45cm	1890±50 [KN-465]	charcoal	AD116-232	**F**	Stratigraphic context not provided: 2 fragments of ostrich eggshell containers	nq. Not reported in its entirety.	0	0 [pottery was found above this date therefore association is not secure.]	0
96	**Depression Rock Shelter** inland rock shelter Botswana **[75]**	-18,73659722S 21,74091389E	hunter-gatherer	50-60 cm depth	**1860±90 [Beta-22878]**	**charcoal**	AD79-339	**F**	0	ostrich eggshell is present.	0	A few undecorated sherds.	0 [Poor preservation of bone]
159	**Buzz Shelter (VR005)** small coastal cave site Western Cape **[22, 77]**	-31,52363889S 18,60027778E		Layer 3 top (OII SW L4a)	**1921±25 [OxA-24515]**	**bone**	AD78-202	**F**	Painted ostrich eggshell fragments and undecorated mouth piece fragments.	**N35**,4.10±0.64mm, minimal evidence for manufacturing at site.	string [associated with beads], netting present.	1 plain body sherd [1 sherd] [top of layer 3 and not associated with radiocarbon date].	sheep/goat [1N]
189	**Jagt Pan 7** inland oval shaped stone feature site Northern Cape **[27, 28]**	-30,65928333S 22,08681667E		Spit 2	2360±60 [Pta-4309]	oes	486-235BC	**F**	Spit context not provided: 4 fragments of ostrich eggshell flask mouths.	**nq**, Not reported in its entirety. 1037 ostrich eggshell fragments were recovered from the site.	0	Ceramics are thin-walled on average 4mm thick and black burnished. **[4 sherds Spits 2-3]**	0
230	**Powerhouse Cave** inland cave site	-27,61666667S 24,61666667E	Hunter-gatherer	Level I [10-15cm depth] sq. A	2250±70 [Pta-1763]	charcoal	374-201BC	**F**	0	**nq**	0	0	0

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4.4.2. Map 2: 290 cal BC – cal AD 310

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	Northern Cape **[82]**												
232	**Bloubos 5 [BB5]** inland circular stone structures assoc. LSA Northern Cape **[83, 84]**	-28,13333333S 20,8E		surface	1810±45 [Pta-7381]	oes	AD218-340	**F**	0	**0**, ostrich eggshell fragments present.	0	Fragments of thickened bases, lugs and decorated rim sherds [out of context]. 12 pot sherds from the site have a light reddish brown colour, fine texture, and grit temper. The average thickness is 5.6mm. General appearance place them in the range of Khoe pottery. **[Small sample]**	0
234	**Wonderwerk** large inland cave Northern Cape **[85, 86, 87]**	-27,84583333S 23,55527778E	Pastoralist [Doornfontein]	Layer 3 [top] Beaumont Exc. 1979	1890±50 [Pta-2542]	charcoal	AD116-232	**F**	decorated fragments [quantity not provided]	**N 57**, incomplete beads present, manufacturing present at site.	0	between 7.69 and 4.8mm. All grit tempered and undecorated. Typical of 'Hottentot' pottery	Layer 3a sheep hair [direct AMS 460±120 [OxA-622] AD1410-1626 15-16
247	**Grootrif G [GFG]** coastal shell midden/mound Western Cape **[37]**	-32,16666667S 18,31222222E	Hunter-marine-gatherer [mega-midden phase]	Layer 3 [mega-midden Lens]	2380±60 [Pta-4055]	charcoal	537-264BC	**F**	0	0	0	0	0
293	**Byneskranskop** coastal cave site Western Cape **[94, 95, 96]**	-34,58333333S 19,46666667E	Hunter-gatherer or possible Pastoralist	Layer 1	**1891±28 [OxA-32676]**	**tortoise carapace**	AD128-206	**F**	Total for layer 1: 0 flask mouth fragments. 9 decorated pieces.	**N 824**, 4-8mm, manufacturing present at site.	kelp [*Eckonia maxima*]	Sherds range in thickness from 2-10mm with a mean of 5.4±1.3mm. All show quartz grit. 15 sherds contain carbonised organic material mixed into the clay [possible accidental inclusion?]. **[Total for layer 1: 426 sherds]**	First direct date for sheep remains are 1370±60 [OxA-3863] - AD652-765. [Group 13]
299	**Faraoskop Rock Shelter** rock shelter	-32,12527778S 18,61444444E		layer 2 [Unit Mac]	2000±70 [Pta-4955]	charcoal	49BC-AD115	**F**	Layer 2: 1 decorated piece recovered [Bar	**N 18**, manufacturing took place at the site.	twine	Possibility that the 1 sherd recorded is not in-situ.	0

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4.4.2. Map 2: 290 cal BC – cal AD 310

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	Western Cape **[99]**								with cross-hatching.]				
341	**Twyfelpoort Shelter** inland rock shelter Free State **[104]**	-28,61666667S 27,56666667E		pre-ceramic level	1880±50 [Pta-6171]	charcoal	AD121-236	**F**	0	**nq**	0	0	0
344	**Clarke's Shelter** inland small open rock shelter KwaZulu-Natal **[105]**	-29,02083333S 29,31611111E	Hunter-gatherer	layer 3 (Pale Brown Sand 2)	2160±50 [Pta-2971]	charcoal	206-63BC	**F**	0	**0**	0	All plain undecorated body sherds, thin-walled, black-to-grey in colour. Possible pre-agriculturalist ware**. [9 sherds]** [considered less reliable].	0
356	**iNkolimahashi Shelter** inland rock shelter KwaZulu-Natal **[107]**	-28,79416667S 30,18055556E	Hunter-gatherer	Layer 6	1990±60 [Pta-7384]	charcoal	46BC-AD118	**F**	0	0			
398	**Siphiso Shelter** small inland rock shelter Eswatini **[122]**	-26,31388889S 31,975E	Hunter-gatherer	Stratum III	1940±370 [TX-5619]	bone	359BC-AD517	**F**		**N52** [Strata I-V], 5.59±0.856mm, manufacturing not reported for site.	0	7mm thick, dark-to-grey in colour. Grit-tempered. Some sherds show burnishing. A sherd resembles similar Swazi pottery. Possible pre-agriculturalist ware. **[7 sherds]**	0
400	**Langubhela Shelter/Sibebe Shelter** inland rock shelter Eswatini	-26,28333333S 31,16666667E	Hunter-gatherer	sq. J10 70-75cm depth	1950±50 [Pta-3347]	charcoal	AD29-200	**2**					

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	[122]												

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4.4.3. Map 3: cal AD 311- 911

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2	**Oruwanje 95/1** inland rock shelter site Namibia **[2, 3]**	-18,30513056S 13,44698889E	unspecified LSA group [Middle Ceramic Phase unknown]	7/10a/-95	1520±32 [KN-5297]	charcoal	AD573-635	**2**	0	**nq.** 6.0±1.6mm [unusually large], manufacturing present on site.	-	Typical feature of sherds is that they appear brown or ochre in colour. Mean sherd thickness is 5.7mm with quartz grit temper. 2 sherds decorated with incised grooves. 1 'Ripple Rim' present. **[15 sherds]**	0
				4/11b/-90	1511±33 [UtC-5938]	charcoal	AD580-637						
				4/12a/-105	1419±40 [UtC-5947]	charcoal	AD634-681						
			unspecified LSA group [Late Ceramic Phase unknown]	7/12c/-65	1280±28 [KN-5004]	charcoal	AD766-875		0	**N43**, 5.4±1.1mm [return to a smaller diameter], manufacturing present on site.	0	Mean sherd thickness is 6.3mm with fine to medium grained quartz grit but coarse temper was used in the manufacture of thick-walled vessels. 1 handle or spout fragment. Colour is mostly black. Main type of decoration is 'channelled ware' which can be grooved horizontal or diagonal lines. 3 sherds show a complex herringbone pattern and another 2 sherds have comb-stamped decoration. 'Ripple Rims' are present in this phase but form part of one or two of the older ceramic assemblages at the	goat (?) not positive [nq]. Left out of mapping exercise.
				4/12a/-85	1255±40 [UtC-5948]	charcoal	AD773-879						
				7/12d/-60	1252±36 [UtC-5945]	bulb scale	AD773-880						
				7/12d/-60	1194±32 [UtC-5945]	soot	AD879-970						
				7/12c/-60	1178±32 [UtC-5586]	seed	AD888-970						
				7/11a/-65	1172±32 [Utc-5939]	charcoal	AD892-970						
				7/11c/-75	1120±55 [KN-5299]	charcoal	AD895-1021						

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												site. Mostly likely Phase 3. **[63 sherds]**	
3	**Hartmann Valley 95/4** coastal plain boulder site with stone structures Namibia **[2]**	-17,50207778S 12,47924167E	unspecified LSA group [Phase 2: Ceramic LSA]	54/50d/-60	1480±30 [KN-5287]	charcoal	AD600-645	**2**	0	**N1**, 7.37mm [based on 3 unfinished beads], manufacturing not reported for site.	0	Sherds are thin [5.75±1.58mm] and hard fired. Black-to-grey and brown sherds. 1 sherd decorated with oblique parallel lines banded around rim.	0
				53/49c/-60	1407±50 [KN-4851]	charcoal	AD632-764						
5	**Ovizorombuku 96/1** large rock shelter Namibia **[2]**	-17,04309444S 13,21597222E	unspecified LSA group [Phase 2: Ceramic LSA]	20/21b/-90	1525±35 [KN-5259]	charcoal	AD549-633	**2**	0	**N6** [total for phase 2]; 5.0±0.6mm, no manufacturing present on site.	0	Assemblage is homogenous. Colour of sherds are grey to black or ochre. Temper is of quartz grit in high quantity. Most common decorative motif are incised horizontal or oblique lines. 1 herringbone like motif. Another distinct motif is the finger-nail impressions on a very thin-walled sherd. Mean wall thickness is 5.5±1.1mm. The profiles of the rim fragments are in two cases tapered with a narrow, rounded lip, the third rim becomes slightly wider and the lip is horizontally truncated. **[39 sherds]**	0
				20/20c/-110	1442±25 [KIA-11985]	charcoal	AD634-664						
				20/20a/-100	1275±30 [KN-5373]	charcoal	AD768-874						
8	**Omungunda 99/1** large rock shelter	-18,02492222S 13,78665278E	unspecified LSA group [Phase 3:	5/4d/-115	1705±35 [KN-5641]	charcoal	AD343-422	**2**	0	**N102**, 5.5mm, manufacturing present on site.	0	20.9% of the assemblage is decorated. The	0

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	Namibia **[2]**		Middle Ceramic LSA]	4/4c/-105	1602±29 [KIA-22463]	charcoal	AD439-540					characteristic motif comprises parallel lines and 'Ripple Rim' is present. Quartz-temper is fine to medium. Mean thickness of walls are 5.5mm. Mostly black and grey coloured sherds but red coloured sherds also occur. **[144 sherds]**	
				12/6d/-100	1600±35 [KN-5285]	charcoal	AD439-542						
				4/4d/-110	1565±35 [KN-5640]	charcoal	AD482-596						
				4/4a/-105	1530±30 [KN-5642]	charcoal	AD548-629						
			unspecified LSA group [Phase 2: Late Ceramic LSA]	3/4b/-95	1298±23 [KIA-16047]	charcoal	AD684-838		0	**N59**, 4.9mm, manufacturing present on site.	0	Average wall thickness is 5.8mm. 31% of the sherds are black to grey and well fired. Quartz temper is fine to medium grain size. 13.3% of the pottery is decorated. 2 sherds display indented decoration and another a herringbone pattern. **[163 sherds]**	0
				11/6b/-100	1145±35 [KN-5288]	charcoal	AD895-990						
11	**N2002/7** stone circle site Namibia **[2]**	-18,29626667S 12,0262E	unspecified LSA groups	-	1235±35 [KIA-21034]	charcoal	AD774-888	**2**	0	**N109**, 11.36±1.7mm, manufacturing present.	0	1 nearly complete pot displays an S-shaped profile with an outward projecting rim and a diameter of 171 mm. The decoration, a herringbone pattern bordered by a single line of stab marks, resembles sherds from late Ceramic LSA inventories from rock shelters in Kaokoland. **[15 sherds with 1 nearly complete pot]**	0
					1175±25 [KIA-18893]	soot from sherd	AD890-969						
					1150±30 [KIA-21035]	charcoal	AD895-988						

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25	**Messum 1** rock shelter Namibia **[5]**	-21,36666667S 14,28333333E	unspecified LSA group [Pottery Phase at site]	Sq. A9	1370±50 [Pta-2681]	plant fibre	AD652-765	**3**	0	**nq**. Not reported in its entirety.	0	Pottery not described	0
28	**Snake Rock** inland rock shelter Namibia **[67, 68]**	-21,2S 14,55E	Hunter-gatherers	Unit 10	1640±70 [Wits-1249]	charcoal	AD385-543	**2**	0	**N33**, manufacturing present at site.	bone vessel, fibre cordage	Ripple Rim present **[17 sherds]**	sheep [2N]
31	**Big Elephant Shelter** inland rock shelter Namibia **[7]**	-21,68333333S 15,66666667E	Hunter-gatherer [with pottery]	3-6 inches	1400±80 [UCLA-724B]	charcoal	AD605-768	**2**	0	**N151** [Total for Pottery Units], 3mm and 10mm, only 18 incomplete beads, manufacturing present on site but the greatest bead making activities occurred during the pre-pottery phase at the site.	thin and thick twine/rope, leather thongs.	A broken decorated spout fragment was recovered from the site. Undecorated sherds are grey in colour and are 6-7mm thick. **[22 sherds]**	0
32	**Mirabib Hill Shelter** rock shelter Namibia **[123]**	-23,45S 15,31666667E	unspecified LSA groups	10-20cm [Dung Floors] Date from below first dung floor.	1550±50 [Pta-1535]	dung	AD520-634	**3**	.	**N185**, manufacturing present.	9 fragments of leather, knotted grass and twine.	All undecorated, dark and fairly fine. A complete pointed base pot found cached near site. No lugs are present but drilled holes may suggest the use of leather or fibre handles. **[5 sherds]**	sheep hair
34	**Skorpion Cave** cave site Namibia **[124]**	-27,8895S 16,64566667E	Hunter-gatherer	Unit 2	**1340±60 [Beta-160049]**	**charcoal**	AD657-830	**3**	.	**N2**, 5.3±0.1mm, minimal evidence for manufacturing.	0	The vessel rim is tapered and slightly bevelled, appears to be fine with no quartz inclusions. Encrustation on the outer surface of the vessel suggests that it was used for cooking. [1 rim and **16 body sherds]**	0
35	**Spitzkoppe** rock shelter	-21,82341111S 15,17828333E	Pastoralist	Unit 10: Compact Ash [0.1m]	1240±50 [Pta-4635]	charcoal	AD769-948	**2**	0	**nq**, manufacturing present.	0	Coarse and undecorated. 1 thin curved rim might	0

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	Namibia **[67]**											possibly be part of a shallow bowl.	
39	**Apollo 11** cave site Namibia **[4, 6]**	-27,75S 17,1E	unspecified LSA groups [Pottery Wilton]	12-17cm	1670±55 [KN-I.870]	uncharred twigs	AD369-519	**3**	decorated pieces [context not provided].	**nq,** manufacturing present.	0	Pottery is undescribed	0
				6-10cm	1460±55 [KN-I.846]	uncharred twigs	AD590-666						
40	**Arrisdrift** open-air camp site with shells Namibia **[14]**	-28,46666667S 16,68333333E	unspecified	Hearth 5cm depth	1200±50 [Pta-1933]	charcoal	AD785-974	**3**	0	0	0	grit-tempered pot [no further description]	0
				Pot	1250±130 [Pta-1945]	soot from pot	AD682-969						
89	**Thamaga 1** inland rock shelter Botswana **[72, 125]**	-24,69748611S 25,49193333E	Hunter-gatherer with Farmer contacts	20 - 30 cm depth	1190±90 [I-13,181]	charcoal	AD774-989	**2**	1 undecorated ostrich eggshell mouth fragment.	**N14,** 4 - 5.7mm, manufacturing present at site.	0	Pottery associated with early farmer ware.	sheep/goat was positively identified above this date at 10-20cm.
92	**White Paintings Rock Shelter [WPS]** inland rock shelter Botswana **[126]**	-18,77189722S 21,74985E	Hunter-gatherer context with Early Farmer component	Upper Unit 2a, sq.22, 40-50cm depth	**1225±60 [OxA-6038]**	**sheep jaw [direct AMS]**	AD772-961	**1**	0	**nq**, small, manufacturing present.	0	Most of the pottery consists of undecorated body sherds, comb stamping and incised sherds are present. These decorated sherds are similar to Divuyu [AD 550-730] and to the later site of Nqoma [AD850-1090]. These dates provide a reasonable estimate for the deposit. **[376 sherds]**	sheep [1N]
				Sq. 9, 40-50cm	**1080±100 [Beta-33056]**	**charcoal**	AD893-1145						
94	**Toteng 1** open-air camp site with number of pits	-20,36793333S 22,95111111E	Hunter-gatherers with access to trade networks with	sq. G, 45-50cm depth	**1639±33 [AA-58186]**	**charcoal temper from undecorated body sherd.**	AD419-518	**1**	0	**N15** [SU3], 4.3mm, manufacturing present on site.	In 1991, Campbell reported that in an excavation of a midden at Toteng	General description for both Toteng 1 and 3: Bambata Ware: 'The vessel	cow [1N], sheep/goat c.f. [4N]

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	Botswana **[71, 72, 73, 74]**		Bantu-language speaking farmers or Hunter-gatherers-livestock-keepers with Bambata pottery.	sq. I, 55-60cm depth	**1560±60 [Beta-184609]**	**charcoal**	AD474-628				1, there were two oes with decoration. A larger piece was recovered from 140-160 level in Test Pit 1. The small piece was recovered from TP1 but at 80-100cm. Below this at 1.6. was a cache of large oes pieces [possibly part of buried water-containers or raw oesb products]? The association with radiocarbon ages from the site is unclear since it took place in a different area.	forms include generally thin-walled, small bowls and jars…It can be seen that comb-stamping, sometimes reaching over the lip, is the most prevalent form of decoration evident on the sherds. There are also several examples that have incised lines...The temper of the Bambata sherds mainly includes grit while only 3 sherds have traces of charcoal. Bambata sherd thickness, including sherds from both sites, ranges from 4.0 to 10.1mm with a mean of 6.18mm **[Total for site: 240]**	
				sq. L, 55-60cm	**1480±40 [Beta-186670]**	**cow bone**	AD594-648						
95	**Toteng 3** open-air camp site Botswana **[71, 72, 73, 74]**	-20,36793333S 22,95111111E	Hunter-gatherers with access to trade networks with Bantu-language speaking farmers or Hunter-gatherers-livestock-keepers with Bambata pottery.	sq. 3 30-35cm depth	**1610±40 [Beta-182060]**	**organic residue in undecorated body sherd.**	AD433-535	**1**	0	**N7** [Unit 3], 4.42mm, manufacturing present at site.	0	General description for both Toteng 1 and 3: Bambata Ware: 'The vessel forms include generally thin-walled, small bowls and jars…It can be seen that comb-stamping, sometimes reaching over the lip, is the most prevalent form of decoration evident on the sherds. There are also several examples that have incised lines...The temper of the	sheep/goat [1N]
				20-25cm	**1600±50 [Beta-44966]**	**charcoal**	AD431-568						
				sq. 7 30-35cm depth	**1130±40 [Beta-186671]**	**poorly preserved sheep/goat molar**	AD897-1014						

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												Bambata sherds mainly includes grit while only 3 sherds have traces of charcoal. Bambata sherd thickness, including sherds from both sites, ranges from 4.0 to 10.1mm with a mean of 6.18mm. **[5 Bambata sherds, 64 undecorated sherds]**	
98	**Cae Cae 2 [Xai Xai or Nxai Nxai]** open-air pan site Botswana **[17]**	-19,93454444S 21,07823889E	hunter-gatherer	Unit II, level 13, 14	1765±55	charcoal	AD247-372	**3**	0	ostrich eggshell is present.	0	Bambata Pottery: Early thin-walled ware: charcoal and calcrete temper with incised decoration (Wilmsen 1989); Yellen and Brooks (1989) note that the pottery is largely undiagnostic and thumbnail sized.	0
100	**Lotshitshi** inland open-air site Botswana **[127, 128, 129]**	-20,02192222S 23,51215278E	LSA with pottery and cattle	middle LSA level	1660±100	bone	AD340-572	**3**	0	not published in its entirety.	0	Mostly fragmented but charcoal tempering can be discerned. Finely incised decoration. Comparable with Bambata Ware pottery.	cattle [1N]
126	**KN2004/012** semi-deflated small shell midden, coastal Northern Cape **[22]**	-30,23597222S 17,25016667E	unspecified LSA group [Group 2]	H16 midden	**1579±24 [OxA-22977]**	**charcoal**	AD483-580	**3**	0	**N3**, 4.95±1.73mm, no manufacturing present at site.	0	2 decorated potsherds: the rim has short diagonal lines, probably impressed around the lip with horizontal lines. Body sherd has 2 rows of vertical impressions. Thickness: 4.79 ± 0.82mm. **[2 sherds]**	0

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129	**KN2005/041** in situ coastal shell midden**.** Northern Cape **[130]**	-30,23511111S 17,25E	unspecified LSA group	H6 Midden	**1631±23 [OxA-22979]**	**charcoal**	AD426-518	**1**	0	**N3**, 4.74±0.15mm, manufacturing present on site.	0	0	cow [horn core DNA tested and directly dated]
				E6 Midden	**1625±25 [OxA-22933]**	**bos taurus**	AD431-519						
131	**KN2005/054** small dense coastal shell-midden Northern Cape **[22]**	-30,23691667S 17,24975E	unspecified LSA group [Group 3]	D13 MS1	**1598±25 [OxA-22932]**	**bone**	AD442-543	**3**	0	**N4**, 5.34±0.27mm, no manufacturing present at site.	0	Comb-incised necked vessel. 7.08±0.45mm thickness **[2 sherds]**	0
157	**KK002** inland shallow coastal rock shelter [in-situ deposits Northern Cape] **[22]**	-31,24247222S 18,05161111E	unspecified LSA groups	|I2 SE L5B (lower)	**1462±24 [OxA-25349]**	**bone**	AD605-651	**3**	0	**N7**, 5.32±1.11mm		1 sherd undecorated. Wall thickness: 5.96mm. [1 sherd] [most likely intrusive from upper deposits.]	0
165	**Spoegrivier** coastal cave site Northern Cape **[23, 24]**	-30,28333333S 17,26666667E	Hunter-gatherers-with-livestock or pastoralist	Pottery Units: below Twiggy 3 [layer 2] and above YBS Layer 7	Below 1390±50 [Pta-4753] and above **1490±50 [GrA-9030]**	charcoal and **sheep bone**	around AD643-765	**2**	2 undecorated flask mouth fragments were recovered from pottery unit, Layer 4.	**N57** [levels 6a-2], 5.2mm, manufacturing present on site.	Most of the organic fibre string/twine was recovered from the pottery units at the site. Knotted grass remains are also present. A tortoise shell bowl was recovered from upper levels in Twiggy.	Mostly undecorated. Mean wall thickness: 4.8mm to 6.1mm in the upper levels. Layers 3 and 4 have a coating of carbonised material adhering to outer surfaces. **[330 sherds layers 6a-2]**	sheep [80N]
169	**Jakkalsberg A JKBA** inland open-air site Northern Cape **[131, 132, 133]**	-28,18055556S 16,8875E	Pastoralist	Hearth 1	1330±60 [Pta-5958]	charcoal	AD663-838	**2**	5 decorated fragments and 1 flask mouth.	**N300**, 5.4mm, no manufacturing on site.	-	Only 41 out of the total of 922 potsherds are decorated. The most common decoration is incised horizontal lines. [922 sherds]	sheep [8N], sheep/goat [114N]
				Hearth 2	1300±25 [Pta-6100]	charcoal	AD684-836						
170	**Jakkalsberg B JKBB**	-28,18055556S 16,8875E	Pastoralist	Hearth /KII	1420±25 [Pta-6122]	charcoal	AD646-671	**2**	-	**N35**, 5.2mm, manufacturing present on site.	Two ochre plugs recovered have fibre string	Similar decoration to Site A. Lug was identified in upper	sheep [5N], sheep/goat [76N]

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	inland open-air site Northern Cape **[131, 132, 133]**			Hearth 2 (MOU)	1380±50 [Pta-6101]	charcoal	AD648-765				markings suggesting that they were used to plug an object of fibrous origin. [Webley 1997, pp. 9]	levels but remains undated. **[505 sherds]**	
196	**Doornfontein 1** inland cave site [prehistoric specularite mine] Northern Cape **[134]**	-28,20555556S 23,03333333E	Pastoralist [Doornfontein]	Stratum 1, Exc. 1	1120±40 [Pta-187]	charcoal	AD900-1018	**3**	Decorated fragments [nq] with intricate hatched geometric patterns in bands and triangles.	**N331** [total at site], range between 4.5 and 7.5mm, reporting of manufacturing not present.	0	Pottery assemblage contains some undecorated plain rims, some body sherds with red slip.	0
187	**Biesje Poort 2** open air site Northern Cape **[27, 28]**	-28,65891667S 20,50875E	Pastoralist [Doornfontein]	Exc 1, Spit 10	1580±40 [Pta-9569]	charcoal	AD472-582	**3**	diagonally incised fragments from spit 9.	**N 19** [no beads associated with date but do occur in level 9 [total at site 19]	0	Sample consists mostly of body sherds. 2 spout fragments from spits 6 and 7. Only 3 pieces decorated and included incised lines below the rim and rows of punctate. Grass temper to clay could be discerned on sherds from most spits [N = 53]. Mean thickness - 5.3mm. 95 sherds are burnished. **[182 sherds total at site.]**	0
219	**Blydefontein** inland rock shelter site Northern Cape **[29, 30]**	-31,25S 25,1E	Hunter-gatherer	HG/C42	1305±31 [SMU-1850]	charcoal	AD682-837	**1**	0	**N18** [mostly incomplete], a shift to larger beads occurs, manufacturing present.	-	Mostly plain grass-tempered sherds. A single grit spout fragment was recovered.	0
				HG/C2	**1505±50 [GrA-15195]**	**fibre ceramic**	AD552-645						
				HG/CAU2/B27	**1238±28 [D-AMS-1228]**	**bone**	AD775-885						
				CPB/C10	1255±109 [MSU-1925]	charcoal	AD683-960						

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				HG/C42	1305±31 [SMU-1850]	charcoal	AD682-837						
221	**Haaskraal** inland rock shelter site Northern Cape **[78, 79, 80]**	-31,55S 24,23333333E	Hunter-gatherer and pastoralist [part of Phase 1]	level 8, sq. F5	**1570±50 [GrA-13542]**	**fibre in pottery**	AD468-595	**1**	0	**N5** [layers 8-7], manufacturing was not reported for site.	0	Khoi sherds almost absent. Very little decorated pottery. Undecorated grass tempered-sherds predominate. 1 internally reinforced lug similar to Cape Coastal Ware except that it is grass-tempered.	0
				level 10, sq. M13	**1400±50 [GrA-13540]**	**fibre in pottery**	AD636-765						
				level 9, Sq. E	1180±70 [SMU-1789]	charcoal	AD785-991						
				level 7, sq. J2	1140±60 [SMU-1790]	charcoal	AD891-1014		1-piece decorated fragment.			undecorated grass-tempered sherds predominate but non-rocker stamp sherds persist. Khoi sherds present.	
234	**Wonderwerk** large inland cave site Northern Cape **[86]**	-28,84583333S 23,55527778E	Pastoralist [Doornfontein]	Layer 2b Thackeray Exc. 1979	1210±50 [Pta-2779]	charcoal	AD777-967	**3**	Decorated ostrich eggshell fragments [nq]	**N35**, manufacturing present at site.	leather [1 piece]	5.6mm thick. All grit tempered and undecorated. **[1 sherd]**	sheep/goat [1N]
235	**Blinkklipkop [BKK]** inland prehistoric specularite mine Northern Cape **[136]**	-28,30277778S 23,11666667E	Pastoralist [Doornfontein]	layer 5s/t	1150±40 [Pta-2835]	charcoal	AD894-988	**3**	0	**N1**, minimal evidence for manufacturing at site.	0	5.5mm thick. 1 spout sherd present and 1 body sherd with stamping. Layer 5b has some rippled sherds, 5d-e also show rippled sherds. All sherds are mineral tempered.	sheep/goat [1N]
				layer 5P	1160±50 [Pta-2840]	charcoal	AD891-987						
236	**Dikbosch [Area B]** inland rock shelter Northern Cape **[86]**	-28,65222222S 23,9025E	Pastoralist [Doornfontein]	DKB1, Area B, level III	1570±40 [Pta-3412]	charcoal	AD478-592	**3**	Decorated ostrich eggshell fragments [nq]	**N41**, 4.05mm, manufacturing present at site.	0	All sherds are grit-tempered and undecorated.	0

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238	**Little Witkrans** inland rock shelter Northern Cape **[86]**	-27,66111111S 24,6125E	Pastoralist [Doornfontein]	5-10cm	1490±40 [Pta-2447]	charcoal	AD589-645	**3**	decorated fragments [nq] and 1 flask rim piece	**N11**, bead manufacturing present at site.	0	All have grit-temper, black in colour and undecorated. **[15 sherds total at site]**	0
239	**Limerock 1** small inland rock shelter Northern Cape **[86, 137]**	-28,55027778S 24,13333333E	Pastoralist [Doornfontein]	Level III [PU-C]	1620±50 [Pta-1621]	charcoal	AD422-536	**3**	10 decorated fragments and 1 undecorated flask rim piece.	**N16**, 4,69±0.69 mm, manufacturing present.	0	All fine grit [with no grass inclusions]. Mean thickness of 5.71±1.8mm. Two decorated sherds with cross -hatch and one body sherd with what appears to have been a series of wide shallow impressions producing an undulating affect. **[7 sherds]**	sheep/goat [1M]
240	**Limerock 2** large inland rock shelter Northern Cape **[86, 137]**	-28,55027778S 24,13333333E	Pastoralist [Doornfontein]	Level V [PU-A]	1430±50 [Pta-1759]	charcoal	AD600-680	**3**	2 decorated fragments.	**N 28**, 4.11±0.88mm, manufacturing present at site		6.50mm thick, all grit-tempered and undecorated	
245	**Atlantic Beach 1** in-situ coastal shell midden Western Cape **[138]**	-33,86305556S 18,50888889E	Pastoralist	Lowermost Midden	1825±15 [Pta-7800]	shell	AD630-804	**3**	8 undecorated flask mouth fragments [layers 3-2]	**N12** [layers 3-2], manufacturing seems to be present.	0	The pottery falls under 'Kasteelberg' Spouted Impressed Ware. Although no spouts were recovered at the site. Only 3 decorated sherds were identified. **[212 sherds, layers 3 -2]**	Sheep [77N]
				Top Midden	1800±50 [Pta-7792]	shell	AD650-850						
257	**Tortoise Cave** small coastal rock shelter Western Cape	-32,32694444S 18,36027778E	unspecified LSA group	Layer 3a	1680±50 [Pta-3312]	charcoal	AD361-517	**2**	2 undecorated flask mouth fragments [layer 2b and 2a].	**N 166**[layer 3a to 2a], minimal evidence for bead manufacture.	fibre cordage [two strands twisted]. Some appear to be knotted.	Great majority of pieces are black in colour. Thickness varies: 5.5 to 12.5 mm. Coarse admixture of quartz	sheep [50N]
				Layer 3a	1620±50 [Pta-3310]	charcoal	AD422-536						

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	[40, 139]			Layer 3a	1610±50 [Pta-3311]	charcoal	AD425-541					to clay. None are decorated **[19 sherds layers 3a to 2a]**	
				Layer 3a	1590±50 [Pta-5817]	charcoal	AD440-575						
				Layer 2b	1580±50 [Pta-3309]	charcoal	AD443-584						
				Layer 2a	1660±45 [Pta-5855]	charcoal	AD388-518						
267	**Diepkloof Rock Shelter** large coastal rock shelter Western Cape **[140]**	-32,39139722S 18,457625E	Hunter-gatherer mix pastoralist	Main Ash Concentration	1590±45 [GaK-4595]	charcoal	AD442-574	**2**	0	**N 127 [total at site]**, manufacturing present.	0	Only 7 decorated with 1 possible spout fragment. 20% of the sherds are burnished with red-ochre. Decoration includes: comb-stamp or shell-stamped impressions on rims or horizontal linear grooves. Coarse quartz temper. Cape Coastal Ware.	sheep [65N total at site]
269	**Boomplaas** inland rock shelter southern Cape **[90, 91]**	-33,38333333S 22,18333333E	Hunter-gatherer-livestock-keepers	DGL Member	1630±50 [UW-337]	charcoal	AD417-531	**2**	1 decorated fragment with no mouth pieces.	**N30, [**Upper level sees a decrease in number of beads]. Only 3 unfinished beads, minimal evidence for manufacturing at site.	0	Sherd thickness: 6.0±1.26mm. Spout fragment with incised lines. 49 decorated sherds from sample. **[652 sherds.]**	sheep [10M]
				Top of BLD2 member [stone lined hearth] [Second date for BLD2 Herder level]	1510±75 [Uw-307]	charcoal	AD521-655		5 incised decorated fragments and the rim piece of a container.	**N61** [refer to BLD2 earlier radiocarbon reading.], 1 unfinished bead, minimal evidence for manufacturing at site.	0	At least one bowl may be represented, but the majority of the sherds appear to come from wide-mouthed pots. No lugs or bosses were found [**45 sherds]**	sheep [4M]
271	**Bonteberg Shelter** small rock shelter	-34,2S 18,38333333E	Hunter-gatherer	-	2050±95 [SR-166]	marine shell	AD364-636	**3**	0	**N87**, mostly between 4-5mm, manufacturing present on site.	0	Sherds are from 4 to 10mm thick and the clay usually has some inclusion of	0

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	Western Cape **[141, 142]**											sand as filler. There is no decoration. 1 internally reinforced horizontally pierced lug, another broken lug. Typical of Cape Coastal Pottery. [32 sherds]	
280	**Simon se Klip [SSK]** stone walling site hill top Western Cape **[143]**	-32,16166667S 18,33333333E	Pastoralist [single occupation AD820]	sq. F9	**1440±60 [GX-32343]**	**marine shell**	AD632-756	**3**	0	0	0	Typically, thin-walled, some red burnished. One rim sherd is from a small pot. Another may possibly be part of a spout rim. The pottery assemblage may form part of the early ceramic assemblages from the Western Cape, Spouted Incised Ware **[12 sherds]**	0
				sq. F5	**1310±60 [GX-32342]**	**marine shell**	AD731-881						
				sq. F2	**1210±60 [GX-32241]**	**marine shell**	AD849-1001						
281	**Witklip [WK]** small coastal rock shelter Western Cape **[92]**	-32,91694444S 17,98361111E	Hunter-gatherer	Unit 3 [Grey Ashy Soil with Shell]	1380±50 [Pta-4608]	charcoal	AD648-765	**2**	0	**N54**, 4.7±0.8mm, bead manufacturing not reported for site.	0	Ceramics conform to the Kasteelberg ceramic sequence and Rudner's Cape Coastal Ware. Mean thickness is 6.04mm. Shell impression is present. Small mouth openings suggesting spouts were present. **[13 sherds]**	0
285d	**KBDe** open air site located on hilltop Western Cape **[144, 145**	-32,79575278S 17,96759444E	Pastoralist	level 12	1760±50 [Pta-8095]	marine shell	AD 697-1054 [mean]	**2**	0	**N93**, 6.67mm, manufacturing present based on unfinished beads.	0	Spouted pots with shell edge impressed decoration [SPIMP] or incised decoration [SPINC].	sheep/goat [929N], cattle [56N]
				level 14	1650±60 [Pta-8093]	marine shell							
				level 8	1690±50 [Pta-8092]	marine shell							

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				level 4	1690±50 [Pta-8091]	marine shell							
				level 1	1570±50 [Pta-8090]	marine shell							
				level 3	1550±50 [Pta-8094]	marine shell							
285c	**KBD** inland open-air occupation site Western Cape **[146]**	-32,79575278S 17,96759444E	Pastoralist	-	1780±70 [Pta-9134]	marine shell	AD660-886	**3**	0	**nq.** 7 - 8mm, manufacturing not reported for site.	0	SPINC with 2 incised and 1 spout	0
					1730±50 [Pta-9076]	marine shell	AD700-905						
285e	**KBE** small inland rock shelter Western Cape **[93, 147]**	-32,79575278S 17,96759444E	Pastoralist	LBWC [depth 45 - 55cm]	1670±60	charcoal	AD368-520	**2**	0	**N25**, 7 - 8mm, manufacturing present.	0	Pottery assemblage is similar to Kasteelberg A. Spouted pots with shell edge impressed decoration [SPIMP] or incised decoration [SPINC] **[153 sherds]**	sheep/goat [35N] [total for site]
				SGWA [depth 18 - 28cm]]	1360±50 [Pta-7455]	charcoal	AD659-765						
				surface	1800±50 [Pta-9107]	marine shell	AD650-850						
286	**Kasteelberg A [KBA]** open air boulder site located on hilltop Western Cape **[93, 145, 148]**	-32,79575278S 17,96759444E	Pastoralist	A20: 20 -30cm	1230±40 [Pta-5937]	charcoal	AD773-892	**1**	0	**N821** [measurable beads from UB/UCT excavations], 6.5mm, no manufacturing present at site.	0	Spouted pots with shell edge impressed decoration [SPIMP] or incised decoration [SPINC].	sheep [72N], cattle [4N]
				A20: 20 - 30cm	**1630±60 [OxA-3864]**	**sheep bone**	AD410-543						
				A20: 20 - 30cm	**1430±55 [OxA-3865]**	**sheep bone**	AD598-681						
287	**Kasteelberg B [KBB]** open air site [base of hill] Western Cape **[93]**	-32,79575278S 17,96759444E	Pastoralist	B4:158cm	1220±45 [Pta-3998]	charcoal	AD774-960	**2**	0	**N2004**,7±1.2mm, beads more common in the lower layers [lower KBB], manufacturing took place at site.	0	[Lower KBB] Spouted pots with shell edge impressed decoration [SPIMP] or incised decoration [SPINC].	sheep [138M], cattle [7M] [total at site]
				B4:173cm	1300±60 [Pta-3995]	charcoal	AD682-857						

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288	**Kasteelberg C [KBC]** small rock shelter Western Cape **[93]**	-32,79575278S 17,96759444E	Hunter-gatherer	top of middle	1270±50 [Pta-3785]	charcoal	AD692-883	**2**	0	**nq**, 7mm, manufacturing not reported for site.	0	Pottery assemblage is similar to Kasteelberg A. Spouted pots with shell edge impressed decoration [SPIMP] or incised decoration [SPINC]	sheep [38N] [total for site]
293	**Byneskranskop** coastal cave site Western Cape **[94, 95]**	-34,58333333S 19,46666667E	Pastoralist[?]	Layer 1	**1370±60 [OxA-3863]**	**sheep bone**	AD652-765	**3**	Total for layer 1: 0 flask mouth fragments. 9 decorated pieces.	**N 824**, 4-8mm, manufacturing present at site.	kelp [Eckonia maxima]	At least 9 different vessels are present, of which two or possibly 3, were spouted and one had a boss or bosses. Shell impressed decoration present as well as 'ripple' rims. Sherds range in thickness from 2-10mm with a mean of 5.4±1.3mm. All show quartz grit. 15 sherds contain carbonised organic material mixed into the clay [possible accidental inclusion?]. **[Total for layer 1: 426 sherds]**	sheep [11M]
294	**Die Kelders [DK1]** coastal cave site Western Cape **[95, 97]**	-34,53555556S 19,37583333E	hunter-gatherer-fishers and possibly pastoralist	layer 4	1480±55 [UW-291]	charcoal	AD576-656	**1**	0	**N560** [layers 2-4], minimal evidence for manufacturing	Modified tortoise carapace bowls. 1 possible marine shell container.	Layer 2 included the upper portions and base of a fine spouted pot with a comb-stamped rim and extruded bosses on the shoulder with some shell impressed decoration. The outer surface appears to be stained with red ochre [burnished]. More spout fragments were recovered from the	sheep [20M] [layers2-4], cattle c.f. [1M]
				Layer 3	1590±80 [GaK-3956]	charcoal	AD424-586						
				Layer 2	1465±100 [GX-1685]	charcoal	AD520-765						
				layer 7	**1325±60 [OxA-3860]**	**sheep bone**	AD670-840						
				Layer 7	**1290±60 [OxA-3961]**	**sheep bone**	AD685-860						

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												upper levels. The sherds appear to have come from larger, less well-made vessels. They are black, unburnished and partly coated with carbonized material. Continuity exists with the same use of quartz grain inclusions as temper with layer 12.	
295	**Klein Kliphuis [KKH]** inland rock shelter Western Cape **[149]**	-32,11666667S 18,85E	Hunter-gatherer	Bedding Layer	1230±50 [Pta-4672]	charcoal	AD771-954	**2**	0	**N8** [total at site], both large and small beads are present. Manufacturing present at site.	0	Pottery has fine quartz temper and red ochre is present. No diagnostic pieces were present **[8 sherds]**	0
296	**Smitswinkelbaai** coastal cave site Western Cape **[150]**	-34,26666667S 18,46666667E	unspecified LSA groups	Layer 9	1420±35 [Pta-2198]	charcoal	AD641-677	**3**	0	**N9**, manufacturing not reported at site.	0	High degree of fragmentation. Cape Coastal Pottery **[51 sherds]**	0
				Layer 4	1175±35 [Pta-2200]	charcoal	AD890-970						
297	**Duiker Eiland** Midden Western Cape **[151]**	-32,71666667S 17,91666667E	Hunter-gatherer	layer 1	1700±50 [Pta-1581]	marine shell	AD730-944	**3**	0	0	0	Pottery present mostly near the surface. 1 spout fragment present**. [4 sherds]**	0
302a	**Elands Bay Cave** coastal cave site Western Cape **[47, 153, 154]**	-32,31001944S 18,35200278E	Hunters-with-sheep or pastoralist	GADD, Sq. B9	1680±40 [Pta-5815]	charcoal	AD363-471	**2**	0	**nq**, beads show an increase to greater than 5mm.	string and grass bedding [*Zostera capensis*]	Pottery present	Total for units 1 -22: Sheep [13N/3M]
				BHOP	1520±80 [GaK-4337]	charcoal	AD497-652						
				BUTH	1400±50	-	AD636-765						

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				BAR	1350±20	-	AD674-765						
				LIAP	1310±40	-	AD680-835						
				BRST, Sq. C8	1280±50 [Pta-5819]	charcoal	AD691-876						
303	**Rautenbach's Cave** small cave Eastern Cape **[155]**	-33,51666667S 23,7E	unspecified LSA groups	Grey ashy deposits	1620±40 [Pta-4611]	charcoal	AD429-527	**3**	0	**N18**, manufacturing present on site.	small grass plugs, matting and netting [*Cyperus textilis*], cordage, leather [1 fragment]	4 rims and 1 decorated piece. **[63 sherds]**	0
304	**Nuwekloof Shelter** small rock shelter Eastern Cape **[155]**	-33,51666667S 23,65E	unspecified LSA groups	Pit	1140±50 [Pta-4617]	charcoal	AD893-994	**3**	0	**N33**, manufacturing present at site.	tortoise carapace bowl, a few pieces of leather, 1 piece of cordage, netting and matting.	1 rim and 1 lug were recovered. **[38 sherds]**	0
305	**Havens Cave** inland cave site and human burial Eastern Cape **[48, 54, 156]**	-33,68333333S 24,56666667E	Hunter-gatherer	BED (storage pit)	1280±50 [Pta-4610]	charcoal	AD691-876	**2**	7 decorated pieces	**N2**, no manufacturing took place at the site.	cordage [*cyperus textilis*] [matjiesgoed]; matting, netting; leather	1 rim piece and 1 decorated piece. **[13 sherds]**	0
				infant (foetal?) burial	between 1280±50 [Pta-4610] and 190±80	charcoal	between AD691 and AD1891	**3**	0	**N18** (associated with burial)	tortoise carapace (*Homopus areolatus*)	0	0
306a	**Kablejous River Mouth 1A (KR/SM1A)** coastal open-air shell midden Eastern Cape **[49]**	-34,00565278S 24,93393611E	Pastoralist	surface	1560±40	charcoal	AD481-601	**3**	0	**N10**, manufacturing not reported for site.	0	Khoe type pottery **[130 sherds]**	sheep [6N]
315	**Scotts Cave** rock shelter Eastern Cape	-33,73333333S 25,71666667E	possible Herder stock post	Hearth on bedrock, sq. H4	1190±100 [SR-82]	charcoal	AD773-991	**3**	0	0	leather; knots possibly related to netting [possibly extends back as far a 5000 BP]	Cape Coastal Pottery	sheep

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4.4.3. Map 3: cal AD 311- 911

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	[51]												
316	**Nelson Bay Cave** large coastal cave site Western Cape **[52, 53]**	-34,10277778S 23,375E	hunter-gatherer	Unit 29	**1100±80 [OxA-873]**	**sheep bone**	AD888-1127	**1**	0	**N9**, manufacturing not reported at site.	tortoise carapace bowls are confined to the deposits above Unit 60.	Pottery is present.	sheep [13N] [Units 22-29]
328	**Welgeluk** inland rock shelter Eastern Cape **[103]**	-32,91263889S 26,42444444E	Hunter-gatherer		1360±50 [Pta-3960]	charcoal	AD659-765	**3**	0	**nq**, not reported in its entirety	0	A thin-walled burnished red ochre ware, decorated with showed grooved or impressed bands. Some sherds suggest globular pots with necks with no indication of lugs. [Referred to as Albany Ware as being distinct from Khoe Cape Coastal Ware]. A plain quartz tempered ware, bag-shaped pots.	0
336	**Roosfontein** inland rock shelter Free State **[158, 159, 160]**	-28,81666667S 27,73333333E	Hunter-gatherers in contact with pastoralists	Black Ash	1290±50 [Pta-5931]	charcoal	AD685-858	**3**	0	0	0	The majority of sherds in this assemblage were grit-tempered but some had small quantities of grass. Small bowl shape and small pots present.2 sherds painted in ochre**. [213 sherds total at site]**	0
344	**Clarke's Shelter** inland small open rock shelter KwaZulu-Natal **[105]**	-29,02083333S 29,31611111E	Hunter-gatherer	layer 2 (Pale Brown Sand)	1580±50 [Pta-2973]	charcoal	AD443-584	**3**	0	0	0	4 u-shaped pots and 2 bag-shaped pots. Thicker sherds in layer 2 indicate storage vessels. Apart from the thicker-sherds, the thinner-sherds	0

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												display black-to-grey colour. May be of Later Farming Community Ware or of Pre-agriculturalist ware **[38 sherds]**	
345	**Gehle Shelter** medium sized inland rock shelter KwaZulu-Natal **[161]**	-29,12972222S 29,57277778E	Hunter-gatherer	Layer 1 (Hearth MO1)	1280±50 [Pta-3242]	charcoal	AD691-876	**3**	0	0	0	undiagnostic **[12 sherds total layer 1]**	0
346	**Mbabane Shelter** inland rock shelter KwaZulu-Natal **[162]**	-28,75555556S 30,37416667E	Hunter-gatherer contact with farmers	Layer 4 (SBS1 bottom)	1520±50 [Pta-3678]	charcoal	AD545-639	**3**	0	**N3**, majority being 4-5mm, no manufacturing present on site.	0	Decorated pottery similar to Msuluzi Ware [Early Farmer Ware]. A subspherical bowl was recovered [post-dates AD700] **[20 sherds].**	0
352	**Collingham Shelter** inland rock shelter KwaZulu- Natal **[106]**	-29,45972222S 29,79583333E	Hunter-gatherer	TBS (uppermost deposit)	1260±50 [Pta-5408]	charcoal	AD694-888	**2**	0	0	10 pieces of gourd [1 fragment ochre stained and 2 pieces have been stitched together by twine.], string, 14 pieces of leather of which some are remains of knotted thongs.	Pottery from TBS appears to be thicker than the underlaying units. Mean thickness: 7.94±2.53mm for 9 sherds.	0
353	**KwaThwaleyakhe Shelter** inland rock shelter KwaZulu-Natal **[163]**	-28,91361111S 30,44361111E	Hunter-gatherer contact with farmers	Layer 2 (TBS1)	1290±50 [Pta-5350]	charcoal	AD685-858	**3**	0	**N3**, no manufacturing reported from site.	0	Ntshekane type pottery [Farmer Ware]	0
355	**Mzinyashana 1** inland rock shelter KwaZulu-Natal **[60, 164]**	-28,31416667S 30,47222222E	Hunter-gatherer with possible farmer contact	Layer 5	1520±20 [Pta-6543]	charcoal	AD579-630	**3**	0	0	0	Generally thinner than overlying pottery which is thick-walled **[34 sherds]**	0

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356	**iNkolimahashi Shelter** inland rock shelter KwaZulu-Natal **[107, 165]**	-28,79416667S 30,18055556E	Hunter-gatherer with farmer contacts	Layer 5	1600±50 [Pta-7231]	charcoal	AD431-568	**3**	0	0	0	Sherds similar to first millennium AD pottery [Farmer] [**34 sherds layers 5-4]**	0
				Layer 5	1580±50 [Pta-7230]	charcoal	AD443-584						
				Layer 4	1170±50 [Pta-7229]	charcoal	AD886-987						
359	**Umbeli Belli Shelter** coastal rock shelter KwaZulu-Natal **[65, 109]**	-30,68583333S 30,27083333E	Hunter-gatherer	Layer 2 [Ashy Lens]	1140±50 [Pta-2825]	charcoal	AD893-994	**2**	0	**N4**, manufacturing not reported for site.			
365	**Jubilee Shelter** inland rock shelter site Gauteng **[113]**	-25,69166667S 27,91333333E	Hunter-gatherer with farmer contacts	RR, sq. D2	1350±120 [Wits-1399]	charcoal	AD643-877	**2**	0	**N1**, minimal evidence for manufacturing at site.	0	An Early Farmer sherd with multiple herringbone decoration on the neck and shoulder.	0
375	**Balerno Main Shelter** inland rock shelter Limpopo **[61]**	-22,265S 29,18805556E	Hunter-gatherer with farmer contacts	BRA 55-60	1340±40 [Pta-8603]	charcoal	AD678-765	**2**	0	**N98 [**included in the count are rough-outs]. The assemblage contains more complete beads than partially manufactured beads.	0	Several decorated sherds from BRA, BRA 45-50 and BRA 50 -55 have been identified as belonging to particular ceramic traditions including Mzonjani and Bambata. 1 sherd is a jar fragment with hatched pattern from BRA.	0
376	**Olieboomspoort [OBP]** large inland rock shelter Limpopo **[63]**	-23,87833333S 27,63805556E	Hunter-gatherer contact with farmers and possibly pastoralists	Layer 6, sq. C5	1600±50 [Pta-8032]	charcoal	AD431-568	**3**	decorated fragments of ostrich eggshell present [some of which are ochre stained].	**N655** [layer 3], many of the beads are ochre stained. Manufacturing present at site.	gourd, modified tortoise carapace bowls [present at site], *Strychbos* fragments may have been derived from containers [use for holding pigments, ochre stained]. The	**4 Bambata sherds, 1 Happy Rest sherd, 5 Eiland sherds, 3 Broadhurst sherds, 7 Icon sherds.** Bambata sherds are generally jar form with ochre staining	0 [cattle and sheep/goat were recovered from the upper levels]
				Layer 3, sq. C3	1530±40 [Pta-7799]	charcoal	AD546-631						
				Layer 6, sq. F5	1330±50 [Pta-7418]	charcoal	AD671-831						

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				Layer 2, sq. D5	1310±40 [Pta-7780]	charcoal	AD680-835				presence of decorated *Strycnos* shell was recorded by Cooke from Pomongwe Cave in the Upper Wilton/Farmer levels. These levels remain undated. Cooke suggests that the levels are largely disturbed [Cooke 1963].	whilst Icon sherds are bowl form also displaying ochre staining.	
396	**Likoaeng** inland open-air site Lesotho **[65, 116, 117, 118, 119]**	-29,73555556S 28,76305556E	Hunter-gatherer contact with farmers [Phase D]	layer I	1310±80 [Pta-7877]	wood charcoal	AD677-858	**1**	0	0	0	Msuluzi or Ndondonwane Sherd [Early Farmer Ware]	cattle [2N], sheep/goat [4N]
					1285±40 [GrA-23237]	**sheep**	AD690-859						
					1290±30 [GrA-26831]	iron	AD686-857						
397	**Sehonghong** large inland rock shelter Lesotho **[120, 121]**	-29,76666667S 28,78333333E	Hunter-gatherers [possible hunter-gatherer-livestock-keepers]	layer GAP [Carter et al. 1988 excavation.]	1400±50 [Pta-885]	charcoal	AD636-765	**2**	0	**N 25**, 4.84±1.02mm, 1 ostrich eggshell fragment and 6 incomplete beads. Manufacturing not present on site.	0	Pottery found in the top 3 units have a mean thickness of 7.8±1.6mm, grey-to-black in colour, grit-tempered and not well fired. Decoration is restricted to burnishing **[52 sherds]**	0
				layer GAP [pit at top]	1240±50 [Pta-6084]	charcoal	AD769-948						
48	**!Khuiseb Delta [Ward's Midden]** shell midden Namibia **[67]**	-23,21680556S 15,625E	Hunter-gatherer [?] [Pre-pastoralist phase]	-	1600±50 [Pta-4004]	charcoal	AD431-568	**F**	0	0	0	Globular with narrow mouths and rounded bases, upright neck. Decoration is present with some displaying vertically pierced lugs. No evidence of outer encrustation of soot caused by fire. Kinahan suggests pots were used	0

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												more for storage than for cooking.	
49	**!Khuiseb Delta [End Midden]** shell midden Namibia **[67]**	-23,21680556S 15,625E	Pre-pastoralist phase	-	1470±45 [Pta-4049]	charcoal	AD593-653	**F**	0	0	0	Globular with narrow mouths and rounded bases, upright neck. Decoration is present with some displaying vertically pierced lugs. No evidence of outer encrustation of soot caused by fire. Kinahan suggests pots were used more for storage than for cooking.	0
50	**!Khuiseb Delta [Liz's Midden]** shell midden Namibia **[67]**	-23,21680556S 15,625E	Hunter-gatherer [?] [Pre-pastoralist phase]	-	1170±50 [KN-3598]	charcoal	AD886-987	**F**	0	0	0	Globular with narrow mouths and rounded bases, upright neck. Decoration is present with some displaying vertically pierced lugs. No evidence of outer encrustation of soot caused by fire. Kinahan suggests pots were used more for storage than for cooking.	0
135	**KV2001/012** deflated coastal shell scatter Northern Cape **[22]**	-29,50130556S 17,05533333E	Hunter-gatherer [?] [Probable Group 1]	Area B	**1219±23 [OxA-22984]**	**ostrich eggshell**	AD779-950	**F**	2 undecorated 'flask' mouth fragments	**N44,** 9.37±1.36mm, manufacturing not reported for site.	0	0	0
159	**Buzz Shelter (VR005)** small coastal cave site	-31,52363889S 18,60027778E	unspecified LSA groups	Layer 2 (OII SW L3A)	**1646±25 [OxA-25352]**	**bone**	AD414-517	**F**	Painted fragments of ostrich eggshell.	**N12**, 4.20±0.34mm, minimal evidence for manufacturing at site.	Single fragmented tortoise shell bowl	A plain body sherd. [**1 sherd]**	0

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	Western Cape **[22, 77]**												
220	**Lame Sheep Shelter** inland rock shelter [extension of Abbot's Cave] Northern Cape **[88, 135]**	-31,45S 24,65E	Hunter-gatherer and pastoralist	-	1350±50 [Pta-6302]	-	AD670-766	**F**	0	**nq**, not reported in its entirety	0	Grass was the main tempering additive. Blood and fat absorbed into the grass fibre. Grass tempered plain ware. There is 1 solitary Khoi sherd below the grass tempered ware. [mostly bowl forms]	0
228	**Springbokoog [SBO]** 5 surface scatters Northern Cape **[34]**	-30,22770556S 21,53725556E	Hunter-gatherer [Swartkop] with pottery	SBO4/excavated surface	1270±50 [Pta-4103]	oes	AD692-883	**F**	0	nq, not reported in its entirety	0	pottery present [not reported in its entirety]	0
246	**Atlantic Beach 3** coastal shell midden Western Cape **[138]**	-33,86305556S 18,50888889E	Pastoralist	sq. B14	1490±50 [Pta-8797]	shell	AD630-1180	**F**	2 undecorated flask mouth fragments (1 complete). Recovered from Layer 2 and 3.	**N69** [total at site], manufacturing seems to be present.	0	A sherd shows affinities to the later style of De Hangen or Lugged Ware as identified from the upper occupations at Kasteelberg. 3 fragments of lugs were recovered from the site.	0
279	**Bakoond 1 [BK]** coastal shell midden site Western Cape **[46]**	-33,36502222S 18,16476944E		BKI, Spit 4, sq. F9	**2030±50 [Beta-233919]**	**marine shell**	AD418-625	**F**	Spit 3 contains a single undecorated mouth fragment.	**N5** [spits -4-6], 4.56mm, no manufacturing on site.	0	6.1mm thick, sherds seem to be thinner than at BKII. They are all very dark brown body sherds with quartz temper and most are very small. 1 sherd possibly belongs to LINC [Lugged Incised Ware] [6 sherds]	0

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298	**Pearly Beach Area** open shell midden site Western Cape **[152]**	-34,66666667S 19,5E	unspecified LSA groups	Hearth	1680±50 [Pta-1069]	charcoal	AD361-517	**F**	0	0	0	Pottery is present but context with single radiocarbon determination is not secure.	Sheep remains are present in the area.
310a	**Thysbaai 1 [TBW1]** coastal open-air shell midden Eastern Cape **[49]**	-34,18695556S 24,75183611E	unspecified LSA group [Wilton]	surface	1720±50 [Pta-8653]	marine shell	AD784-921	**F**	0	0	0	0	0
333	**Voigtspost O** saltpan site in shallow depression Free State **[157]**	-29,12833056S 27,37135556E	unspecified LSA groups	Layer 5	1220±50 [Pta-1483]	oes	AD774-961	**F**	0	0	0	Small undecorated black body sherds with smooth matt inner and outer surfaces with grit and grass temper. [**2 sherds from slope wash]**	0
398	**Siphiso Shelter** small inland rock shelter Eswatini **[122]**	-26,31388889S 31,975E	Hunter-gatherer	Stratum III	1940±370 [TX-5619]	bone	359BC-AD517	**F**		**N52** [Strata I-V], 5.59±0.856mm, manufacturing not reported for site.	0	7mm thick, dark-to-grey in colour. Grit-tempered. Some sherds show burnishing. A sherd resembles similar Swazi pottery. Possible pre-agriculturalist ware. **[7 sherds]**	0
290	**Steenberg's Cove** open boulder site Western Cape **[93]**	-32,16166667S 18,33333333E		Soily Midden [SM] [38-46cm depth]	1350±50 [Pta-4010]	charcoal	AD670-766	**F**	0	**N48**, manufacturing present at site.	0	Mean wall thickness is 6mm. **[219 sherds]**	sheep [6N]
				Loamy Shell Midden [LSM][18-34cm]	1280±50 [Pta-4012]	charcoal	AD691-876						

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4.4.4. Map 4: cal AD 912 – 1512

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Site Reference Number	*Site Name Type of site Region Source*	*Co-ordinates*	*Cultural Affiliation*	*Stratigraphic Context*	*Uncal. Radiocarbon Date [BP] and Lab ID*	*Material Dated*	*Cal. Radiocarbon date*	*Date grade*	*Ostrich eggshell flask and or decorated pieces description.*	*Ostrich eggshell bead data [quantity, mean diameter, and manufacturing]*	*Other organic Material recovered at site*	*Pottery at site and quantity of sherds present.*	*Livestock at site and quantity.*
2	**Oruwanje 95/1** inland rock shelter site Namibia **[2, 3]**	-18,30513056S 13,44698889E	unspecified LSA groups [Late Ceramic]	7/11c/-75	1120±55 [KN-5299]	charcoal	AD895-1021	**2**	0	**N43**, 5.4±1.1mm [return to a smaller diameter], manufacturing present on site.	0	Mean sherd thickness is 6.3mm with fine to medium grained quartz grit but coarse temper was used in the manufacture of thick-walled vessels. 1 handle or spout fragment. Colour is mostly black. Main type of decoration is 'channelled ware' which can be grooved horizontal or diagonal lines. 3 sherds show a complex herringbone pattern and another 2 sherds have comb-stamped decoration. 'Ripple Rims' are present in this phase but form part of one or two of the older ceramic assemblages at the site. Mostly likely Phase 3. **[63 sherds**]	goat [nq]
			unspecified LSA groups [Historical Phase]	4/10b/-10	530±30 [KN-4849]	charcoal	AD1416-1444		0	**N12**, 6.9±1.8mm, manufacturing present at site.	0	"Channelled Ware' present but association to the Historical Phase [1] is uncertain. [nq]	cattle [nq]
				7/12a/-45	383±24 [KIA-29257]	charcoal	AD1484-1623						
3	**Hartmann Valley 95/4** coastal plain boulder site with stone structures Namibia **[2]**	-17,50207778S 12,47924167E	Mixed: Unspecified LSA groups [Historical and Ceramic LSA]	53/50a/-70	860±35 [KN-5286]	charcoal	AD1205-1267	**2**	0	**N10**,10.78±3.17mm, manufacturing not reported for site.	0	Not distinguishable from Phase 2 ceramics. **[3 sherds]**	0
5	**Ovizorombuku 96/1** large rock shelter Namibia **[2]**	-17,04309444S 13,21597222E	unspecified LSA groups [Phase 2: Ceramic LSA]	20/20d/-90	1042±33 [UtC-8103]	charcoal	AD995-1131	**2**	0	**N6** [total for phase 2]; 5.0±0.6mm, no manufacturing present on site.	0	Assemblage is homogenous. Colour of sherds are grey to black or ochre. Temper is of quartz grit in high quantity. Most common decorative motif are incised horizontal or oblique lines. 1 herringbone like motif. Another distinct motif is the finger-nail impressions on a very thin-walled sherd. Mean wall thickness is 5.5±1.1mm. The profiles of the rim fragments are in two cases tapered with a narrow, rounded lip, the third rim becomes slightly wider and the lip is horizontally truncated. **[39 sherds]**	0
				20/21a/-85	940±30 [KN-5260]	wood	AD1051-1200						

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4.4.4. Map 4: cal AD 912 – 1512

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			unspecified LSA groups [Phase 1: Historical]	20/21a/-80	420±35 [KN-5372]	charcoal	AD1453-1616		0	0	A leather strap and a plaited string made of vegetable fibre	0	0
8	**Omungunda 99/1** large rock shelter Namibia **[2]**	-18,02492222S 13,78665278E	unspecified LSA groups [Phase 2: Late Ceramic LSA]	12/6a/-95	985±35 [KN-5289]	charcoal	AD1041-1148	**2**	0	**N59**, 4.9mm, manufacturing present on site.	0	Average wall thickness is 5.8mm. 31% of the sherds are black to grey and well fired. Quartz temper is fine to medium grain size. 13.3% of the pottery is decorated. 2 sherds display indented decoration and another a herringbone pattern. [163 sherds]	0
			unspecified LSA groups [Phase 1: Historical]	12/6a/-85	535±35 [KN-5455]	charcoal	AD1413-1443			**N2** [may be intrusive], manufacturing not reported for this phase of occupation at site.	0	These sherds are perhaps intrusions from underlaying Phase 2 levels. Late Ceramic LSA.	0
11	**N2002/7** stone circle site Namibia **[2]**	-18,29626667S 12,0262E	unspecified LSA group		1065±30 [KN-5564]	charcoal	AD991-1031	**2**	0	**N109**, 11.36±1.7mm, manufacturing present.	0	1 nearly complete pot displays an S-shaped profile with an outward projecting rim and a diameter of 171 mm. The decoration, a herringbone pattern bordered by a single line of stab marks, resembles sherds from late Ceramic LSA inventories from rock shelters in Kaokoland. [1**5 sherds with 1 nearly complete pot**]	0
23	**Maguams Andalusia** small rock shelter Namibia **[4, 6]**	-25,53333333S 16,86666667E	unspecified LSA groups	15-17cm	490±50 [KN-I.631]	charcoal	AD1415-1479	**3**	a few fragments of water containers	**nq**, not reported in its entirety	0	A few potsherds were found in the Upper Deposits	0
				25cm depth	380±50 [Pta-2662]	charcoal	AD1482-1626						
25	**Messum 1** rock shelter Namibia	-21,36666667S 14,28333333E	unspecified LSA groups [LSA Ceramic]	3-5cm	860±55 [KN-I.636]	charcoal	AD1184-1270	**3**	0	**nq,** not reported in its entirety	0	Pottery not described	0

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	[5]												
26	**Otjitati Rock Shelter** inland rock shelter Namibia **[167]**	-18,01666667S 12,68333333E	Pastoralist	LRBSL [top 0.1m]	670±50 [Pta-4362]	charcoal	AD1302-1392	**3**	0	**N5,** manufacturing not reported for site.	0	2 pieces of pottery with 1 rim sherd decorated with incision **[2 sherds]**	0
27	**Falls Rock Shelter** inland rock shelter Namibia **[66, 67, 68]**	-21,2S 14,55E	Pastoralist	Unit 10	730±70 [Wits-1100]	charcoal	AD1270-1390	**2**	0	**N114**, manufacturing present throughout the sequence at the site.	Wooden vessel, fibre and cordage, small leather pouches [x2]. 1 finely stitched closed by a leather thong containing an iron-tipped adze, string of iron and copper beads. A second leather pouch drawn together with a sinew thong.	1 rim with punctate decoration. **[31 sherds]**	sheep [3N]
37	**Geduld** inland rock shelter Namibia **[10, 11]**	-20,28333333S 15,83333333E	Hunters on the periphery of pastoralist groups. [Smith et al. 1995]	Level 1A, sq. C7	800±50 [Pta-4416]	charcoal	AD1225-1286	**2**	0	**N69**, 5.9±0.9mm, manufacturing present at site.	modified tortoise shell bowl [layer 2 below date], 2 ply rope, 3 of which were knotted.	2 spouts. Oblique rim incisions with exaggerated lip overhang. All sherds are well fired and vast majority are thin walled.	sheep [1N]
38	**Rosh Pinah Shelter** inland rock shelter Namibia **[168]**	-27,88333333S 16,68333333E	Hunter-gatherer	Pit 1-layer 2	760±50 [Pta-3521]	charcoal	AD1233-1379	**3**	1 decorated with incised lines. 10 flask mouth frags. [Total at site 38 flask mouth fragments].	**N4**, 6.5mm, manufacturing present at site.	A surface find of a modified piece of bark [*Aloe dichotoma*], semi-circular in shape may have possibly functioned as a container. [Not associated with radiocarbon date.]	Pottery is thin between 5-7mm, well-fired with a mixture of quartz, mica and grass temper. Red burnishing is present. A sherd with a rounded boss was found on the surface. **[104 sherds total at site].**	0

Appendix 4
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4.4.4. Map 4: cal AD 912 – 1512

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39	**Apollo 11** inland cave site Namibia **[4, 14]**	-27,75S 17,1E	unspecified LSA groups [Final LSA with pottery]	3-5cm	490±45 [KN-I.608]	charcoal	AD1417-1476	**3**	decorated pieces [context not provided].	**nq**, manufacturing present.	0	Pottery present.	0
				5-8cm	320±40 [Pta-1009]	charcoal	AD1510-1651						
44	**Numas Schlucht** inland cave site Namibia **[14]**	-21,11666667S 14,41666667E	unspecified LSA group	Pot	420±140 [Pta-2642]	carbonaceous material from pot	AD1413-1652	**2**	0	0	0	Grit-tempered pot [no further description]	0
47	**Wortel** shell middens Namibia **14, 15]**	-23,05S 14,46666667E	Pastoralist	Heath in midden KM2 [5cm depth]	400±50 [Pta-1645]	charcoal	AD1458-1623	**3**	0	**N58** [Jacobson's [1987] analysis [all of Wortel middens], 8.5±1.8mm, manufacturing not reported for site.	0	Pastoralist pottery	0
52	**!Khuiseb Delta** open coastal middens Namibia **[67]**	-23,21680556S 15,625E	Pastoralist		620±50 [KN-3599]	-	AD1317-1416	**3**	0	0	0	Pottery thickly encrusted with soot.	sheep bone [none positively identified].
					410±50 [KN-3600]	-	AD1453-1622						
					350±85 [KN-3597]	-	AD1480-1649						
54	**Lüderitz** Surface Namibia **[14]**	-26,63333333S 15,15E	unspecified	Pot	300±50 [Pta-2264]	soot from pot	AD1508-1792	**2**	0	0	0	Grit-tempered pot [no further description]	0
55	**Nautilus** Surface Namibia **[14]**	-26,61666667S 15,18333333E	unspecified	Pot	400±50 [Pta-2296]	soot from pot	AD1458-1623	**2**	0	0	0	Grit-tempered pot [no further description]	0

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56	**Conception Bay** human burial Namibia **[14]**	-24,01666667S 14,56666667E	Pastoralist	Pot	620±40 [Pta-902]	soot from pot	AD1320-1410	**2**	0	0	0	Carbonaceous matter scraped from surface of broken bag-shaped pot with pointed base, decorated neck and 2 externally applied, horizontally pierced lugs,	0
57	**Hottentot Bay** Surface Namibia **[14]**	-26,15S 14,96666667E	unspecified	Pot	490±50 [Pta-2295]	soot from pot	AD1415-1479	**2**	0	0	0	Grit-tempered pot [no further description]	0
59	**Kuidas Spring [KSC14]** stone circle site Namibia **[12, 13, 169]**	-20,63175S 13,84638889E	unconfirmed [hunters or pastoralists]	Level 3	952±24 [OxA-27893]	charcoal	AD1048-1180	**3**	0	**N14**, 4.5mm, manufacturing present at site.	0	Undecorated with black appearance. Mean wall thickness is 4.4mm and are considered thin-walled **[2 sherds]**	0
69	**Striped Giraffe Shelter** inland rock shelter Namibia **[14]**	-21,8S 15,7E	unspecified	Spit 3, 15-23cm dpeth	**370±40 [Pta-2230]**	**collagen from sheep skull**	AD1498-1627	**1**	0	**nq**, not reported in its entirety	0	undiagnostic	sheep [1N]
88	**Radiepolong** inland rock shelter Botswana **[72, 170, 171]**	-24,695625S 25,49153333E	hunter-gatherers-with-livestock and early contact with farmers.	Early Contact Phase	**820±70 [Beta-107605]** **800±60 [Beta-107604]**	**charcoal** **charcoal**	AD1188-1290 AD1215-1295	**2**	0	**N33**, 4-5.5mm.	0	Farmer Ware, Eiland Type. [**63 sherds]**	cattle [2N], sheep [1N]
89	**Thamaga 1** inland rock shelter Botswana **[72, 125]**	-24,69748611S 25,49193333E	Hunter-gatherer with Farmer contacts	20 - 30 cm depth	1190±90 [I-13,181]	charcoal	AD774-989	**2**	1 undecorated ostrich eggshell mouth fragment.	**N14**, 4 - 5.7mm, manufacturing present at site.	0	Pottery associated with early farmer ware.	sheep/goat was positively identified above this date at 10-20cm.

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94	**Toteng 1** open-air camp site with number of pits Botswana **[71, 72, 73, 74]**	-20,36793333S 22,95111111E	Hunter-gatherers with access to trade networks with Bantu-language speaking farmers or Hunter-gatherers-livestock-keepers with Bambata pottery.	sq. F, 35-40cm depth	**643±31 [AA-58187]**	**charcoal temper from undecorated body sherd.**	AD1318-1399	**1**		**N15** [SU3], 4.3mm, manufacturing present on site.	0	General description for both Toteng 1 and 3: Bambata Ware: 'The vessel forms include generally thin-walled, small bowls and jars…It can be seen that comb-stamping, sometimes reaching over the lip, is the most prevalent form of decoration evident on the sherds. There are also several examples that have incised lines...The temper of the Bambata sherds mainly includes grit while only 3 sherds have traces of charcoal. Bambata sherd thickness, including sherds from both sites, ranges from 4.0 to 10.1mm with a mean of 6.18mm **[Total for site: 240]**	cow [1N], sheep/goat c.f. [4N]
				50cm depth	610±45 [Pta-5531]	charcoal	AD1320-1420						
				sq. H. 40-45cm depth	**571±31 [AA-58188]**	**charcoal temper from undecorated body sherd.**	AD1400-1429						
95	**Toteng 3** open-air camp site Botswana **[71, 72, 73, 74]**	-20,36793333S 22,95111111E	Hunter-gatherers with access to trade networks with Bantu-language speaking farmers or Hunter-gatherers-livestock-keepers with Bambata pottery.	sq. 7 30-35cm depth	**1130±40**	**poorly preserved sheep/goat molar**	AD897-1014	**1**					
97	**Rhino Cave** large inland cave site Botswana **[172, 173]**	-18,73352222S 21,73250556E	Hunter-gatherer/Pastoralist	Test, sq. 7, 27cm below surface.	**980±80 [Beta-84719]**	**charcoal**	AD1028-1177	**2**	0	no ostrich eggshell was recovered from the site.	0	A few pottery sherds were recovered including a pointed base part of a pot. Charcoal-tempered.	0
108	**Gwenzi II Hill** large inland rock shelter site Zimbabwe **[174]**	-19,21315278S 32,34567222E	LSA with farmer pottery	Test Pit 6 [25cm depth]	**930±30 [GrA-26882]**	**charcoal**	AD1070-1210	**3**	0	**N1** [association to dates not made], manufacturing not present at site.	0	A few potsherds were found in the upper levels in all test pits. The majority of sherds are between 5 and 8mm thick. Later Farming Community Ware.	goat [1N]
				Test Pit 2 [15cm depth]	**685±30 [GrA-26883]**	**charcoal**	AD1300-1387						
				Test Pit 4 [15cm depth]	320±70 [Pta-9309]	charcoal	AD1497-1666						

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109	**Manjowe Main** inland rock shelter Zimbabwe **[174]**	-19,46666667S 32,63333333E	LSA with farmer pottery	Test Pit 2B [10-20cm depth]	900±50 [Pta-9311]	charcoal	AD1071-1261	**3**	0	0	0	67 of the sherds recovered at the site are less than 6mm thick but lack other diagnostic features. 3 sherds are decorated: 2 with stabs or punctate and the other with comb-stamping **[149 sherds].**	cattle c.f. [1N]
				Test Pit 5A [41-50cm depth]	**375±30 [GrA-26832]**	**charcoal**	AD1496-1625						
116	**Springbok Midden SK400 or KN2001/026** open-air coastal shell midden**.** Northern Cape **[21]**	-29,6825S 17,06302778E		lower layer	420±45 [Pta-9124]	Springbok bone	AD1450-1620	**3**	14 undecorated mouth openings	**N182**, 7.4±1.4mm, no manufacturing present.	0	1 rim sherd decorated with two parallel rows of impressed dots. Typical of Cape Coastal Ware dating to the last 700 years. No lugs present. Specularite admixture occurs with the sherds being quartz tempered [fine-to-coarse]. The mean thickness of the sherds is 6.0±1.7mm. [**160 sherds total at site]**	0
				surface layer	430±45 [Pta-9099]	Springbok bone	AD1447-1617						
119	**DP2004-014** open-air coastal shell midden Northern Cape **[22]**	-29,59966667S 17,0495E	Group 2 and Group 3		**1020±60 [GX-32060]**	**marine shell**	AD1350-1537	**3**	17 undecorated mouth openings	**N31**, 5.50 ± 0.8 mm, manufacturing present.	0	1 piece of dark brown pottery with medium to coarse clay and dense quartz temper. Undecorated. **[1 sherd]**	0
124	**DP2004/010** open-air coastal shell midden Northern Cape **[22]**	-29,59852778S 17,0305E	Group 2	Patch A sq. H16	**712±24 [OxA-24078]**	**charcoal**	AD1291-1380	**3**	5 undecorated mouth fragments.	**N20**, 6.38±1.99mm, manufacturing not reported for site.	0	4 sherds mean wall thickness of 5.51±0.34mm. Red slip, undecorated. Possible spout present.	0
132	**KN2005/067** several coastal in situ shell middens (patches) and tortoise burial Northern Cape **[22]**	-30,23961111S 17,25091667E	Group 2 and Group 3	Patch 1A Midden	**354±23 [OxA-24521]**	**bone**	AD1509-1627	**3**	22 undecorated mouth fragments for patches A and B. 2 refitted fragments of bead debris in Patch 1B were also engraved with parallel lines.	**N20** [5 Patch A and likely belonging to a single item], 15 Patch B], large and small beads present. Bead manufacturing debris present at site.	0	Majority of the sherds are undecorated. 5 sherds decorated with vertical impressions with an average wall thickness of 5.58±1.04mm. **[72 sherds for both patches].**	0
				Patch 1B Midden	**321±23 [OxA-24518]**	**bone**	AD1512-1649						

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139	**MB2005/013** dense coastal shell midden Northern Cape **[22]**	-30,46469444S 17,36127778E	Hunter-gatherer [Group 1]	I24 lower	**717±25 [OxA-24555]**	**bone**	AD1289-1379	**3**	5 undecorated mouth fragments.	**N8,** 6.02±0.52mm, manufacturing not reported for site.	0	1 plain rim. Sherds average wall thickness is 5.36±1.02mm. **[1 sherd]**	0
145	**SK2001/039** coastal shell midden Northern Cape **[22]**	-29,68327778S 17,06422222E	unspecified LSA groups [Group 1 and 3]	J33	**609±25 [OxA-24525]** **606±25 [OxA-24524]**	**Bone [same sample]**	AD1326-1411 AD1326-1414	**3**	2 undecorated mouth fragments.	0	0	1 flared neck decorated with small impressions. 5.71±0.61mm mean wall thickness. Heavy residue adhering to the outside. 2 sherds show evidence of coil manufacture. **[4 sherds]**	0
146	**SK2005/057A** small coastal midden site Northern Cape **[22]**	-29,68861111S 17,06352778E	unspecified LSA groups [Group 2]	Y22 Hearth	400±22 [OxA-22981]	charcoal	AD1463-1616	**3**	2 refitting undecorated mouth fragments.	**N26**, 5.58±0.41mm, manufacturing fragments present at site.	0	Rim sherd decorated with two rows of impressions. Majority is undecorated. [**86 sherds]**	0
150	**SK2005/096** coastal in situ shell midden Northern Cape **[22]**	-29,68886111S 17,06427778E	unspecified LSA groups [Group 1 and 3]	Patch A Patch A	**611±23 [OxA-22974]** **654±23 [OxA-22975]**	**Bone [same sample]**	AD1326-1410 AD1318-1394	**3**	1 undecorated mouth fragment and 1 engraved fragment - single incised line.	**N2**, 6.04±0.83mm, no evidence for manufacturing at site.	0	All plain body sherds likely from the same vessel with a mean wall thickness of 5.92±0.47mm. Residue appears to be adhering to the inner sides of the sherds. **[10 sherds]**	0
158	**Reception Shelter (VR001)** small coastal cave site Western Cape **[22, 77]**	-31,526S 18,60111111E	unspecified LSA group [Group 3]	Layer 6 Top Layer 5 (middle)	828±44 [AA-89909] 474±22 [OxA-22982]	bone sticks	AD1220-1275 AD1439-1459	**3**	12 painted fragments of ostrich eggshell 0	**N17**, 5.82±0.95mm, minimal evidence for bead manufacture at site.	Two pieces of string, both tied in loops, seem to be made of grass but with fibres of different thicknesses. No braiding occurs—the fibres simply run parallel to one another. Although not easily measured, the loops, if pulled taught, would be	Painted red below lip. This layer is the only one to include ochre sherds with 3 of the 11 being painted. Wall thickness: 6.01±1.63mm **[11 sherds]**	sheep/goat

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											between 50 mm and 90 mm long. Similar un-braided string was found at Diepkloof Rock Shelter		
166	**Bethelsklip** inland open-air site Northern Cape **[23, 133]**	-30,37203056S 17,94696944E	Pastoralist	BLL2 (59cm)	800±50 [Pta-3512]	charcoal	AD1225-1286	**2**	1 decorated piece present.	**nq**, 7mm	0	Lugged and necked vessels present. A spout was also recovered.	sheep/goat [2N]
				BL (10cm)	360±40 [Pta-4741]	charcoal	AD1502-1630						
167	**Ai Tomas** coastal boulder site Northern Cape **[23, 133]**	-28,58333333S 17,08333333E	Pastoralist	Area 1 (BL or GBS)	420±50 [Pta-5458]	charcoal	AD1449-1621	**2**	none (but 1 decorated fragment found in the area from SBH Unit (upper unit)	**N10**, 6.1mm, manufacturing present.	0	Lugged vessels present between 1980BP and 330 BP [uncal.] A sherd with drilled holes [repair work] was also present. [**Total for Area 2: 59 sherds, Unit SLV: 26 sherds]**	sheep/goat
				Area 2 (SLS2 or SLV)	330±45 [Pta-5452]	charcoal	AD1508-1621						
172	**Grootdrink** surface and human burial Northern Cape **[25, 177]**	-28,56666667S 21,75E		surface	295±32 [Pta-360]	soot from pot	AD1513-1668	**3**	Rudner [1971]: engraved containers	beads associated with burial	0	grave goods, Another pot with reinforced lugs, shallow stone bowl and stone smoking pipes.	0
184	**Droegrond** surface site Northern Cape **[26]**	-29,12333333S 20,26E	Pastoralist	DrB [below 20cm]	400±120 [Pta-2396]	charcoal	AD1442-1646	**3**	2 decorated pieces above 20cm.	**N48**, none of the beads are smaller than 4.3mm, manufacturing present at site.	0	Pottery was made from grass tempered clay with high mica content. All sherds are highly fragmented. Both internally and externally reinforced lugs were found. Decoration was restricted to the rim or upper portion of the neck and was either a simple impression along the rim or minimally hatched by incision. Average wall thickness = 5 - 6mm.	0
197a	**Vlermuisgat** inland cave site Northern Cape	-30,910375S 22,23678333E	Hunter-gatherer	Layer 5	480±50 [Pta-9510]	charcoal	AD1419-1489	**2**	Total at site: 10 fragments of decorated ostrich eggshell. 2 flask	**N5**, 5.6±0.4mm, minimal evidence for manufacturing at site.	0	Majority of sherds came from layer 6. 7 rim sherds and 34 body sherds all undecorated and have a mean wall thickness of 6.5mm. 9 sherds were	0

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	[27, 28]								mouth fragments were also recovered.			grass tempered. Almost all of the sherds are black burnished **[41 sherds]**	
214	**Vergelegen 179W [VLG179]** inland surface site Northern Cape **[80, 178]**	-31,68619722S 24,18769722E	Hunter-gatherer-stock-keepers	surface	**270±100 [Pta-6031]**	**pottery (fibre)**	AD1502-1877	**1**	0	0	0	grass-tempered lug	0
215	**Niekerksfontein 64 [NIE64]** inland surface site Northern Cape **[80, 178]**	-31,56953056S 23,96466667E	Hunter-gatherer-stock-keepers	surface	**350±50 [Pta-5364]**	**pottery (fibre)**	AD1502-1639	**1**	0	0	0	Double punctate fibre tempered ware. Grit-tempered lug present.	0
219	**Blydefontein** inland rock shelter site Northern Cape **[29, 30, 31, 32]**	-31,25S 25,1E	Hunter-gatherer-stock-keepers	HG/CAU2/ B27	**1097±24 [OxA-27366]**	**DNA tested bone [sheep]**	AD989-1018	**1**	0	**N18** [mostly incomplete], a shift to larger beads occurs, manufacturing present.	0	Plain grass-tempered ware. Khoe sherds no longer occur at the site.	sheep [DNA tested and directly dated]
				HG/C2	844±119 [SMU-1902]	charcoal	AD1048-1375						
				HG/CAUl/D 2	**556±24 [D-AMS-1227]**	**bone**	AD1408-1431						
				HG/CAU2/ C50	**758±29 [D-AMS-1230]**	**bone**	AD1270-1374						
				HG/CAU2/ C18	**819±30 [D-AMS-1229]**	**bone**	AD1229-1274						
				GAC/C58	**785±50 [GrA-15193]**	**fibre ceramic**	AD1225-1295						
200	**Buitensfontein 95 [BUI95]** inland surface site Northern Cape	-31,60686111S 24,03563889E	Hunter-gatherer-stock-keepers	surface	**480±60 [Pta-6156]**	**fibre ceramic**	AD1415-1607	**1**	0	0	0	grit-tempered lug and rocker stamp grass-tempered ware [bowls].	0

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	[178, 179]												
221	**Haaskraal** inland rock shelter site Northern Cape **[78, 79, 80]**	-31,55S 24,23333333E	Hunter-gatherers with livestock [Phase 2]	level 8, sq. E8	545±45 [SMU-1636]	charcoal	AD1405-1443	**1**	0	**N2**	Tortoise carapace bowls and cups [Phase 2 up to Phase 5b]	The beginning of decorated grass-tempered ware with some plain grass ware. Few Khoe sherds [Lugged Ware].	sheep [1N], cattle [1N]
				level 8, Sq. E	544±43 [SMU-1636]	charcoal	AD1406-1442						
				level 8, sq. E12	**315±65 [OxA-4395]**	**bos tooth**	AD1500-1667						
				level 8, Sq. E12	**410±65 [OxA-4395]**	**sheep bone**	AD1453-1623						
				level 9, Sq. O8	**300±40 [AMS-61147]**	**bos bone**	AD1511-1667						
222	**Volstruisfontein** large inland rock shelter Northern Cape **[78, 79, 80, 178]**	-31,48333333S 24,11666667E	Hunter-gatherer-stock-keepers	VOL_95_B	**940±100 [Pta-5941]**	**fibre in pottery**	AD1040-1216	**1**	0	0	0	grass-tempered ware [bowls] and grit-tempered lug.	0
225	**Glen Elliot Shelter** rock shelter site Northern Cape **[180]**	-30,77666667S 25,63333333E	Hunter-gatherer-stock-keepers		1120±70 [Pta-3402/75]	charcoal	AD890-1025	**3**	0	**N17**, 4.2-8mm, manufacturing present.	0	Grass-tempered bowls and some grit-tempered pottery	0
229	**Bloeddrift 23 [Auchas]** inland open-air site Northern Cape **[182]**	-28,35083333S 16,80111111E	Pastoralist	Hearth 3B	355±15 [Pta-7942]	charcoal	AD1509-1627	**3**	4 water container frags. [undecorated]	**N153** [total at site], 3.4 and 11.8mm, manufacturing present at site.	0	7 decorated with punctate incision immediately below the rim. 1 small bowl fragment. 3 lugs and 1 'nipple' base. **[609 sherds]**	sheep/goat [4N], goat [1N], donkey [2N], horse [1N]
234	**Wonderwerk**	-28,84583333S 23,55527778E	Pastoralist [Doornfontein]	Layer 2b Thackeray Exc. 1979	1210±50 [Pta-2779]	charcoal	AD777-967	**3**	Decorated ostrich eggshell fragments [nq]	**N35**, manufacturing present at site.	leather [1 piece]	5.6mm thick. All grit tempered and undecorated. **[1 sherd]**	sheep/goat [1N]

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	large inland cave site Northern Cape **[86]**												
242	**De Hangen** cave site Western Cape **[183, 184]**	-32,08333333S 18,86666667E	Hunter-gatherer	CARI/6	485±45 [Pta-168]	charcoal	AD1420-1478	**2**	Ostrich eggshell flask mouth pieces. 1 piece decorated: crisscross incised.	**N267**, mean 5.7mm [range 3.5mm to 11.0mm], smaller beads appear to be coated in red ochre. Minimal evidence for bead manufacture.	Modified tortoise carapace bowls and scoops, fibre twine and string and leather. Fibrous twine may have formed the handle of a lugged pot [Parkington and Poggenpoel 1971: 18]	4 lugs, 1 base. Average thickness: 6 to 5mm. Clay mixed with sand and/or shale grit. All sherds have red burnish (ochre). 45 decorated pieces: dots or lines and occasionally both. Cape Coastal Midden Pottery. **[330 sherds]**	sheep/goat [1N] [?], cattle [1N]
				CARI/3	380±45 [Pta-125]	charcoal	AD1483-1625						
247	**Grootrif G [GFG]** coastal shell midden/mound Western Cape **[37]**	-32,16666667S 18,31222222E	Hunter-gatherer	Layer 1 [Patella Capping]	690±40 [Pta-4070]	charcoal	AD1296-1322	**3**	0	**N3**, 4.5 and 5.6mm. Minimal evidence for manufacturing.	Fragment of a tortoise carapace bowl rim.	Mostly black, grey-brown, red-brown or dark-brown. Maximum wall thickness: 4.4 to 9.8mm. Quartz temper medium to coarse grained. 1 decorated consisting of two parallel grooved lines **43 sherds]**	sheep [3N] [?]
248	**Dunefield Midden 1 [DFM1]** open air coastal midden[s] campsite Western Cape **[185, 186, 187, 188, 189]**	-32,30136111S 18,34833333E	Mixed hunter-gatherer/Pastoralist	KIR072	600±40 [Pta-5277]	charcoal	AD1325-1421	**2**	numerous ostrich eggshell flasks present	**N408**, only 3 unfinished beads. No manufacture on site.	Tortoise carapace used as possible bowls.	4 nearly complete vessels are lugged, narrow-necked, and have conical or sub-conical bases. Substantial charring on most of the pottery recovered from the middens with some showing carboneous material adhering to the outer surfaces indicate that the vessels were used for cooking. **[1011 sherds]**	sheep [41N]
				ELA010	620±50 [Pta-5276]	charcoal	AD1317-1416						
				KIR050	640±40 [Pta-5062]	charcoal	AD1316-1403						
				PET027	650±50 [Pta5280]	charcoal	AD1309-1400						
				ELA043	680±50 [Pta-4082]	charcoal	AD1298-1390						
				KIR026	710±45 [Pta-4799]	charcoal	AD1285-1386]						
				FRA052	1130±40 [Pta-5070]	marine shell	AD1309-1441						
				ELA086	1140±40 [Pta-5011]	marine shell	AD1304-1436						
				FRA030	580±50 [Pta-5061]	charcoal	AD1327-1439						

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				SHA033	510±40 [Pta-4807]	charcoal	AD1419-1453						
				FRA026	1240±40 [Pta-5031]	marine shell	AD1222-1391						
				SHA062	1350±70 [Pta-4801]	marine shell	AD1084-1288						
249	**Connies Limpet Bar (CLB)** small coastal shell midden Western Cape **[190]**	-32,31666667S 18,33333333E	Hunter-gatherer	Spit 1, sq. C6	390±40 [Pta-4020]	charcoal	AD1463-1623	**2**	cache of 5 flasks	0	0	Undiagnostic [**10 sherds]**	0
256	**Kreeftebaai [KTB]** dense concentration of shell Western Cape **[92]**	-33,13444444S 17,98472222E	unspecified LSA group	DBHLWCS, sq. E6	970±50 [Pta-5517]	charcoal	AD1043-1158	**3**	0	**N3**, 4.7 - 7.4mm, no manufacturing present at site.	0	Undecorated pottery. Mean sherd thickness 6mm. One of the sherds had a drilled hole possibly used for suspension. **[178 sherds]**	cattle [2N]
257	**Tortoise Cave** small coastal rock shelter Western Cape **[40, 139]**	-32,32694444S 18,36027778E	unspecified LSA group	Layer 1a	760±50 [Pta-3600]	restoid seeds	AD1233-1379	**2**	0	**N35**, 0 unfinished beads, manufacturing absent.	twine/cordage [two strands twisted]. Some of the twine is knotted and includes part of a rolled up woven mat [±110mm long]. A wad of grass tightly bound together with thinner pieces of twine to form a curved cylinder, perhaps part of a handle. A single piece of leather.	Great majority of pieces are black in colour. Thickness varies: 5.5 to 12.5 mm. Coarse admixture of quartz to clay. None are decorated **[6 sherds]**	sheep [14N]
267	**Diepkloof Rock Shelter** large coastal rock shelter	-32,39139722S 18,457625E	Hunter-gatherer	Grass Unit [Grass Bedding]	1050±85 [GaK-4597]	charcoal	AD976-1152	**2**	0	**N 127** [total at site], manufacturing present.	Total for Grass Unit: leather; string or fibre knots.	Cape Coastal Ware.	sheep [65N total at site]
				Grass Unit [small	900±50 [Pta-1056]	charcoal	AD1071-1261						

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	Western Cape **[140]**			hearth in bedding area]									
				Grass Unit [rear of Cave]	390±30 [Pta-1055]	charcoal	AD1464-1622						
268	**Renbaan Cave** rock shelter Western Cape **[89]**	-32,23333333S 18,86666667E	Hunter-gatherer	Bedding Units (BU)	1150±50 [Pta-3768]	charcoal	AD1295-1436	**3**	0	**N35**, 1 unfinished bead, minimal evidence for manufacturing on site.	Modified tortoise carapace bowl, string, leather. Some thick, twisted fibre.	In total at site there are 9 undecorated potsherds, mostly blackened with a sand-grit temper. Similar to Cape Coastal Pottery. Some sherds contain sooty encrustations on the inner and outer surfaces. **[9 sherds]**	0
270	**Paternoster** coastal shell midden Western Cape **[193]**	-32,8S 17,88333333E	unspecified LSA group	Layer 1	870±50 [Pta-1616]	charcoal	AD1181-1266	**2**	0	0	0	Pottery consists of undecorated body sherds. Sherds are blackish in colour between 5 and 8mm thick, contain large amounts of quartz temper. They conform to the pottery type found throughout the south-western Cape (Rudner 1968) [24 sherds]	0
274	**Blombosfontein 9 [BBF9]** small rock shelter Western Cape **[44]**	-34,41469722S 21,22003611E	unspecified LSA group	Unit OH, sq. A2	480±45 [Pta-6187]	charcoal	AD1422-1483	**3**	0	**N1**, manufacturing not present at site.	0	5 burnished with 3 burnished with ochre. Mean thickness is 5.4mm. Possible pointed base. **[10 sherds]**	0
					940±50 [Pta-6248]	shell	AD1451-1626						
280	**Simon se Klip [SSK]** stone walling site hill top Western Cape **[143]**	-32,16166667S 18,33333333E	Pastoralist [single occupation AD820]	sq. F9	1440±60 [GX-32343]	marine shell	AD632-756	**3**	0	0	0	Typically, thin-walled, some red burnished. One rim sherd is from a small pot. Another may possibly be part of a spout rim. The pottery assemblage may form part of the early ceramic assemblages from the Western Cape, Spouted Incised Ware **[12 sherds]**	0
				sq. F5	1310±60 [GX-32342]	marine shell	AD731-881						
				sq. F2	1210±60 [GX-32241]	marine shell	AD849-1001						
281	**Witklip [WK]** small coastal rock shelter Western Cape	-32,91694444S 17,98361111E	Hunter-gatherer	Unit 1 [Orange Loam, sq. I1]	500±50 [Pta-5469]	charcoal	AD1409-1463	**2**	water bottle found in FBS, sq. F1	**N5**, 6.1±2.1mm, bead manufacture not reported for site.	0	Ceramics conform to the Kasteelberg ceramic sequence. **[1 sherd]**	0

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	[92]												
282	**Drie Susters Main [DSM]** dense concentrated shell midden Western Cape **[92]**	-33,10083333S 18,00055556E	Pastoralist	Bottom of sq. C6	1050±60 [Pta-5478]	charcoal	AD988-1145	**3**	0	**N7**, 4.2 - 7.5mm, manufacturing absent at site.	0	Pottery is characteristic of the upper half of the Kasteelberg B sequence. Mean sherd thickness is 6.06mm [Lugged Incised Ware] **[279 sherds]**	0
284	**Voelvlei** inland large boulder site Western Cape **[92]**	-33,4S 19,06694444E	unspecified	Middle Unit [Charcoal layer]	420±40 [Pta-5527]	charcoal	AD1452-1618	**3**	several container fragments.	**N81**, 4.7 - 11mm, manufacturing not reported for site.	0	1 sherd similar to De Hangen style and another similar to Kasteelberg during the later sequence. Fragment of pierced lug. Average thickness is 5.7mm**. [280 sherds]**	0
				Top Unit [Loose Grey]	373±21 [Pta-5547]	charcoal	AD1498-1625						
286	**Kasteelberg A [KBA]** open air boulder site located on hilltop Western Cape **[93]**	-32,79575278S 17,96759444E	Pastoralist	20c: 25cm	970±50 [Pta-4336]	charcoal	AD1043-1158	**2**	0	**nq**, not manufacturing present at site.	0	11 lugged vessels associated with the top 30cm	sheep [268N], cattle [6N] [total at site]
287	**Kasteelberg B [KBB]** open air site [base of hill] Western Cape **[93]**	-32,79575278S 17,96759444E	Pastoralist	B4:30 - 34cm	920±40 [Pta-3742]	charcoal	AD1054-1218	**2**	0	**N6110**, 6.6±1.1mm, manufacturing present at site.	0	LUND, mostly lugged vessels. Rim decoration disappears and only plain rims are found.	sheep [138M], cattle [7M] [total at site]
				A2:45-50cm	880±5 [Pta-3747]	charcoal	AD1160-1264						
				C2:91cm	910±50 [Pta-3787]	charcoal	AD1051-1227						
				F4:H4	990±35 [Pta-4500]	charcoal	AD1036-1147						
291	**Heuningklip**	-32,87833333S 18,01166667E	Pastoralist	Light Shelly Scatter [LSS]	760±50 [Pta-4167]	charcoal	AD1233-1379	**3**	0	**N69,** manufacturing present at site.	0	Diagnostic sherds include decorations and lip forms found in both lower and middle units at KBB. Lugged Pottery. **[885 sherds]**	sheep/goat [20M]

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	coastal open-air granite hill shell midden Western Cape **[93]**												
297	**Duiker Eiland** shell midden Western Cape **[151]**	-32,71666667S 17,91666667E	Hunter-gatherer	layer 1	1700±50 [Pta-1581]	marine shell	AD730-944	**3**	0	x	0	Pottery present mostly near the surface. 1 spout fragment present**. [4 sherds]**	0
299	**Faraoskop Rock Shelter** inland rock shelter Western Cape **[99]**	-32,12527778S 18,61444444E	Hunter-gatherer	layer 1 [Unit GAS]	670±50 [Pta-4811]	charcoal	AD1302-1392	**3**	0	**N39**, manufacturing present at site.	*Cyperus textilis* [matting], fibrous twine [some thick triple-stranded], fragments of knotted fibres. 3 pieces of leather, leather bundle bound with string, sewn leather.	Adiagnostic **[1 sherd]**	0
302a	**Elands Bay Cave** coastal cave site Western Cape **[47, 153, 154]**	-32,31001944S 18,35200278E	Hunters-with-sheep/Pastoralist/Strandloper	ALMJ	1120±85 [GaK-4335]	charcoal	AD876-1127	**2**	0	**nq**, beads show an increase to greater than 5mm.	-	Pottery present	Total for units 1 -22: Sheep [13N/3M]
				EDDI	1040±50	-	AD995-1137		undecorated ostrich eggshell flask mouth with adhesive (the sealant suggests that fat was used as an additive in order to modify the adhesive properties.]				
				MRSB, sq. Y7	500±45 [Pta-5813]	charcoal	AD1414-1459						
				Nkom, sq. A8	320±50 pPta-1815]	charcoal	AD1505-1655		0				

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305	**HavensCave** inland cave site and human burial Eastern Cape **[54, 156]**	-33,68333333S 24,56666667E		infant (foetal?) burial	between 1280±50 [Pta-4610] and 190±80	charcoal	between AD691 and AD1891	**3**	0	**N18** (associated with burial)	tortoise carapace (*Homopus areolatus*)	0	0
313	**Melkhoutboom Cave** cave site Eastern Cape **[51]**	-33,31666667S 25,28333333E	Hunter-gatherer	Overlie of the Main Bedding Unit [OMB]	undated			**2**	0	**N7**, incomplete beads	Knotted bunches of the leaves of bulbar plants and parts of string leather bag; netting; cordage [cyperus textilis]; matting	Necked pots and bowls. Decoration is simple incision or dotting. Both grit and grass temper predominated. Occurrence of an internally reinforced lug.	0
				Surface Unit [SSD]	250±70 [Gak-1537]	charcoal	AD1515-1938						
315	**Scotts Cave** rock shelter Eastern Cape **[51]**	-33,73333333S 25,71666667E	Possible pastoralist stock- post	-	760±100 (SR-82)	charcoal	AD1218-1389	**2**	0	0	leather; knots possibly related to netting [possibly extends back as far a 5000 BP]	Cape Coastal pottery	sheep
				Sq. J4 top 3 inches	360±80 [Y-1425]	charcoal	AD1478-1627						
316	**Nelson Bay Cave** large coastal cave site Western Cape **[52, 53]**	-34,10277778S 23,375E	Herders	Unit 24	650±50 [Pta-3362]	charcoal	AD1309-1400	**2**	0	**N145** [Unit 22, 23 and 24], minimal evidence for manufacturing.	tortoise carapace bowls are confined to the deposits above Unit 60.	Pottery present with one possible spout fragment.	sheep [13N] [Units 22-29]
				Unit 23	850±50 [Pta-3361]	charcoal	AD1200-1274						
				Unit 22 [a]	455±30 [Pta-1361]	charcoal	AD1442-1486						
325b	**Anne Shaw Middledrift [MAS]** inland site Eastern Cape **[194]**	-32,83333333S 26,98333333E	Pastoralist	North Mound/Ashy Soil Trench B, level 4	920±50 [Pta-838]	charcoal	AD1050-1221	**3**	0	0	0	Pottery is undecorated, broken pot cylinder 15mm diameter. 1 sherd with brown ochre burnish and 1 sherd with red ochre burnish. Distinct from farmer ware, its appearance may be similar to Khoe pottery. Lugs were recovered from other mounds in the vicinity of the North Mouth.	sheep or sheep-sized antelope and probable cattle [?] [identification is not secure].
326	**Oakleigh Farm [QOB]**	-31,80222222S 26,90055556E	Pastoralist	level 4 [30 - 35cm]	1040±50 [Pta-935]	charcoal	AD995-1137	**3**	0	**nq**, manufacturing not reported for site.	Leather [level 3]	Pottery occurs from surface down to level 4 in an undisturbed sequence.	sheep/goat [25N],

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	inland rock shelter Eastern Cape **[194]**			level 4 [15 - 20cm]	360±50 [Pta-801]	charcoal	AD1500-1632					Some sherds black in colour with a medium thickness. Brown ochre burnish on a small number of sherds. Carbon coating on sherds is common. Some dark grit temper Dominated by comb stamping decoration. A tapered bowl [plain] was also identified. The pottery is similar to Class A ceramics recorded by Sampson in the Seacow River Valley.	cattle [1N] [associated with the more recent date].
328	**Welgeluk** inland rock shelter Eastern Cape **[103]**	-32,91263889S 26,42444444E	Hunter-gatherer contact with farmers	-	510±50 [Pta-3934]	charcoal	AD1410-1457	**3**	0	**nq**, not reported in its entirety	0	Farmer ware present.	0
331	**Khartoum 1** Type R open air stone walling settlement Free State **[25]**	-29,26666667S 24,75E	Hunter-gatherer-stock-keepers	15cm depth Ex. 1-3 in structure L	570±60 [Pta-3093]	charcoal	AD1327-1445	**3**	0	0	0	Sherds in red sand, LSA and stone pipe. Pots and bowls are undecorated, have a mean wall thickness of 10-13mm, and sometimes include small amounts of grass-temper **[19 sherds]**	0
334	**Rose Cottage Cave** inland rock shelter Free State **[195, 196]**	-29,21666667S 27,46666667E	Hunter-gatherer contact with pastoralists and farmers.	Layer A ceramic bearing	680±50 [Pta-5622]	charcoal	AD1298-1390	**1**	1 'water bottle' fragment and 3 engraved pieces.	**N34**, manufacturing present	0	Level A contains a possible grit spout. Assemblage comprises of three types: 1. Grass Bowls [undecorated], Grit Bowls [possibly belonging to Khoe ceramic tradition] and agro-pastoralist vessels.	0
				-	**610±5 [Pta-350]**	**grass-tempered sherd**	AD1320-1421						
				Layer Mn	**500±50 [Pta-6788]**	**organic material in potsherd**	AD1409-1463		0	**N1**, manufacturing absent			sheep [16N], goat [28N], sheep/goat [19N]
337	**Tandjiesberg Rock Shelter** small inland rock shelter	-28,45S 27,16666667E	Hunter-gatherer contact with pastoralists	Level GH [300mm depth]	860±60 [Wits-2004]	charcoal	AD1179-1273	**2**	0	0	0	2 possible bowls, 2 diagnostic 'Smithfield' grass-tempered sherds and undecorated grass-tempered sherds. 1 ochre burnished body sherd. 3 small fragments of what may be unpierced	0

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	Free State **[197]**											grit-tempered lugs or bosses. Mean thickness of grass tempered sherds: 7mm and mean thickness of grit tempered sherds: 6.8mm **[25 sherds]**	
339	**Rooikrans Rock Shelter** inland rock shelter Free State **[197]**	-29,43139167S 27,30158611E	Hunter-gatherer contact with pastoralists and farmers.	Level 3, sq. DS2	**415±65 [OxA-3386]**	**charcoal**	AD1450-1623	**3**	0	**N2** [total for site], 4,6mm, manufacturing not reported for site.	0	Jars, constricted pots, open and slightly constricted bowls. Largely undecorated and tempered with quartz grit. Sometimes pottery grog is used. 8.7mm thickness. 6.6% of assemblage is burnished in red/ochre. Type V and Caldedon Valley sites. 1 Sotho sherd (found in disturbed context]. No grass tempered sherds were recovered [511 sherds total at site]	sheep/goat [1M]
345	**Gehle Shelter** medium sized inland rock shelter KwaZulu-Natal **[161]**	-29,12972222S 29,57277778E	Hunter-gatherer	Layer 1 (MO1 top)	750±50 [Pta-3243]	charcoal	AD1267-1383	**2**	0	0	0	undiagnostic **[12 sherds total layer 1]**	0
346	**Mbabane Shelter** inland rock shelter KwaZulu-Natal **[162]**	-28,75555556S 30,37416667E	Hunter-gatherer contact with farmers	Layer 3 (GBS)	500±50 [Pta-3684]	charcoal	AD1409-1463	**2**	0	**N1**, majority being 4 -5 mm, no manufacturing present on site.	A piece of string emerging from gourd was recovered from layer 2.	A small bag-shaped pot **[77 sherds]**	0
				Layer 3 (GBS)	470±40 [Pta-3848]	charcoal	AD1430-1487						
348	**Mgede Shelter** inland rock shelter KwaZulu-Natal **[198]**	-28,17S 29,68722222E	Hunter-gatherer contact with farmers	Layer 2 (CBS1)	820±50 [Pta-3664]	charcoal	AD1219-1280	**2**	1 piece of decorated ostrich egg shell, showing two sets of parallel lines with diagonal criss-cross lines within each set.	**N14** [5 ochre stained beads], 3-6mm, no manufacturing present on site.	0	Possibly 3 bag-shaped pots and 1 bowl. Associated. **[63 sherds]**	sheep/goat [level 1] and possible cattle [?]
351	**Mhlwazini Cave** inland rock shelter KwaZulu-Natal **[59, 199]**	-29,04777778S 29,38972222E	Hunter-gatherer contact with farmers	Layer 4 (WMAC)	850±50 [Pta-4864]	charcoal	AD1200-1274	**2**	0	**N25**, 5.17±1.25mm, manufacturing not present on site.	gourd; knotted grass; string, 2 pieces of leather. Possible remains of a tortoise carapace container	Later farming ware **[74 sherds]**	0
				Layer 3 (BSL2)	320±40 [Pta-4850]	charcoal	AD1510-1651						

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4.4.4. Map 4: cal AD 912 – 1512

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352	**Collingham Shelter** inland rock shelter KwaZulu- Natal **[106]**	-29,45972222S 29,79583333E	Hunter-gatherer	TBS (uppermost deposit)	650±50 [Pta-5092]	wood	AD1309-1400	**2**	0	0	Leather bag, gourd, string	Pottery from TBS appears to be thicker than the underlaying units. Mean thickness: 7.94±2.53mm for 9 sherds.	0
355	**Mzinyashana 1** inland rock shelter KwaZulu-Natal **[60, 164]**	-28,31416667S 30,47222222E	Hunter-gatherer and Farmer occupations	Layer 3	970±50 [Pta-6538]	charcoal	AD1043-1158	**2**	0	0	0	Mean thickness of sherds generally match those of Farming community ware from the second millennium AD [Moor Park and Blackburn] [**629 sherds levels 1-3].**	sheep/goat [4N], cattle [3N]
				Layer 2	790±50 [Pta-6541]	charcoal	AD1225-1291						
				Layer 1	660±50 [Pta-6715]	charcoal	AD1306-1395						
356	**iNkolimahashi Shelter** inland rock shelter KwaZulu-Natal **[107, 165]**	-28,79416667S 30,18055556E	Hunter-gatherer contact with farmers	Layer 3	550±45 [Pta-7459]	charcoal	AD1404-1441	**2**	0	**N5**, bead manufacturing not reported for site.	0	U-shaped pot and a bag-shaped pot. Sherds similar to pottery from farmer sites of the second millennium AD. **[34 sherds]**	sheep [1M]
369	**Goergap 113 [KR}** inland rock shelter Limpopo **[200]**	-24,11388889S 28,47083333E	Hunter-gatherer contact with farmers	Layer 3	720±50 [Pta-5507]	charcoal	AD1280-1386	**2**	0	**N491** [Layers 1-3], 1.5 to 6.0mm, manufacturing present on site.	0	Presence of relatively large numbers of undecorated pottery in uppermost levels [73% of the total pottery assemblage] may reflect a more recent Sotho-Tswana or Northern Ndebele occupation of the area.	cattle [2N], sheep/goat [6N]
				Layer 3	600±50 [Pta-5213]	charcoal	AD1321-1428						
				Layer 2	540±50 [Pta-5510]	charcoal	AD1405-1446						
				Layer 1	380±50 [Pta-5511]	charcoal	AD1482-1626						
383	**Pitsaneng** small inland rock shelter Lesotho	-29,72777778S 28,79277778E	Hunter-gatherer-livestock-keepers and contact with farmers	Spit 7 (Sq. Q2)	**960±90 [OxL-1314]**	**OSL date/pottery**	AD1032-1200	**1**	0	**N34**, manufacturing not present at site.		Farmer ware present. **[65 sherds]**	cattle [69N]
				Spit 18 (sq. M4)	**870±80 (OxL-1316)**	**OSL date/pottery**	AD1070-1280						

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	[201]			Spit 9 (sq.M4)	840±40 (Pta-8491)	charcoal	AD1217-1271						
				Burial (M2)	810±50 (Pta-8360)	charcoal	AD1221-1283						
390	**Muela Rock Shelter** inland rock shelter Lesotho **[64]**	-28,76666667S 28,46305556E	Hunter-gatherer	Layer 4	730±50 [Pta-6329]	charcoal	AD1276-1385	**3**	0	**N3**, minimal evidence for manufacturing at site.	0	A sherd was recovered in layer 4 of thicker-walled type. [1 sherd perhaps intrusive].	0
75	**Amis 6** rock shelter Namibia **[16]**	-21,11928333S 14,47323611E	unspecified LSA group	date is *terminus ante quem*	520±50 [KN-2687]	charcoal	AD1409-1453	**F**	0		twisted and knotted vegetable fibres		
111	**Indunda Cave** inland rock shelter Zimbabwe **[175]**	-20,54520833S 32,088575E	Hunter-gatherers in contact with farmers or farmer and hunter-gatherer occupations	Level 4 top [ED]	880±70 [Pta-7748]	-	AD1150-1274	**F**	0	ED top: **N114** [quantity is taken from ED1-3], manufacturing present at site.	0	Sherds were adiagnostic and mostly body sherds that were undecorated [**14 sherds]**	0
113	**Mtanye Stream** inland rock shelter Zimbabwe **[82]**	-21,38194444S 29,25416667E	Hunter-gatherer in contact with farmers.	Level C bottom [30-40cm]	560±40 [Pta-968]	charcoal	AD1401-1437	**F**	0			LSA mixed with pottery	0
				Level C [25-30cm]	480±40 [Pta-967]	charcoal	AD1426-1479						
121	**Penguin Midden or LK2004-011** open-air coastal shell midden Northern Cape **[21]**	-30,36947222S 17,30047222E		Midden 3 lowest layer	1080±50 [GX-32059]	marine shell	AD1324-1474	**F**	21 undecorated mouth fragments.	**N3**, 5.4mm, manufacturing absent.	0	0	0
				Midden 1 topmost layer	1200±60 [GX-32057]	marine shell	AD1252-1420						

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134	**KN2005/135B** small deflated coastal scatter Northern Cape **[22]**	-30,09166667S 17,248E	Hunter-gatherer [Group 1]	D30 surface	**368±23 [OxA-22931]**	**bone**	AD1500-1626	**F**	2 fragments of undecorated mouth fragments.	**N18**, 8.50±1.50mm, manufacturing not reported for site.	0	0	0
137	**LK2004/011B** coastal midden Northern Cape **[22]**	-30,36969444S 17,30038889E	unspecified LSA groups [Group 3]	slumped material	**924±22 [OxA-22980]**	**charcoal**	AD1155-1202	**F**	2 undecorated mouth fragments.	**N16**,6.08±1.03mm, manufacturing not reported at site.	0	Only **1 plain body sherd** recovered from slumped material.	0
160	**VR048** dense open-air scatter site Western Cape **[176]**	-31,52888889S 18,58555556E	unconfirmed [hunters or pastoralists]	surface	520±50 [IT-C-678]	charcoal	AD1409-1453	**F**	5 possible engraved fragments [2 more convincing] [incised lines], 2 undecorated mouth openings.	**N7**, 3.11 - 8.23mm, manufacturing present at site.	0	All sherds have quartz temper but 5 sherds have 'botanical' temper. Wall thickness varies between 3.9 and 10.4mm with a mean of 5.97±1.37mm. 2 broken lugs present and 1 complete. Red slip occurred on the surface of 108 sherds. 8 sherds are decorated with broad-incision **[266 sherds]**	0
161	**Jakkalsberg K (JKBK)** deflated open-air site Northern Cape **[22]**	-28,18225S 16,88219444E	unspecified LSA groups	K60	**358±26 [OxA-24528]**	**bone**	AD1506-1627	**F**	2 flask mouth fragments	**N14**, 6.16±1.38mm, manufacturing not present on site [1 fragment]	0	Large pottery assemblage. 24 rim sherds found and all plain. 2 lugs, 1 base of spout? 1 sherd with red slip. All sherds had mineral temper, a few may have included some organic temper. Average wall thickness 5.22±0.94mm. Although difficult to tell, there may be up to 9 individual pots. **[798 sherds]**	sheep [2N] [?] [identification is not secure.]
227	**Aspoort Cave** inland cave site Northern Cape **[181]**	-32,5S 19,51888889E	Hunter-gatherer and pastoralist	Loose Silty Matrix [beneath dung crust]	690±30 [Pta-2182]	charcoal	AD1298-1386	**F**	0	0 [burnt ostrich eggshell fragments recovered]	0	Pottery is similar to that found throughout the coastal mountain areas of the Western Cape. Thin-walled, undecorated, grit-tempered with slightly rolled rims.	0
228	**Springbokoog [SBO]**	-30,22770556S 21,53725556E	Hunter-gatherer [Swartkop]	SBO7/surface	670±50 [Pta-4203]	oes	AD1302-1392	**F**	decorated fragments [nq]	0, not reported in its entirety.	0	not reported in its entirety.	0

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	5 surface scatters Northern Cape **[34]**			SBO10/excavated surface	620±50 [Pta-4202]	oes	AD1317-1416						
				SBO2/excavated surface	580±50 [Pta-4099]	oes	AD1327-1439						
				SBO6/surface	590±50 [Pta-4201]	oes	AD1325-1431						
				SBO 11/surface	410±45 [Pta-4794]	oes	AD1454-1622						
250	**Borrow Pit Midden (BPM)** coastal open shell midden Western Cape **[191]**	-32,51666667S 18,51666667E	Hunter-gatherer	Main Horizon (MH)	640±50 [Pta-4023]	charcoal	AD1311-1405	**F**	0	0	0	Two refitted undecorated sherds with red-to-brown surface. Temper is fine to medium grained with inclusions of quartz and possibly also ground shell **[2 sherds]**	0
251	**Hailstone Midden [HSM]** coastal shell midden Western Cape **[192]**	-32,34639444S 18,36596944E	Hunter-gatherer	Layer 4 [GBS/PS]	990±60 [Pta-4018]	charcoal	AD1031-1151	**F**	1/2 undecorated container	**N3**, 5.2 and 9.4mm, manufacturing not reported for site.	0	Undecorated pottery fragments. Average thickness: 6.5mm, mostly grit-tempered. Of the total of 160 sherds, 13 had ochre burnish. Overall, not unlike the fragments from other western Cape sites (Rudner 1968) **[24 sherds]**	0
					910±40 [Pta-4626]	charcoal	AD1073-1223						
283	**Vlaeberg** open-air site Western Cape **[92]**	-33,10138889S 18,00111111E		V1-1	520±45 [Pta-5473]	charcoal	AD1414-1450	**F**	0	**N1**, 5.4mm, no manufacturing present on site.	0	Similar to De Hangen style. Mean sherd thickness is 6mm [68 sherds]. A rim sherd that appears to be part of a spout.	0
				V1-3	520±45 [Pta-5520]	charcoal	AD1414-1450						
333	**Voigtspost O** saltpan site in shallow depression Free State **[157]**	-29,12833056S 27,37135556E	unspecified LSA groups	Layer 5	1220±50 [Pta-1483]	oes	AD774-961	**F**	0	0	0	Small undecorated black body sherds with smooth matt inner and outer surfaces with grit and grass temper. **[2 sherds from slope wash]**	0

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388	**Bolahla** small inland rock shelter Lesotho **[202]**	-30,06666667S 28,4E	Hunter-gatherer [with possible farmer contact]	200 - 300mm depth	910±80 [Pta-5549]	charcoal	AD1047-1264	**F**	0	**N18**, 0 ostrich eggshell fragments indicate that manufacturing did not take place at the site.	0	Bag-shaped with fairly straight necks. Undecorated. Some of the sherds indicate Basotho manufacture [agro-pastoralist pottery] whilst the date suggests that it may derive from LSA pottery with non-Sotho origins.	cattle [2N], sheep c.f. [2N], sheep/goat [14N], goat c.f. [1N] [total at site].
389	**Tloutle** large inland rock shelter Lesotho **[203, 204, 205]**	-29,46666667S 27,76666667E	Hunter-gatherer contact with farmers	Upper deposit UD3	715±65 [OxA-4069]	bone point	AD1279-1389	**F**	0	0	0	Pottery of local Basotho type [ago-pastoralist]	cattle [98N], goat [1N], sheep/goat [12N] [total for site]
394	**Moshebi's Shelter** inland rock shelter Lesotho **[166, 206]**	-29,93333333S 29,03333333E	Hunter-gatherer	Spit 1	940±25 [UGAMS11591]	charcoal	AD1051-1190	**F**	0	0	0	Pottery present.	0
398	**Siphiso Shelter** small inland rock shelter Eswatini **[122]**	-26,31388889S 31,975E	Hunter-gatherer	Stratum II	350±60 [TX-5622]	charcoal	AD1500-1641	**F**	0	**N52** [Strata I-V], 5.59±0.856mm, manufacturing not reported for site.	0	0	0

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4.4.5. References

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4.4.5. References

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Account Reference Number	*1.Name of Identifier 2.Type of documentation 3. Date of account 4. Source*	*Group and subsistence economy if provided in text*	*Region and country Area where selected co-ordinates are taken are presented in brackets.*	*Co-ordinates*	*Material Identification and species identification if provided in text*	*Container function*	*Verbatim record*
1	Kolb traveller account 1704-1713 **[1]**	Sonquas	Cape of Good Hope Western Cape, South Africa (Cape of Good Hope)	-33,98935S 18,4318472E	leather	honey stored in sacks	-
2	Wikar traveller account 1770 **[2, 3]**	Bushmen	Namies, Namaqualand Northern Cape, South Africa (Namies)	-29,2757611S 19,2729778E	clay	beer	we came unexpectedly upon a small Bushman kraal of three huts; the children fled into the mountain, but the adults were making merry around a beer pot". [Bollong et al. 1996: 278]
3	R.J. Gordon traveller account 1779 **[2]**	Bushmen	Karoo Northern Cape, South Africa (Karoo central location point)	-31,1806861S 23,6106278E	clay	pots for cooking	‘‘They bake pots of sticky clay, in which they cook’’ [Bollong et al. 1996: 278]
4	H. Lichtenstein traveller account 1803 **[2]**	Bushmen	lower Seacow River Valley. Northern Cape, South Africa	-30,0798583S 24,77245E	clay	-	"a sort of earthen pot …rough and clumsily formed’’ [Bollong et al. 1996: 279]

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			(Lower Seacow River Valley)				
5	Burchell traveller account [drawing] 1812 **[2]**	Bushmen Hunting and gathering	Orange River, Griqualand West Northern Cape, South Africa (Griekvastrad)	-28,18625S 20,7119694	clay	bowl	Drawing of a flat bottom bowl.
6	James Chapman traveller account 1862 **[4]**	Bushman kraal in the Kalahari	Lake Ngami northern Botswana (Lake Ngami)	-20,5152S 22,7898056E	gourd	water container	A calabash of water, a few tortoise shells for dishes and the hulls of innumerable bitter melons lay scattered about together with a few bones [Sydow 1967: 23 -
7	Bleek Linguistic 1878	/Xam [//Kábo]	Bushmanland Northern Cape, South Africa (Bushmanland)	-29,6454083S 19,4773111E	clay	cooking pots	Bleek (Bleek & Lloyd 1911: 343-7) in 1878 interviewed a /Xam Bushman from Bushmanland who described how his wife made cooking-pots. He said that pounded grass was mixed with the clay, but he did not describe the shape or decoration of the pots, saying only that they were small and beautiful [Rudner 1979: 9]

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	[2, 3]						
8	H. Schinz traveller account 1885 **[4]**	Kalahari Bushmen	Nyae Nyae, Dobe Area [exact location not reported] Namibian-Botswana Border (near Nyae-Nyae Pans)	-19,7241583S 20,4679111E	ostrich eggshell container	water carrying and storage	The only vessels which I could see amongst their modest household effects were hollow ostrich eggs in which they keep water and usually carry with them on their wanderings…" [Sydow 1967:24] -
9a	Hans Kaufmann Colonial reconnaissance August 1908	ǂAuin	Rietfontein, Ganab, Gam, Sidonitzaub, Otjamangombe, Tjumda, Epukiro, Oas, Stampriet, Rooigrauwater and Habakobis.	-20,2728611S 20,8075694E	leather sacks ostrich eggshell gourd	storage veld food storage of water	"Gathered plant food is placed in bags made of duiker or steenbok leather which are kept in huts. The Auin will also place small stores of provisions in the veld, by burying sacks of veld food in the ground, …" [Guenther 2005: 69] "…, as well as tsamma, ostrich eggshells filled with water" used for burying in the ground." [Guenther 2005: 69]
9b				-21,96985S 20,1081361E			

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9c	**[5]**		Namibian-Botswana Border	-21,7692639S 19,1014361E			
10	Oberleutnant Trenk Colonial reconnaissance 1910 **[5]**	Namib Bushman [speak Nama]	District Maltahöhe Namib, Nambia (District Maltahöhe)	-24,9358889S 16,9949528E	ostrich eggshell leather sacks	storage of water	"In the waterless regions of the Namib the Bushmen, went out hunting, place cache supplies of water (in ostrich eggshells or gemsbok stomachs) and meat." [Guenther 2005:224] -
11	Hauptmann Muller Colonial reconnaissance 1911 **[5]**	ǂAuin	Kaukau Veld Namibia (Nyae Nyae Pans)	-19,7696611S 20,4642639E	wood	traded wooden vessels	"What was strikingly abundant were the wooden vessels found in each camp. Here one can find mortars, dishes, bowls and pots of different sizes and shapes. Everything was solidly and neatly worked. Small wooden objects, for instance spoons, the Bushmen fashioned themselves. Everything else they derived from the Okavango. This is the source also for all of their iron pieces which they use for the manufacture of weapons and artefacts. For years now a veritable traffic in trade has been established with the Bechuanas from Lake Ngami. [Guenther 2005:211] "I noticed no marked difference in the clothing worn in the north and the south. There were fewer body ornaments among the Kung than among the Auin, I only found a few, inferior specimens of their main items of adornment, the moletsa necklaces, probably because ostriches are rarer up here."

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12	Oswin, R.A. Köhler Photograph [Oswin Köhler Archive, Goethe University] 1911-1996 **[6]**	Kxoé Hunting-fishing-gathering	West Caprivi, Okavango Caprivi (West Caprivi)	-18,1018361S 21,7358806E	Gourd wood and fibre [grass]	gourd in leather bag taken on hunting trip and for carrying water bowls for containing Manketti seeds.	Photograph description: 'A Kxoé man on the hunt in West Caprivi.' Photograph description: 'A Kxoé woman opening Manketti seeds, which she collected in West Caprivi.
13	Joachim Helmuth Wilhelm Colonial reconnaissance 1914-1919 **[5]**	!Kung [Ju|'hoansi] Hunting and gathering	Grootfonetin Otjituo Namibia (Grootfontein)	-19,6094111S 18,10925E	ostrich eggshell onion gourd stomach sack net (*Sansvieria cylindricaa*) wooden tube	storage of water carrying water carrying water carrying ostrich eggshells trade receptacle finest ostrich feathers	"The following kitchen utensils are in use: one or two clay pots, which are Ovambo ware, a wooden mortar with pestle, two cracking stones, several stirring spoons, a spatula for roasting food on the ashes, wooden bowls and ostrich eggshells for water containers. Regarding the last I mention two further types of water containers, which the Bushman will use in an emergency. The stomach of a shot antelope...The other container is made of a large onion, the botanical name of which is unfortunately not known to me...Water can be transported in this container for a short distance." [Guenther 2005:111] "Finally, in the Kaukau veld I came across a net made from agave fibres which is used to carry ostrich egg shells" [Guenther 2005: 114]. "A number of men are getting ready to head for an Ovambo village at the shores of the Okavango, under the leadership of one of the elder men, who has often been involved in trade relations with the group's neighbours. The skins are carefully removed from their storage place, the branches of the tallest trees, and rolled together and tied into bundles. The ostrich feathers are arranged by six and tied up in bushels. The best

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							feathers have a wooden tube as protection. The eggshell necklaces have been packed in the gathering bags." [Guenther 2005 137-138]
14	Schapera Publication 1930 **[1]**	trade between Naron and Auen with the Heikum of the OvaKwangari and MaMbukushu further north.	Ghanzi, Kalahari Botswana (Ghanzi)	-21,2095S 22,0085528E	wood	-	In this the Naron and the Auen play the part of intermediaries, obtaining from the tribes further north the objects they desire, and then bartering them again further south as occasion arises. Egg-shell beads and tobacco and standard articles in this trade, in the sense that they can always be bartered and may even be said to have a fixed value. From the Naron the Auen procure skin garments and bags, for the making of which the former are famous, giving them in return wooden pots, dishes, and spoons made by themselves, and metal pots, spear heads, knives, trade beads, etc. which they obtain through the Heikum from the OvaKwangari and MaMbukushu further north. [Schapera 1930 146-7]. [A basket of millet is also described as being traded between the north-western groups and the Bushmen
15	Vernay-Lang Kalahari Expedition The Illustrated London News 30 April 1930 **[7]**	Bushmen	Gam Kalahari, Botswana (Gam)	-20,2728611S 20,8075694E	ostrich eggshell tortoise carapace	water containers scoops for water	"…ostrich eggs are still more important as water-containers. To store water is the women's duty. A hole about 1/2 inch in diameter is cut into one end of the egg. ...Women are seen pouring in the water with the hollow of their hands. Neatly scraped-out carapaces of small land turtles are also used. When filled, the eggs are closed with a tightly rolled stopper of greased grass, which prevents leakage...Designs are cut or scratched into most of these eggs [eggs that are illustrated in photograph]. [The Illustrated London News 1930: 361]

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16	E.J. Dunn traveller account 1931 **[2, 3]**	Bushmen	Stormberg, pottery found in a Bushmen Shelter Eastern Cape, South Africa (Stormberg area)	-31,5115583S 26,2661667E	clay		The pot was evenly and smoothly finished inside and outside in the clay stage, but the woman potter was not satisfied until she had decorated nearly the whole of the outside surface with a characteristic Bushman motif-a pattern produced by means of a small, flat-ended stick with a notch in it. The rows of impressions made in the soft clay were generally run around the edge.' [pp 9-10] 'the Bushman pottery was not properly fired, and as a rule it comprised only small cooking pots, the usual capacity of which was from one pint to about two quarts. These were used for cooking meat and broth, and for making a kind of porridge of ground grass seed.' [Rudner 1979: 10]
17	Anonymous Photograph [Pitt Rivers Museum] 1945-1950 **[8]**	Bushmen	location not provided		ostrich eggshell gourd	water container used to pour water	Photograph description: Man filling ostrich eggshells with water for storage. wearing loin cloth and ankle ornament of perforated stone.
18	P.W. Laidler ceramic classification	Bushman	Barkly West	-28,4876028S 24,5105056E	leather	-	Leather 'pot' of Bushman origin, from Barkly West, leather-plaited neck sewn on to belly.

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	1938 **[9]**						
19	Lorna Marshall Ethnography 1950-1961 **[10]**	!Kung [Ju|'hoansi] Hunting and gathering	Nyae Nyae Region, /Gam Waterhole Namibian-Botswana Border (Gam waterhole)	20,8222083E	clay pots ostrich eggshell stomach sack wood horn bone tortoise shells	clay pots water containers. water containers water carrying bowls containers for poison dishes for mixing bowls/dishes	clay pots [traded by Bantu-language speaking neighbours]. Observed during drought season: "They took ostrich eggshells filled with water and stayed gathering for two or three days, and returned to /Gam when their shells were empty [pp 5]. "Ostrich eggshells are the common water containers of the !Kung. A hole of one half to three-quarters of an inch in diameter is drilled at the tapered end of the shell through which the shell is emptied and filled. The hole is stoppered with grass. The beautiful creamy white shells are excellent containers. They are thick and not easily broken...The only disadvantage is that they are heavy and weigh about a pound...They can contain thirty-six fluid ounces on average and weighed about three pounds when filled. Each family had eight or ten shells [limited to the number they wish to carry]. Surplus shells are broken and used for making the traditional ostrich eggshell beads...We saw a few shells marked with designs. The designs that were scratched on the shells were to make them identifiable to their owners [mainly women own the shells] [Marshall 1976: 77]. "!Kung also use water bags made from the stomachs of animals…Bags are not satisfactory for carrying long distances: the water spills, drips and evaporates. [Marshall 1976:77] "People also use wooden bowls to carry water from the waterhole to the encampment. But the !Kung depend mostly on the excellent ostrich-eggshell containers." [Marshall 1976:77]. Bark is also used as dishes and spoons and is mostly made and used by men. [Marshall 1976: 414].

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20	George Silberbauer Ethnography 1959 to mid-1960s **[11]**	G/wi Hunting and gathering	Central Kalahari Game Reserve Botswana (Xade area)	-22,3628111S 22,9669278E	tortoise shells (*Kinixys sp)* fibre twine (*Sansevieria*) ostrich eggs hide [leather] antelope [special preference for Giraffe] bladder wood (*Albizia and Ochna sp*.) leather	ladles and bowls spring-loaded snare water containers multi-functional water-containers bowl and mortar and bowls for eating and temporary food storage satchels and pouches, carrying bags	"Tortoises are economically important as a source of meat in all except the winter months [when they hibernate] and their shells are extensively used as ladles and bowls." [Silberbauer 1961: 72]. G/wi women use tortoise shell as scent-boxes in with the women carry aromatic roots and herbs [Silberbauer 1961:50]. "Although most snaring is done by men hunting steenbok and duiker, adolescent boys and girls also set up traps for small mammals and gallinaceous birds. All use the same type of spring-loaded noose made of *Sanseviera* twine." [Silberbauer 1961: 215]. "Birds' nests are robbed of eggs during the laying season. Ostrich eggs are particularly valued, not only for their food content [each holds the equivalent of two dozen hen's eggs] but because they make very handy water containers when the wet season arrives some three months later." [Silberbauer 1961: 216] for a similar reference see also page 221]]. " Ostrich eggshells, on the other hand, are bulky and awkward to carry but make somewhat stronger vessels. If the water source is fairly near, only ostrich eggshells will be used, but if the waterhole is far off, the greater probability of the empty springhare" "Skin [kho:sa]/ Antelope hides are made into leather for clothing and a variety of other articles. The dried, uncured hides of large antelope are used for the soles of sandals [but giraffe hide is preferred]. When food is in short supply, uncured hide is roasted and ground into powder and eaten. Giraffe hide is cut into narrow strips and used as items of gift exchange. The strips find a ready market at trading stores, where they are made into stock whips. Furry skins, notably those of jackals and foxes, are cured and made into headgear and karosses. The hides of larger antelope, particularly those of eland are also made into reems [kxodeg//wa], stout thongs that are eventually sold outside the central Kalahari as trek gear. " [pp 217]

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							"The bladders of springhares are cleaned, dried, and used as water-containers in the wet season. Bladders of small antelope are used as containers of lightweight articles. The bladders of larger antelope are thrown away." [Silberbauer 1961: 219 for a similar reference see page 221]] "When a tree is felled and the trunk is used to make a large object, such as a mortar or a bowl' [Silberbauer 1961: 223]. "The G/wi carve bowls [n!adzi] from the dark, fine-grained wood of *Ochna pulchra*…Geometric designs are burned into the outside wall. These bowls are used for eating and for storing food temporarily…Bowl carving is the work of mean, who make them for their wives and as an exchange medium. Each bowl takes one or two days. The close grain and treatment with Ximenia fat prevent the bowls from splitting after drying. [Silberbauer 1961: 229]. "Another important animal product is beadwork [!xamdzi], which is made from sherds of broken ostrich eggshell water containers….They are an important medium of gift exchange within and between bands and even cross ethnic boundaries when exchanged with different Bushman and Bantu peoples, who value them as decoration. An undetermined proportion of G/wi beads come to them from the !Xo, their western neighbours." [Silberbauer 1961: 227]
21	Richard Lee Ethnography 1963 – 1973	!Kung [Ju|'hoansi] hunter-gatherers turned cattle-	Dobe and /Xai/xai, Kalahari Namibian-Botswana Border	-19,5666111S 21,0359111E	Tortoise carapace ostrich eggshell	used as a single serving dish canteen for water water container	"Two traditional serving utensils are still in use: the shell of the large leopard tortoise makes an attractive and durable bowl up to 1 litre in capacity (Figure 5.7g). Meat, mongongo stew, and many other foods may be passed around the fire in this colourful dish" [Lee 1979: 155]. "The ostrich eggshell canteen remains the most widely used water container amongst the nomadic !Kung. Each shell, when emptied, holds

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	[12]	post herders and beer-brewing entrepreneurs	(Dobe)		stomach sack pods leather sinews iron three-legged pot	water containers carrying food stuffs. nets for carrying cooking, stewing or boiling	slightly over 1 litre of water…The eggshells are an attractive white colour and are reasonably durable; if handled with care, an eggshell can be used for several years. Back in the camp a small hole is drilled at one end and the contents emptied, cooked, and eaten. ...The empty shell is rinsed with water and deodorized with aromatic herbs; with the addition of a grass stopper, it is ready for use as a canteen. Although leak-proof, the shell of the ostrich egg "breathes" slightly, and through the evaporation of small quantities it keeps the water deliciously cool, a property not found in metal or glass containers. The eggshells are only occasionally decorated with incised designs; when done, this is for the purpose of beauty rather than identification. Each married woman owns a stock of 5 to 10 eggshell water containers, though not all these are filled on a given trip to the water hole." [Lee 1979: 122]. "One solution to the problem [reference to weight of ostrich eggshell canteens] is the use of antelope stomach sacs as water containers. Empty and shriveled, a stomach sac is almost weightless and occupies very little space, but each can be filled with up to 4 litres of water - the equivalent of four eggshells. The sac too has a disadvantage: It is very fragile and easily ripped if it comes into contact with a stray branch on the trail. For this reason, it is not nearly as popular as the ostrich eggshell." [Lee 1979: 122]. "Large pods of the baobab tree are sometimes made into water containers. They are smaller than the ostrich eggshell, more fragile, and tend to rot through time." [Lee 1979: 123].
22	Mathias Guenther Ethnography	Nharo hunter-gatherers and occasional	Ghanzi District Botswana (Ghanzi)	-21,6231667S 21,7610583E	ostrich eggshell calabash	household items household items multi-functional	"Ostrich eggshells and calabashes round off the kitchen utensils of the Nharo Bushwoman. They usually do not make their own calabash vessels but, once again, obtain these through trade from Bantu-speaking neighbours." [Guenther 1986:15]

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	August 1968 - April 1970 [with brief visits in 1974 and 1983 **[13]**	herders [and farm labourers]			leather kaross or blanket plant fibres tortoise carapace	snares containers [cases] for fragrant herbs	
23	E.J. Dunn Traveller account 1972 [publication] **[2]**	Bushmen Hunting and gathering	south bank of the Orange River Northern Cape, South Africa (near the Orange River mouth)	-28,3148222S 16,9249944E	ostrich eggshell leather horn bone tortoise carapace	water container and dishes pouch for containing water dish dish bowls	Pottery is conspicuously absent from the list of 21 items recorded by Dunn. Alternative containers included ostrich eggshell, springbok pouch [both water containers], section of ox horn [dishes], tortoise carapace [dishes], ostrich sternum [dishes], and portions of ostrich eggshells [dishes] [Bollong et al. 1996: 280]
24	Ikeya Ethnography 1993 **[14]**	G|wi and G||ana Hunter-gatherer goat raisers	Xade Botswana (Xade, Kalahari)	-22,3628111S 22,9669278E	steel	pot for stewing	Watermelons are consumed by the people in Xade in 5 different ways. The most popular way of eating it is watermelon stew. The preparation of this stew is very simple. The fruit is sliced up, placed in a steel pot, and boiled with no water or seasoning. The watermelon melts into a pasty liquid. After the fire dies down, watermelon seeds are crushed with a mortar and added to the stew. These crushed seeds are not only an important source of fat, but also give the stew a good texture. [Ikeya 1996: 90]

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25	John Jourdain Early European Mariner 1617 **[15]**	Khoe pastoralism	Saldanha Road Western Cape, South Africa (Cape of Good Hope)	-33,98935S 18,4318472E	clay	pot used for boiling	"In the tyme of our beeinge in this roade wee could not gett any refreshinge after the first daie, although the people came downe with a greate store of cattle and sheepe and many people armed. The next daie after our arrivall they brought downe above 5000 head of cattle, which made me doubt some plott of treason with aboute 1000 armed men; butt these cattle they would not sell any unlesse wee would goe with our people to Cories house...Butt when wee were come to the toppe of the hill, some four miles from the tents, wee saw in the valley aboute 10 000 head of cattle, and by judment aboute 5000 people. ..."and wereas before they were accustomed to eate raw stinking meate, they are now content to eate the best and boyle itt themselves in pots which they carry with them for that purpose [Raven-Hart 1967: 88.]
26	J.G. Grevenbroek traveller account 1695 **[2]**	Khoe pastoralism	Cape of Good Hope Western Cape, South Africa (Cape of Good Hope)	-33,98935S 18,4318472E	clay	pot manufacturing	A description of Khoe pottery manufacturing [Bollong et al. 1996: 272-73]
27	Kolb traveller account 1704-1713 **[2]**	Khoe pastoralism	Cape of Good Hope Western Cape, South Africa (Cape of Good Hope)	-33,98935S 18,4318472E	clay	-	"…they do not make pots for sale, but everyone is expected to make their own utensils". [Bollong et al. 1996: 273-274]

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28	K.P. Thunberg traveller account 1770/1772 **[2, 4]**	Khoe pastoralism	Camtous River Eastern Cape, South Africa (Gamtoos)	-33,9123333S 25,0208472E	skin bag basket clay	boiling food water or milk container pots	"They boil the food in water in skin bags with stones heated to glowing point." [Sydow 1967: 18] "In the vicinity of the Camtous River I found pots of baked earth made by the Hottentots themselves. Here I also saw baskets plaited by them, which were so tightly woven that they could hold water and milk." [Sydow 1967: 18]
30	Sparrrman traveller account 1772-6 **[2]**	Khoe Pastoralism	southern Cape coast Eastern Cape, South Africa (Great Kei)	-32,6446056	clay	boiling and stewing	Khoi vessels were also mentioned by Sparrman [1775-9][Bollong et al. 1996]
31	H.J. Wikar traveller account 1778/1779 **[4]**	Geisqua [Twin People] who are descended from the Blicqua Bechuanas.	Upper Orange River Northern Cape, South Africa (Namies)	-29,2757611S 19,2729778E	Wood (osier) clay	- -	"…and make their own vessels from osier wood in the form of deep, narrow-necked pots [the so-called Bambus] which are not badly hollowed out with iron implements. which they get from the Blicqua" [Sydow 1967:19]
32	W. Patterson traveller account 1797	Khoe pastoralism	Mouth of the Orange River Northern Cape, South Africa	-28,5268583S 16,8296306E	ostrich eggshell	water carrying	"They fetch water in ostrich eggshells and seal bladders." [Sydow 1967: 18]

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	[4]		(Orange River mouth)				
33a	R.J. Gordon traveller account 1779 **[2]**	Khoe Pastoralism	Lower Orange River (near Kakamas) Northern Cape, South Africa (Kakamas)	-28,7590472S 20,5431833E	clay	pots for cooking	"…they knead it and use it for baking their pots, which are not very hard but satisfactory for general use and for cooking." [Bollong et al. 199: 74] "…in a pot is put some of the steenbok, because the steenbok had to last as long as the slaughter lasts." [Bollong et al. 199: 274]
33b			Ellemboogfontein Northern Cape, South Africa (Garies)	-30,5589028S 17,9918361E			
34	S.Daniel Painted depiction AD1801 **[2]**	‘‘Korah Hottentots preparing to remove’’ pastoralism	Prieska; Orange River Northern Cape, South Africa (Prieska)	-29,708375S 22,7388139E	Clay Wood Gourd	- - -	clay pottery was also observed: "One being a reddish pot-bellied container with a narrow cylindrical neck. Although suspended from the fork, an actual lug is not depicted. The second is a greyish bowl which closely resembles the Bushman bowl depicted a dozen years later by Burchell" [Bollong et al. 1996: 275] two wooden vessels [both cylindrical with flat bottoms] already suspended [Sampson 1997; pp275] and a probable gourd container hanging from a forked bough. A second wooden vessel is observed standing on the ground [Bollong et al. 1996: 276]

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35	Albrecht traveller account 1806 **[2, 4]**	Namaquas pastoralism	Warmbad Mission Station north of the Orange River southern Namibia-Northern Cape, South African border (North of the Orange River)	-28,4811167S 18,8077111E	Wood (osier) Gourd Clay	milk and water containers	‘‘The Namaquas use earthen pots for cooking meat’’ [Bollong et al. 1996: 276]. “Their industry consists mainly in the making of mats for the houses, in the making of karosses, weapons, bows and arrows and assegais, in the cleaning and drying of large, bottle-shaped gourds or calabashes for holding milk and water, in the hollowing-out of bamboo for use instead of pails etc...they are very skilled in the making of wooden pitchers and bowls, for which they use the wood of willows [osiers] that grow on the banks of the Orange River. These vessels are very well made and of various sizes." [Sydow 1967: 22]
36	Burchell traveller account 1811 [1960 publication date **[16]**	Pastoralists -	Orange River, Griqualand West Northern Cape, South Africa (Griekvastad)	-28,18625S 20,7119694E	Wood (osier)	-	N.D. -
37	D.R. Kannemeyer traveller account 1880’s **[2]**	Khoe pastoralism	Burghersdorp, north of Stormberg Eastern Cape, South Africa (Stormberg)	-31,5115583S 26,2661667E	clay	pots	"the ears or handles one sees so often in Hottentot pottery"…"I have never seen signs of grass having been mixed with clay." [Bollong et al. 1996: 276]

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38	G. Stow traveller account 1820 **[4]**	pastoralists with pack oxen	Griqualand West Northern Cape, South Africa (Griekvastad)	-28,7846028S 23,2386056E	Wood clay	containers	various utensils, wooden and earthen vessels, red paint stone, powder of blinkklip, corn, karosses, etc. [Sydow 1967: 18]-
39a		Namaqua pastoralism	Gariep River, Namaqualand Northern Cape, South Africa (Gariep)	-29,185225S 20,6584639E	leather	sacks for honey	Sacks for collecting of honey [Alexander 1967: 109 [Vol.1]]
39b	James Edward Alexander traveller account 1834	Little Namaqua pastoralism	Kama, Namaqualand Northern Cape, South Africa (Namaqualand)	-29,8791278S 17,8332472E	wood	-	"The general fare of old and young was the milk of their cattle or goats collected in cylindrical wooden vessels, called "bambus", they had often only this simple ware morning and evening for weeks together; they are reluctant to kill their sheep unless they meet with injury, to kill a heifer is a rare occurrence, so that if not successful in procuring game, such as the eland, springbok, or ostrich, they content themselves with milk, a lump of gum and roots discovered by their leaves appearing on the surface after rain." [Alexander 1967: 97-98 [Vol1.]].

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39c	**[17]**	Hill Damara pastoralism	Swakop River to the Little Koanquip River Namibia (Sesfontein)	-22,3847139S 15,8414083E	clay	cooking pots [conical shaped]	"By the doors of the huts lay bows and arrows, like those of the Namaquas; and in the grassy covering of the huts was stuck the usual throwing assegai. Clay cooking pots of a conical shape were in very hut. [Alexander 1967: 135 [Vol.2]].
39d		Hottentots'	Karas region southern Namibia (Karas)	-27,2498444S 16,9516167E	Wood clay	Milk container -	"…; the mats are rolled up and tied along the boughs on the backs of oxen, the earthen cooking pots and milk bambus hang from forked sticks on each side"[Sydow 1967: 20]
40	Tindall Missionary 1852 [1959 - publication date] **[16]**	Great Namaqua pastoralism	Lieliefontien, Namaqualand Northern Cape, South Africa (Lieliefontein)	-30,3024278S 18,0850222E	the use of fat to smear onto bambus [wooden containers]	prevent bambus from cracking.	After the jug was complete it had to be smeared with fat to prevent it splitting. Tindall (1959) reported in 1852 that the Great Namaqua were so destitute around his mission that they were unable to make the bambus because they did not have the fat necessary to rub it and so prevent it from cracking. [Webley 1992: 76-77]
41	E.J. Dunn traveller account 1871 **[2]**	Nama pastoralism	south bank of the Orange River Northern Cape, South Africa (Orange River mouth)	-28,3148222S 16,9249944E	clay	Pots for cooking and holding water and bowls 'basins' for holding food or for drinking.	"It was they [Hottentot women] who made the pottery….I saw earthenware cooking pots up to a capacity of two or three gallons being used by the Hottentots."…"I came across a number of Hottentots who were trekking, and saw them using their cooking and other vessels. Besides the larger one, used for cooking, or holding water, were smaller ones like basins for holding food or for drinking from." [Bollong et al. 1996: 276]

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42	Hahn traveller account 1881 **[2, 3, 16]**	Nama pastoralism	Namaqualand Namibian-Northern Cape, South Africa Border (southern Namibia)	-28,1916194S 18,2017861E	Calabash clay	butter making -	"...it was also used for churning purposes as butter could be produced by shaking it." "the Namaqua of the present day still make pots in the old style with clay sand and ground quartz." [Bollong et al. 1996: 276]
43	Hoernlé Ethnography 1912-1923 [1985 - publication date] **[18]**	Nama pastoralism	Walfish Bay Namibia (Walvis Bay)	-22,9968194S 14,6845972E	n.d. (clay?)	water pot Death Ceremony and the use of pots Water and the use of pots, the importance of black soot from a cooking pot	Part of the !nau ceremony: "Next a visit is made to the spring. The girl carries her water pot, (//ko-es) on her head. Arrived at the spring, the women with a branch from a tree strikes the water, scattering it over the girl. She then rubs the girl's legs and arms with clay, fills the pot, and places it on the girl's head. The girl is then free to draw water as she pleases." [Hoernlé 1985: 66]. "Meantime the man's relatives slaughter animals according to their means, and collect the blood separately into one or more pots. The entrails are collected in other pots, and the meat in yet others. The … is heated to boiling point, and the herb called //gànab is mixed with it...Then the old man, who is related neither to the man nor to the women, takes potblack and makes a line on the stomach of each person - "to prevent their getting pains from eating the food", says !Amatis." [Hoernlé 1985: 72] "A similar ceremony takes place when the Nama goes visiting relatives in another tribe. The head of the kraal visited must take wet clay and black from the pot, and put a broad stripe on the visitor's forehead, so that he may be able to "eat nicely and drink nicely" as my informant put it." [pp 82]. The use of soot black from the pots is also very interesting...It is always used as a sign that one is being admitted to the full life of the society, and so to its protection. Thus, one must put a

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							black mark on a baby when it visits one's weft for the first time, otherwise it will be ill, and after a period of isolation from the full life of the tribe this black mark is always put on the forehead at the ceremonial meal which signalizes the reintroduction to full social life." [Hoernlé 1985: 83].
44	Schapera Publication 1930 **[1]**	Nama Pastoralism	Richtersveld Namibian-Northern Cape, South Africa Border (Richtersveld)	-27,7092667S 17,7053639E	Wood (*acacia*) leather sacks calabash	sour milk	In the summer, after good rains, milk is abundant, and the people then live almost entirely upon it. The fresh milk, either warm from the cow or cooled down, is mixed with some vegetable substance, such as the green leaves of the ebony wood, which are chewed and spat into it, or the sap of the acacia; and the thick sour milk thus produced forms the staple article of diet for the Hottentots. It is kept in beautifully simple vessels carved from wood, and is carried about in soft skin bags. Some of it is also converted into butter. The milk is poured into a calabash, the narrow opening of which is closed with a cork. Occasionally the freshly-cut thick roots of a certain plant (? *Portulaca* sp.) are put in with the milk to increase the yield of butter. The calabash is rolled to and for on some skins, in full sunlight or near the fire; and after about three hours of this rolling it is gently shaken, so that the butter which has formed can gather on the surface. The remaining liquid is then run off and drunk, and the butter heaped up in a wooden pail. [Schapera 1930: 237].
45	H. Vedder Missionary 1938	Nama pastoralism	Okahandja Namibia (Okahanja)	-21,9833333S 16,9166667E	wood buckets clay	milk	"In the house were kept the household utensils: wooden bowls and milk buckets, tubs, spoons and other milk receptacles which the husband cleverly fashioned with a small, curved axe. It was the women's work to make earthenware pots, with narrow necks, wide middles and pointed bottoms, and to bake them in hot wood-coals." [Sydow 1967: 30]

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	[4]				Wood ostrich eggshell clay	Milk containers Water containers cooking meat	"Against the wall of the simple hut and on the floor, stood earthenware pots laboriously fashioned by the wife, milk buckets hewn out of wood by the husband, and ostrich eggshells with small openings, in which drinking water was kept." [Sydow 1967: 30] "If the rain stayed away for a long time, the people tried to bring it about magically by the following process: A cattle-owner would give a pregnant cow, which had never had a calk before, to be slaughtered. The blood was caught up and the meat cooked in large earthen pots. This being done the owner of the cow would come up to the still blazing fire and pour both the meat-soup and the blood into it in order to extinguish it." [Schapera 1930: 380].
46	I. Rudner Archaeology and ethnographic 1956 **[3]**	Khoe pastoralism	Klein Karas Namibia (Klein Karas)	-27,561763S9 18,0776639E	Wood clay	vessels	In 1956 an old Bondelswart Hottentot at Klein Karas told me that all the potsherds in that area were of Bondelswart origin, and that, apart from the wooden vessels, he had also seen a few clay ones when he was young, but 'all who made them are now dead'. [Rudner 1979: 9]
47a	E.R.Scherz collected item **[4]**	Hottentot'	Sesfontein Reserve, southern Kaokoveld Namibia (Sesfontein)	-19,1245306S 13,6174917E	wood	milk container	milk container made from carved wood and decorated

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47b	H. Schinz traveller account 1884/1887 **[4]**	Herero pastoralism	Omburo, Omaruru Namibia (Omaruru)	-20,4689639S 16,6535528E	Wood Gourd skin	skin for holding fat	"The inventory of the main hut, that of the chief wife, consists mainly of a large number of hollowed-out, egg-shaped mixing vessels of all sizes, made from tree stumps, hollow bottle-shaped gourds, shallow containers. A wide-bellied earthen pot serves as a cooking vessel; small cylinder-shaped jugs from ox horns with bottoms and lids formed of stretched skin for storing ointments, while round vessels made entirely of skin and smeared with cow dung contain the fat. ... The area of pottery seems to be as little known to them as that of the working of ore. Yes, on the contrary, they despise such handiwork and prefer to pay the Aandonga [Ondangua] people [living in [Ov]Amboland who visit them from time to time, high prices for such work..." [Sydow 1967:24]
48	Schwind collected item **[4]**	Herero pastoralism	Ovitoto Reserve, Okahandja District Namibia (Okahandja District)	-21,9760778S 16,9070389E	wood	container with lug and milk containers	A heavily weathered container from a deserted living site in the Herero Ovitoto Reserve. It is undecorated apart from the unpierced lug. a milk container with a scoop and a meat dish. Collected from an old living site.
49	Swakopmund Museum collected item **[4]**	Herero pastoralism	Otjihorongo Reserve, Omaruru District Namibia (Otjihorongo Reserver)	-20,4689639S 16,6535528E	wood	milk container	A Herero milk container made from a single piece of wood.
50	W. Sydow collected item **[4]**	Herero pastoralism	Otjimbingwe Reserve, Karibib District Namibia	-21,9527167S 15,8624028E	wood	milk container	A milk container in a deserted Herero hut.

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			(Karibib District)				
51	O.O. Hart collected item **[4]**	Himba pastoralism	Kaokoveld Namibia (Kaokoveld central location point)	-22,343675S 15,8779667E	wood	bowl	A bowl made by Himba in the Kaokoveld. The form is perhaps inspired by the Ovambo clay bowl.
52	Malan and Smith Ethnobotany 1974 [publication] **[19]**	Himba and Herero pastoralism	Kaokoland Namibia (Kaokoveld central location point)	0	fibre baskets (*hyphaene ventricosa*)	n.d.	-
53	M. Jacobsohn Ethnoarchaeology 1986 – 1991 **[20]**	Himba [Purros Community] pastoralism	Purros, Kaoko, Kunene District Namibia (Purros)	-18,7737389S 12,9507694E	gourd		-

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54	Sparrman traveller account 1772-6 **[21]**	Gonaqua pastoralism	southern Cape coast Eastern Cape, South Africa (Great Kei)	-32,6446056S 27,9569139E	baskets	Milk baskets	"…but the vessels they milked it into were baskets of a peculiar kind, composed of roots plaited together so curiously, and in so close a manner, they would not only hold milk but even water. These vessels would be as neat as they are light, if the Hottentots did not always neglect to wash them. Indeed, most of these baskets had acquired such an appearance from the milk being encrusted upon them, as at first induced us to suppose that they were besmeared with cow dung, in order to make them hold the liquor better. But I have since tried baskets, that were quite new and clean, particularly one that I had brought home with me, that without any kind of daubing, they did not leak in the least. ... Holding from a pint and a half to four gallons; and besides the advantage of being very light, they have likewise that of their rims being sufficiently pliable." [Shaw and Warmelo 1974: 149-150]
55	Le Vaillant Traveller account 1782 **[21]**	Gonaqua pastoralism	General Area [location not provided] Western and Eastern Cape, South Africa (between Swartkop and Buffalo Rivers)	-33,2578083S 26,1169194E	baskets	traded	baskets traded from Xhosa
56	Hubberly Traveller account 1782 **[21]**	Gqunukhwebe pastoralism	General Area [location not provided] Western and Eastern Cape, South Africa (between Swartkop and Buffalo Rivers)	-33,2578083S 26,1169194E	basket	milk or curdled milk	"The chief before the last of the cows were turned out brought a kind of bowl made of rushes, but so closely wrought together as to hold liquid, of which there was some in it. The new milk being then added, turned it instantly to curds.' [Shaw and Warmelo 1974: 241].

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57	Bain Traveller account 1829 **[21]**	Gqunukhwebe pastoralism	General Area [location not provided] Western and Eastern Cape, South Africa (between Swartkop and Buffalo Rivers)	-33,2578083S 26,1169194E	baskets	milk	n.d.
58a	Lavanha Traveller account 1593 **[21]**	Xhosa agro-pastoralism	Umtata River Eastern Cape, South Africa (Mtata River)	-31,7113833S 28,89595E	wood	-	"They use vessels of clay dried in the sun, and some of wood carved with small iron axes, which are like wedges set in a piece of wood: with these they also clear the thickets" [Shaw and Warmelo 1974: 140].
58b		Cape Nguni agro-pastoralism	Umzimvubu Eastern Cape, South Africa (Mzimvubu)	-31,4646389S 29,3504667E	leather	milk	"Climbing a mountain which was near the camping place, they came upon a good road, where many brought a quantity of milk, of which they gave a leather bag full…" [Shaw and Warmelo 1974: 240].
59	Paterson Traveller account 1777-9 **[21]**	Xhosa' agro-pastoralism	General Area [location not provided] Eastern Cape, South Africa	-32,2372333S 28,1426722E	baskets	watertight	"…but the construction of the baskets, which are made by their women, is much more surprising; they are composed of grass, and woven so closely that they are capable of holding any fluid." [Shaw and Warmelo 1974: 150].

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			(between the Kei and Mbashe Rivers)				
60	Barrow Traveller account 1797 **[21]**	Xhosa agro-pastoralism	General Area [location not provided] Eastern Cape, South Africa (between the Kei and Mbashe Rivers)	-32,2372333S 28,1426722E	baskets	milk	"In the evening they sent us in return some baskets of milk. These baskets were made from a species of *cyperus*, a strong reedy grass that grew in the springs of Zuure Veldt….The women informed us that the making of these baskets was one part of their employment....They were all nearly made after one model, which in shape was that of a common beehive." [Shaw and Warmelo 1974:366].
60		Xhosa agro-pastoralism	General Area [location not provided]	-32,2372333S 28,1426722E	*Zamia cicadis*	curdling milk	"The *Zamia cicadis*, a species of palm, grows wild in almost every part of the country, and is sometimes used, as a substitute for millet, to mix with milk as a kind of furmety." [Shaw and Warmelo 1974: 366].
61	Carmichael Traveller account 1806-15 **[21]**	Xhosa agro-pastoralism	General Area [location not provided] Eastern Cape, South Africa (between the Kei and Mbashe Rivers)	-32,2372333S 28,1426722E	leather	Milk bag	"They preserve it [milk] in leathern bags; and as these extraordinary vessels are never scaled, and but seldom emptied, the fermentation constantly going on within them partakes more of the putrefactive than of the acetous" pp 243.

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62	Steedman Traveller account 1820-31 **[21]**	Xhosa agro-pastoralism	General Area [location not provided] Eastern Cape, South Africa (between the Kei and Mbashe Rivers)	-32,2372333S 28,1426722E	leather sack (cow) gourd	Milk container	"…there is usually a milk-sack made of bullock's hid, so closely sewn together as to prevent leakage, and capable of containing several gallons, but the poorer classes are content to keep their milk in calabashes." [Shaw and Warmelo 1974: 244].
63	Thompson Traveller account 1821-4 **[21]**	Xhosa agro-pastoralism	location not provided Eastern Cape, South Africa (between the Kei and Mbashe Rivers)	-32,2372333S 28,1426722E	Wood baskets	milk and other liquids [baskets]	"They use also a few wooden vessels, carved out of soft wood; and their rush baskets are well known, which are so closely woven as to retain milk and other liquids." [Shaw and Warmelo 1974: 140].
64	Smith Traveller account 1824-5 **[21]**	Xhosa agro-pastoralism	General Area [location not provided] Eastern Cape, South Africa (between the Kei and Mbashe Rivers)	-32,2372333S 28,1426722E	Baskets leather bags (sheep ?)	Milk containers	"Use curdled or thick milk/ Milk into baskets of twisted grass woven by women quite waterproof not always very clean…pass the milk into leathern bags or bottles, a projecting neck at one end, wooden cork. They are made of [? sheep] skin or small calf skin body drawn through the neck and legs cut off and tied." [Shaw and Warmelo 1974: 244]. -

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65	Morgan 1833 **[21]**	Xhosa agro-pastoralism	General Area [location not provided] Eastern Cape, South Africa (between the Kei and Mbashe Rivers)	-32,2372333S 28,1426722E	leather sacks	milk	"Their attention is however chiefly engaged by their cattle:- these they herd, protecting them with great care ….The milking them also is the work of men, as is the making and repairing of the folds; the bags for holding the milk are their work; these they make of raw hides which are so firmly sewed together by thongs of the same material as to be quite impervious to their contexts" they are large, each being capable of holding several gallons; and a neck is left at one corner which is tied round with a string to secure the milk." [Shaw and Warmelo 1974: 245]
66	Martin 1836 **[21]**	Xhosa agro-pastoralism	General Area [location not provided] Eastern Cape, South Africa (between the Kei and Mbashe Rivers)	-32,2372333S 28,1426722E	leather sacks	milk	"A milk -sack of oblong form, made of cow-skin, with the flesh-side out, and having the hair carefully removed, was lying at the door of one of the huts as we passed. It was about four feet long and three wide, and had a neck at one corner, for the admission and discharge of the precious beverage, which undergoes a slight fermentation and would burst a less elastic vessel, if closely stopped. The number of these sacks at a kraal depends upon the population and their wealth in cattle; they are placed under the charge of one man, who opens them only at milking-time, in the forenoon, and after sunset." [Shaw and Warmelo 1974: 246].

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67	King 1851-5 **[21]**	Xhosa agro-pastoralsim	General Area [location not provided] Eastern Cape, South Africa (between the Kei and Mbashe Rivers)	-32,2372333S 28,1426722E	leather sacks	milk	"...the warm milk just taken from the cow, into these skins or sacks made of bullock's hide, which soon became quite saturated with the milk constantly kept in them, and have a very sour disagreeable smell. The warm milk poured into these, upon the quantity of the old milk always left in them, instantly curdles, and gets rapidly into a state of fermentation. The curdle is all nicely broken by a sort of kneading, rolling and shaking of the milk sack.' [Shaw and Warmelo 1974: 247].
68	Stanford 1899 **[21]**	Mpondo agro-pastoralism	General Area [location not provided] Eastern Cape, South Africa (between the Umtata and Umzimvubu Rivers)	-31,7544361S 29,1531167E	baskets	beer	-
69	Kidd 1904 **[21]**	Cape Nguni agro-pastoralism	General Area [location not provided] Eastern Cape, South Africa (between the Kei and Mbashe Rivers)	-32,2372333S 28,1426722E	calabash	curdled milk	"When the milking is over the milk is taken into the hut, and is immediately placed in the milk sac or calabash. This is never cleaned out, but contains a strong ferment which makes the milk clot immediately. Sweet milk is but food for babies, and only a few tribes would drink it. But clotted sour milk is food for men. The calabash has a small plug at the bottom by which the natives let off the whey, the curds being the only part they care for." [Shaw and Warmelo 1974: 250].

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70	Soga Publication 1932 **[21]**	Xhosa agro-pastoralism	General Area [location not provided] Eastern Cape, South Africa (between the Kei and Mbashe Rivers)	-32,2372333S 28,1426722E	leather sack calabash baskets	Milk and sour milk containers	“A milk -sack is called "intsuba", and is probably from an old term for skin-bottle…” [Shaw and Warmelo 1974: 252]. "One the death of the head of nay family the milk-sacks (im-vaba) are cut open and destroyed as a sign of mourning. On the other hand, in the case of the death of a member of the family, other than the head, the milk-sacks are not cut or destroyed, but the milk is emptied out upon the ground.' [Shaw and Warmelo 1974: 252]. The milking thong and milk-pail always go together. The one to tie the cow's legs, the other to receive the milk.' [Shaw and Warmelo 1974: 252]. …apart from the fact the even this milk-pail that he uses, whether it is the one made of rush or any other kind of thing, is kept by him personally at a certain place that he himself had selected in the home….His milk-pail will neither be handled nor used by anyone else, as also the rime he uses for milking (hence the saying 'the rime and the milking pail')...Soon after the milling he must personally go to pour the milk into the calabash (iselwa) or leather milk-sack (imvaba) and after mixing the milk and the remains of sour milk left in the milk-sack he shakes it. It is he also who does the pouring out because nobody besides himself handles the calabashes at this home. [Shaw and Warmelo 1974: 254].

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71	Fox 1939 **[21]**	Cape Groups	General Area [location not provided] Eastern Cape, South Africa (between the Kei and Mbashe Rivers)	-32,2372333S 28,1426722	calabash	sour milk	"The warm milk is poured straight from the milking into a calabash already containing a little amasi. A common sight at midday at the Kraals, whilst milking is proceeding, is an array of calabashes waiting in the sun to be filled; amongst these is the baby's own small gourd, encased in a cord-carrying attachment for the mother to take on her journeys. The amasi will be ready for use in about two or three hours according to the weather, and the amount of amasi originally there. Amasi may be prepared in a stone jar, but this is does not impart the same flavour. It takes quite a time for a calabash to become "seasoned", but when once in order it can be used for years. It should be washed out every two weeks or once a month, but not too often. If whey separates it is drunk as intloya, especially in hot weather to quench thirst whilst the hard curd is termed ingqaka, If the product is too sour it is mixed with fresh milk. To separate fat intentionally is wasteful, but it may be used if it separates accidentally." [Shaw and Warmelo 1974: 255].
72	Shaw Historical review 1974 **[21]**	Xhosa agro-pastoralism	General Area Eastern Cape, South Africa (between the Kei and Mbashe Rivers)	-32,2372333	Gourd baskets and mats (*cyperus textilis, genus Ficus*) skin bag	curdled milk or for storing seeds - - sour milk	"They are cut with a knife and the seeds are removed when dry. The dame method is applied in making a ladle, a calabash for curdled milk or a calabash for storing pumpkin seed." [Shaw and Warmelo 1974:148]. "The milk-pail (ithunga), used by Xhosa, Thembu, and Hlubi until the beginning of this century, was a closely coiled basket made of sedge stems. These are no longer used and store-bought buckets or cans have taken their place. Bomvana, Mpondomm Bhaca, and Xesibe used, and all but the latter still used in 1948, a wooden pail, which was also known to the Xhosa. Several species of wood were used. Soga says a soft wood, especially umhlangwe, was used by the Xhosa; other Xhosa informants

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					wood (*Cussonia spicata*)		mentioned umsenge (Cussonia spicata, cabbage tree). The Bhaca also used a pot, as did the Zizi a century ago. In 1956 informants said that a wooden pail was preferred by many even where metal buckets were available, because the latter ruse... Milk is not used fresh, except possibly by children and dogs. After milking it is poured into the container in which it is to curdle into amasi, thick curds, in which form it is eaten. Until quite recently, in well-to-do families throughout the tribes, the container was a sack (imvaba) made of two rectangular pieces of raw ox- or goat-hide, with the hair removed and the fleshy side outward, sewn together with things and having an opening at one corner which was tied firmly with a thong. In poor families a calabash, fitted with a stopper, was used instead."
73	Duggan-Cronin Publication 1949 **[21]**	Mpondo, Mpondomise agro-pastoralism	General Area [location not provided] Eastern Cape, South Africa (between the Umtata and Umzimvubu regions)	-31,7544361S 29,1531167	Baskets (*Hyphaene crinite*)	beer	Most kraals…made their own huts, and often their own pottery and baskets as well.' …Beer traditionally was served in beautifully sewn baskets…. Beer-baskets are made by men from the leaves of the ilala palm. Other types of baskets, and mats, are made by women'. [Shaw and Warmelo 1974: 155].
74	Hunter 1932 **[21]**	Mpondo agro-pastoralism	General Area [location not provided] Eastern Cape, South Africa (between the Umtata and Umzimvubu regions)	-31,7544361S 29,1531167E	calabash	Household item	Calabashes are kept on the men's side of the hut; only the individual calabashes of grand-children are sometimes hung on the women's side so that the mothers may have access to them. After the death of a member of the owner's own clan, or related clans, milk is spilled out of all except the children's calabashes.' [Shaw and Warmelo 1974: 253]. Each baby has its own special calabash, but sweet milk is never given, except under European influence.' [Shaw and Warmelo 1974: 253].

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75	Shaw Historical review 1974 **[21]**	Mpondo agro-pastoralism	General Area Eastern Cape, South Africa (between the Umtata and Umzimvubu regions)	-31,7544361S 29,1531167E	Wood (*Erythrina latissimi, Cussonia spicata*) plaited basket (*Hyphaene crinita*) skin bag calabash	milk pails Sour milk	Mpondo term [umnqwane]l used to make milk pails. ulala refers to a plaited drinking-vessel, or for milking into or a basket. Hyphaene crinita (palm leaf) is used only in Pondoland and Griqualand East. [Shaw and Warrmelo 1974:159-60]. See reference to Account Number: 72.
76	Shaw Historical review 1974 **[21]**	Bhaca agro-pastoralism	General Area Eastern Cape, South Africa (Mount Frere)	-30,870975S 28,9790056E	Wood (*Cussonia spicata*) Skin-bag Calabash	Sour-milk	See reference to Account Number: 72

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77	Shaw Historical review 1974 **[21]**	Hlubi agro-pastoralism	General Area [location not provided] Eastern Cape, South Africa (Mount Fletcher)	-30,6920583S 28,5006444E	Wood (*Cussonia spicata*) Skin-bag Calabash	Sour milk	See reference to Account Number: 72
78	Shaw Historical review 1974 **[21]**	Bomvana agro-pastoralism	General Area [location not provided] Eastern Cape, South Africa (Elliotdale)	-31,9114583S 28,6581611E	Wood (*Cussonia spicata*) Skin-bag Calabash Basket	sour milk Beer and milk	In the west of the area, as has already been mentioned under 'animal husbandry', the common milking vessel until the beginning of this century was a basket. The baskets are said to have been shaped like an inverted beehive, and as far as can be deduced from the descriptions and from Sparrman's Gonaqua basket, were closely coiled with simple or furcate over sewing; both foundation and sewing strand were of sedge stems. ...Sour milk was served in other baskets of the same kind which varied in size from a diameter of about 40cm at the mouth and holding a number of litres, to quite small. From these the milk was either scooped with a calabash or a whisk, or, in the case of smaller ones, drunk directly. ... . Some authors seem to have been under the impression that the milk was put into the baskets to curdle and that for this reason they were never washed, but there is no reason to suppose that this was usual practice. Curdling took place in the milk sacks or calabashes into which the milk was poured from the milking-basket after milking. pp 409. ...Alberti states that the milk-baskets were used for holding boiled meal that was put to ferment in the process of making beer, to which Lichtenstein adds that the process was aided by the bacteria of fermentation already in the basket. Informants denied that this was done, and in view of the restrictions regarding milk, it is more likely that they were similar baskets but confined to that use.

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79	Cook Publication 1931 **[21]**	Bomvana agro-pastoralism	General Area [location not provided] Eastern Cape, South Africa (Elliotdale)	-31,9114583S 28,6581611	calabash	sour milk	"On the fifth day she [the mother] is given a separate calabash of sour milk which she keeps in her own hut…The woman's calabash is called imbikata. When the baby starts to consume amasi it is also given an imbikata." [Shaw and Warmelo 1974: 251].
80	Bonatz 1834 **[21]**	Thembu agro-pastoralism	General Area [location not provided] Eastern Cape, South Africa (Ngcobo)	-31,7515972S 28,0260722E	baskets baskets	Watertight milk baskets milk	"women make watertight baskets." [Shaw and Warmelo 1974: 152]. "At sun-rise they creep out of their round huts, each with a round milking basket in his hand, skilfully manufactured by the women, and hasten to the cattle kraal" [Shaw and Warmelo 1974: 245].
81	Shaw Historical review 1974 **[21]**	Thembu agro-pastoralism	General Area [location not provided] Eastern Cape, South Africa (Ngcobo)	-31,7515972S 28,0260722E	plaited basket (*Hyphaene crinita*)		ulala refers to a plaited drinking-vessel, or for milking into or a basket. *Hyphaene crinita* (palm leaf) is used only in Pondoland and Griqualand East. [Shaw and Warmelo 1974: 159-60].
82	Phillips 1825	Thembu agro-pastoralism	General Area [location not provided] Eastern Cape, South Africa (Ngcobo)	-31,7515972S 28,0260722E	Baskets Leather sack	milk	"…curdled milk was brought to us. They never drink it but in this state, and it soon turns, from being kept in a bag made out of a hide, from whence it is taken when wanted in the little neat baskets made of rushes." [Shaw and Warmelo 1974: 244".

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83	Shaw Historical review 1974 **[21]**	Thembu agro-pastoralism	General Area [location not provided] Eastern Cape, South Africa (Ngcobo)	-31,7515972S 28,0260722E	Wood (*Cussonia spicata*) Skin-bag Calabash	sour milk	See reference to Account Number: 72
84	Carter 1782 **[21]**	Mbo agro-pastoralism	General Area [location not provided] Eastern Cape, South Africa (between the Umtata and Umximvubu regions)	-31,7544361S 29,1531167E	leather bag	churning milk to make butter	"The milk was put into a leather bag, which being hung up in the middle of the hut, was pushed backward and forward by two persons standing at the sides; and this they continued to do, till the butter was arrived at a proper state of consistence." [Shaw and Warmelo 1974: 241].

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85	Shaw Historical Review 1974 **[21]**	Xesibe agro-pastoralism	General Area [location not provided] Eastern Cape, South Africa (Mount Ayliff)	-30,8157222S 29,3656139E	Wood (*Cussonia spicata*) Skin-bag Calabash	sour milk	See reference to Account Number: 72
86	Ross 1824 **[21]**	Amazizi agro-pastoralism	General Area [location not provided] Eastern Cape, South Africa (Peddie)	-33,3211056S 26,7255833E	Gourd clay	milk	"They have much cattle, sheep and goats; no horses. They do not know horses. The first which he saw was in Hintza's country…in his own country. There are hens there like ours…The men milk the cows…The milk from the cows is put into large calabashes with a wide mouth. They use clay pots in milking. They pour of [off] the tin of [from] the thick milk and use the thicker part." [Shaw and Warmelo 1974: 244].
87	James Stuart Historical Archive 19th century **[22]**	Zulu agro-pastoralism	Zululand KwaZulu-Natal, South Africa (Zululand, central location point)	-27,887225S 31,4456167E	gourd	water and milk	"Every day at midday and again at sunset, they drove the cattle into the central kraal. The cattle to be used for the king and the compound reserved for royal wives and female kin, or isigodhlo, were separated from the others, and after a time the calves would be separated. An inceku, a person specially assigned to collect the king's milk, would fill the king's milk pail from the special cows of the king. While he collected the king's milk, the 'cadets' would line up to drink from their assigned cows." [pp 4] ...."In addition to the milking, the izinceku also tended to the king's oxen and fetched water for the king in gourds" [pp 5]. The izinceku supplied milk to the isigodhlo, pouring it from their workaday

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							containers into pots kept by the women of the isigodhlo which were in turn poured into gourds by the mothers of the king's wives." [Bjerk 2006: 5].
88	Lindsay Hooper recording of museum and ethnographic collections 1981 **[23]**	Natal Nguni [Zulu] agro-pastoralism	Zululand KwaZulu-Natal, South Africa (Zululand, central location point)	-27,887225S 31,4456167E	Wood Calabash Wood (*Ficus ingens, Sclerocarya caffra, Rauvolfia natalensis, Ekebergia meyeri, Trema sp. and Saliz mucrinata*)	Holding milk rather than for milking into. milk storage meat dishes	"The pails were of two types. The first were tall cylinders narrowed at the base and top, and with two or more solid lugs near the rim. Varied in height between 45 to 60cm, 13 cm in diameter mouth. Carving of designs on lugs and round the mouth. The second type of pail, which might have been used for holding milk into, had a bulbous body about 35cm high, supported by four short legs and fitted with a rounded lid which might have served as a drinking-cup for milk. Decorative handles might be carved on a pail. [Hooper 1981: 215-216] "Amathunga were used for the milking only (wood), the milk being poured and kept in calabash containers" [Hooper 1981: 217]. "Zulu meat-dishes were of a distinctive type and specimens noted did not vary much in shape and decoration. They varied in length from 45 - 80 cm, with an average width of 29cm, and stood about 8cm high. The most common shape was a rounded rectangle, though circular meat-dishes were also made." [Hooper 1981: 218-219]

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			Msinga	-28,5533528S 30,4329444E	wood	meat dishes	"Meat-dishes from this area do not differ significantly in shape or dimension from those of Zululand." [Hooper 1981: 223]
			Drakensberg Area	-28,8921583S 29,2698056E	wood	meat dishes	"The only specimen seen is a Zizi meat tray very similar to the Zulu type." [Hooper 1981:224].

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89	Nettleton, A Publication 2018. **[24]**	Zulu agro-pastoralism	Zululand KwaZulu-Natal, South Africa (Zululand, central location point)	-27,887225S 31,4456167E	wood	-	Most wooden vessels recorded as having come from the homesteads (imizi; sing: umuzi) of isiZulu-speakers are identified as milk pails, amathunga. 27. These almost all took a modified cylindrical form, being hollowed vertically out of the log, with slightly swelling bellies, but no legs of any kind. J.G. Wood (1868: 62) gave a comparatively early account of the process of making of such vessels.... Wood's milk pail is devoid of decorative elements, having only two lugs/ears near the top, whose function was to prevent the pail from slipping between the milker's knees. It narrows somewhat towards the base, and is, probably, in most respects typical of milk pails from the region at the time.28. Certainly, by the 1870s, and probably for a long period before, milk pails were commonly elaborately decorated, as is evident from examples in the British Museum that Viscount Sir Garnet Wolseley collected during his short stay in Natal.29. In this context such elaborate decoration appears to have an important symbolic dimension. Milking, like all other chores associated with cattle among isiZulu-speakers, was restricted to males, yet women were invoked there also through the scarification marks in the decorative surfaces on the milk-pails.31. In most indigene's households in Natal and the Zulu kingdom, milk would have been soured in gourds kept in the umsamo at the back of the dwelling, as also noted by Mann (1862: 18), and then consumed, usually from widemouthed ceramic bowls [Nettleton 2018]

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90	P. A. W. Cook ethnographic observation of a Swazi ceremony 1930 **[24]**	Swazi agro-pastoralism	Zombode District Eswatini (Zombodze District)	-26,4456361S 31,2747861E	calabash	used in the *Inqwai* ceremony.	"Part of the Big Inqwai Ceremony (Pilgrimage to the sea): Prior to the pilgrimage to the sea, Vanyana and a couple of men go to the Royal Kraal for the calabash in which the sea-water is to be carried and which is kept at the Royal Kraal. A black beast is killed and a portion of the skin is used to cover the calabash..." "On arrival at the sea the party goes just before sunrise to the shore and, all naked, they sing the" Inqwala " song and fill the calabash...." "The party delivers the calabash and waits for the Inqwala to commence. The sea-water is used in the preparation of medicines by Vanyana, the doctor." [Cook 1930: 206].
91	S.M. Jones Swazi nutrition [clinical nutrition] 1959-1960 **[26]**	Swazi agro-pastoralism	Area included samples from multiple regions in Eswatini Eswatini (Manzini, central location point)	-26,6053222S 31,5385056E	Gourd Wood clay	dishes, scoops, containers for fermenting milk meat dishes and/or bowls cooking, beer brewing	"The fruit of the gourd is shaped into dishes, scoops and ladles. A gourd is used as the vessel in which milk is ripened to form curds (emasi) and whey (umlaza). The calabash (igula) for emasi has a hole at the bottom plugged with the skins of a special root. The igula is suspended in a grass harness near the roof of the hut. well out of the way of animals and young children, but in the warmth of the fire, when the emasi is ripe, the whey is withdrawn through the hole in the base of the calabash." [Jones 1963: 66] "Cooked meat is served in Swazi meat dishes made usually of two-coloured wood and round in shape standing on short legs. Frequently, two such bowls are joined in parallel. The bowls are carved by boys and men and have found favour with tourists. It is rare to find porridge in wooden bowls, they have been usurped by 'modern' containers, enameled iron, or aluminum dishes, and, more rarely, china plates." [Jones 1963:65] "Clay pots are the traditional cooking vessel of the Swazi and ceramics is an art practices by women specialists in the community. The utensils are manufactured close to suitable clay deposits, and the potter barters her

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							wares for the volume of grain or legumes that the pot will hold. Clay pots rarely have well-fitting lids and green leaves closely wrapped over are often used. In Addition to cooking, the clay pots are used for beer brewing. The ease with which the clay fractures has caused the majority of housewives to adopt the use of iron utensils, but beer is almost universally preferred in a clay pot." [Jones 1963: 64]
92	Lindsay Hooper recording of museum and ethnographic collections 1981 **[23]**	Swazi agro-pastoralism	General Area [location not provided] Eswatini (Manzini, central location point)	-26,6053222S 31,5385056E	Wood (*Pterocarpus angoensis, Kigelia pinnata)*	meat dishes milk pails	"Swazi meat-dishes consisted of a fairly deep oval bowl about 38cm long and 20cm wide, set on various types of support…The dish might have a handle with a hole for hanging cord on one side." [Hooper 1981: 260] Similar to Zulu milk pails [Hooper 1981: 261-262].

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Appendix 4
4.5 S1 Appendix. Database 2

4.5.1. References

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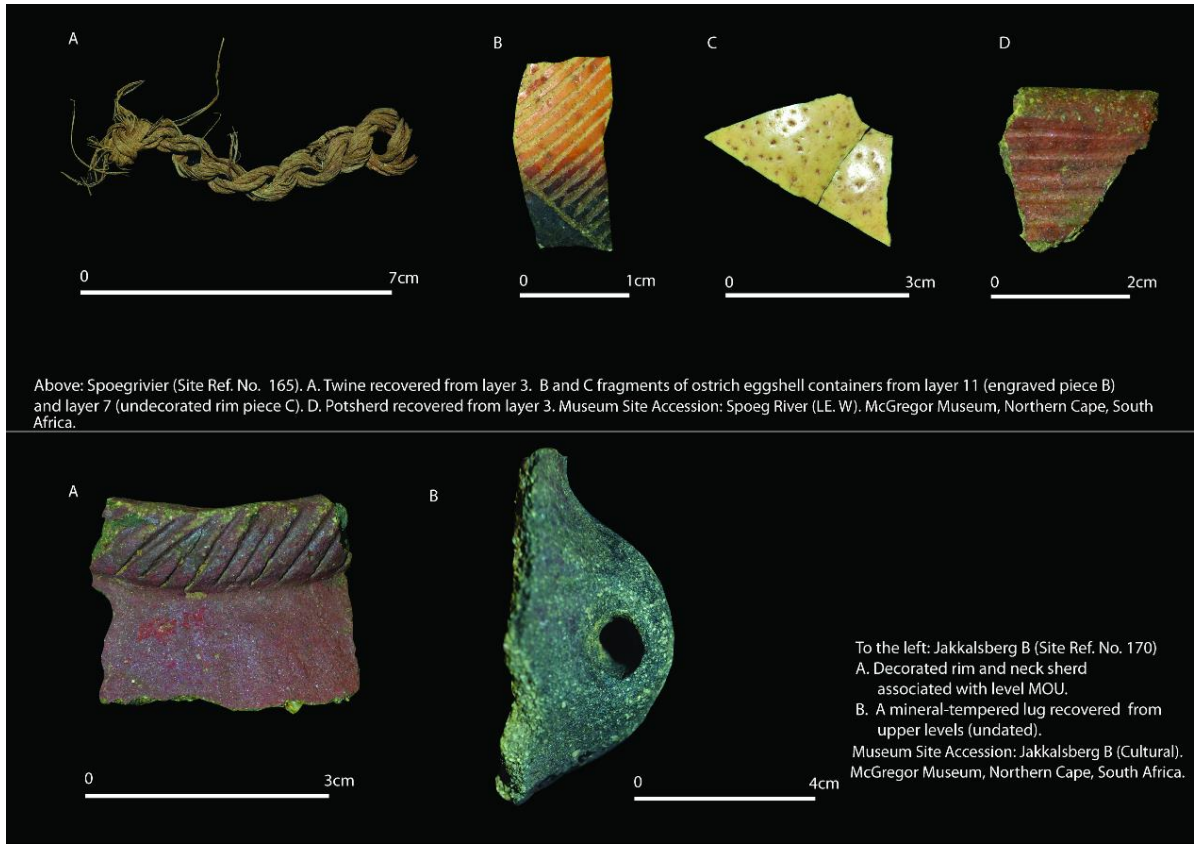
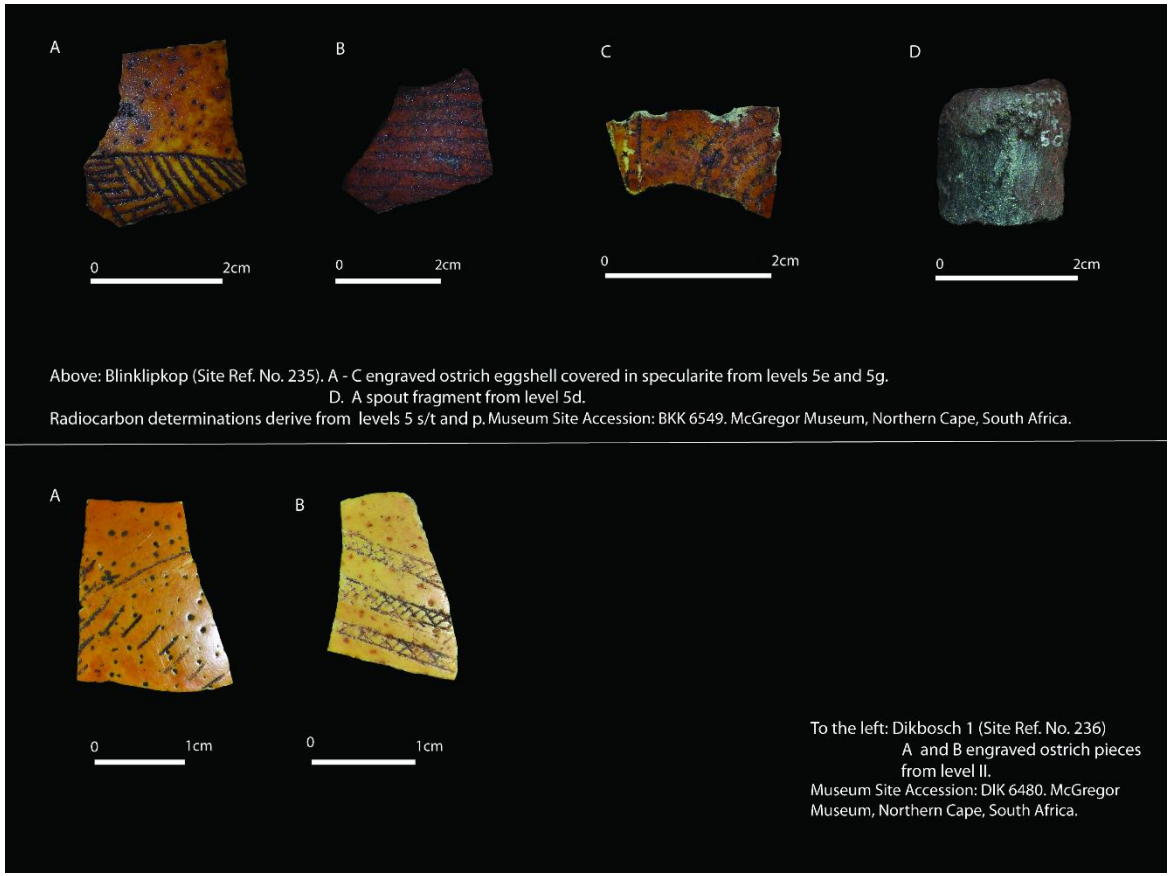
Appendix 4

4.6 S2 Appendix. Spoegriver (165) and Jakkalsberg B (170). Examples of fibre-tempered and mineral tempered pottery, twine and ostrich eggshell photographed during museum collection visits, 2017



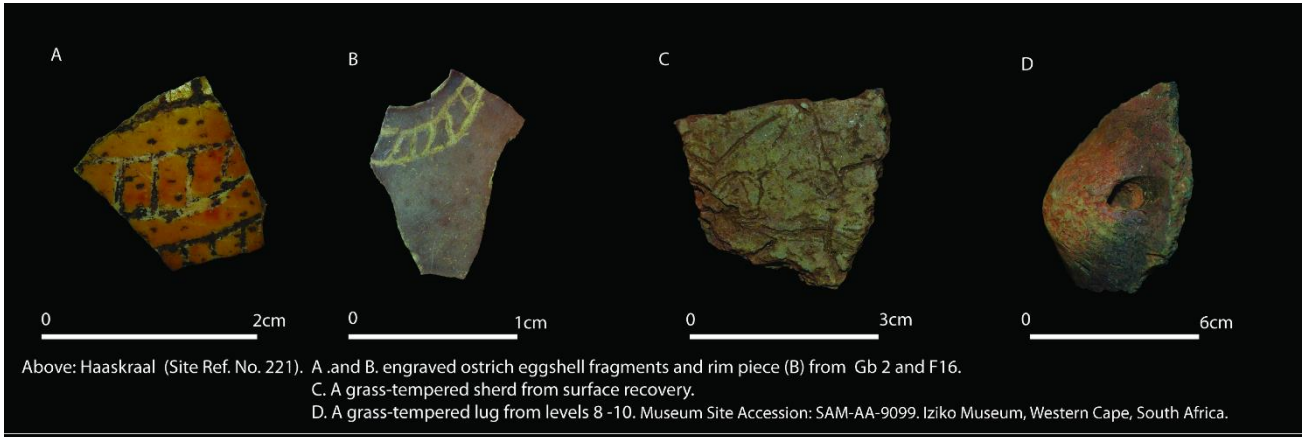
Appendix 4

4.7 S3 Appendix. Blinkklipkop (235) and Dikbosch 1 (236). Examples of mineral tempered pottery and ostrich eggshell photographed during museum collection visits, 2017.

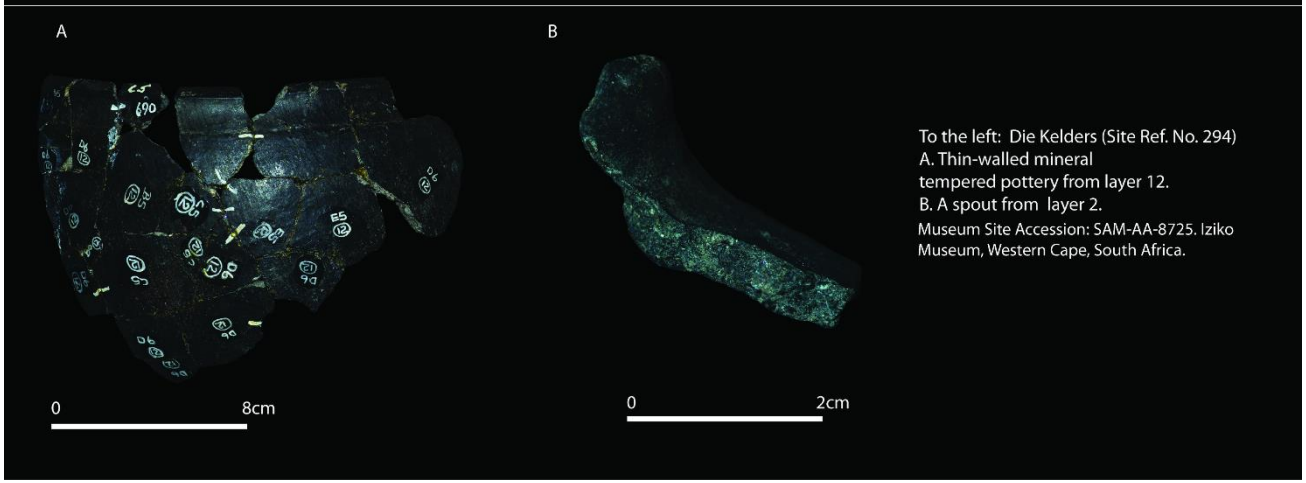


Appendix 4

4.8 S4 Appendix. Haaskraal (221) and Die Kelders (294). Examples of fibre-tempered and mineral tempered pottery, twine and ostrich eggshell photographed during museum collection visits, 2017.



Above: Haaskraal (Site Ref. No. 221). A .and B. engraved ostrich eggshell fragments and rim piece (B) from Gb 2 and F16.
C. A grass-tempered sherd from surface recovery.
D. A grass-tempered lug from levels 8 -10. Museum Site Accession: SAM-AA-9099. Iziko Museum, Western Cape, South Africa.



To the left: Die Kelders (Site Ref. No. 294)
A. Thin-walled mineral tempered pottery from layer 12.
B. A spout from layer 2.
Museum Site Accession: SAM-AA-8725. Iziko Museum, Western Cape, South Africa.