Discontinuities in hunter-gatherer prehistory in southern African drylands

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Abstract

The human history of southern Africa's drylands is a history of discontinuities. This paper identifies several instances where different kinds of discontinuity seem apparent and different kinds of approaches have been, or could be, taken to address them over the past 25,000 years (the approximate time-frame of the Later Stone Age). Fundamental to all the cases examined is a basic feature of southern Africa's geography, the distinction between summer-, winter-, and year-round-rainfall regimes that cuts across the sub-continent's arid and semi-arid zones. Drawing where possible on emerging genetic and linguistic, as well as archaeological, data the paper then discusses a series of spatial and/or temporal hiatuses in the region's cultural history from the Last Glacial Maximum to the introduction of domestic livestock. It concludes by considering two further discontinuities that underlie almost all studies of Later Stone Age hunter-gatherers and herders in southern Africa, regardless of environmental location: the relatively limited degree to which an archaeological record exists for the groups whose ethnographies are most heavily consulted, and the even more troubling disconnect arising from the extension across the whole of southern Africa of ethnographic analogies drawn from a very few populations living in its dryland biomes.

Keywords Southern Africa; discontinuities; drylands; hunter-gatherers

1. Introduction

Both theoretically and methodologically, discontinuities in the occupation of southern African drylands have not always received sufficient attention (though for counter-examples see Janette Deacon, 1974 for an important early study, and Mackay et al., 2014 for a more recent, late Pleistocene-focused assessment). Several factors encourage an emphasis on continuities in presence and behaviour through time and space. They include: the employment of a cultural systematics that divides the past into quite coarsely defined temporal blocks, the inner workings of which are left largely unexplored; an emphasis on defining archaeological entities by formal tools that are often so rare as to render inter-assemblage comparisons difficult and assemblage identifications uncertain; problems in dating many archaeological assemblages because appropriate organic materials may not survive in arid or actively eroding landscapes; the scarcity of deep, well-resolved rock shelter sequences in many areas, which only exacerbates the previous problem; and a continuing tendency to seek interpretations of archaeological data from a quite restricted anthropological sample. On the more positive side, several projects (e.g., Kinahan, 2001; Kinahan and Kinahan, 2006; Parkington et al., 1987; Sampson, 1985a; Vogelsang and Eichhorn, 2011) have explicitly favoured a large-scale, landscape-oriented approach, including the recovery of relevant palaeoenvironmental data, contract archaeology facilitates this in some areas (e.g. Orton, 2012), and at some open-air sites a lack of over-printing by subsequent occupations offers exceptionally good conditions for investigating questions about the social organisation of space (e.g. Parkington et al., 2009; Stewart et al., 2011). In addition, some dryland regions — notably the Karoo of South Africa, the Dâures (Brandberg) Massif and other mountainous areas of central Namibia, and Botswana's Tsodilo Hills — preserve rich archives of rock art (e.g. Campbell et al., 1994; Dowson, 1992; Kinahan, 1995 with references), including the oldest paintings in Africa (Wendt, 1976).

In this paper I present some ideas as to how archaeologists working in southern Africa can more fully explore questions of variation, dissonance, and diversity. I do so through a series of discontinuities touching on the demographic implications of major technological and climatic transitions, the introduction of pastoralism, and the limitations of the region's ethnographic record. For reasons of space, I emphasise the past 25,000 years, a span broadly equivalent to the Later Stone Age (LSA) of traditional nomenclature, although current drylands were certainly inhabited as early as the Acheulean (Klein, 2000) and their settlement is currently a major research focus for the succeeding Middle Stone Age (Burrough, 2016; Dewar and Stewart, 2012, 2016; Robbins et al., 2016; Vogelsang et al., 2010). Smith (1995), Lane et al. (1998), Campbell et al. (2010), Kinahan (2011), and papers in Jerardino et al. (2013) all provide more detailed overviews of individual dryland archaeologies.

2. Southern Africa and its drylands

Southern Africa is generally taken to encompass everything south of the Zambezi and Kunene Rivers. While this definition corresponds fairly well to patterning in the archaeological record (Deacon and Deacon, 1980; Mitchell, 2002), neither its internal homogeneity nor its distinctiveness should be exaggerated. For example, both the distribution of populations speaking click-using languages (Barnard, 1992) and aspects of mid-Holocene lithic assemblages (Fagan and van Noten, 1971) render attractive a more fluid boundary reaching north into Angola and Zambia. This is all the more appropriate because several dryland habitats (the Kaokoveld Desert, Namibian savanna woodlands, and Angolan mopane woodlands) extend north of the Kunene, while deep Kalahari sands reach into western Zambia, their nutrient-poor soils combining with a hot, semi-arid climate to support dry deciduous forests dominated by *Baikiaea plurijuga*.

Southern Africa's drylands are far from uniform, but at a gross level four distinct biomes can be identified (Fig. 1; Mucina and Rutherford, 2006; see also Adams et al., 1996; Cowling et al., 2004; Mendelsohn, 2002). Spanning 2000 km parallel to the Atlantic Ocean, the Desert Biome comprises rocky and gravel plains, as well as dunes and sand seas. Here in the Namib Desert, southern Africa's only truly arid region (mean annual rainfall <150 mm), rivers flow seasonally at best and vegetation is very sparse, though grasses flourish briefly after downpours. Further inland, the Nama-Karoo Biome extends across central Namibia and then south of the Orange River to encompass much of South Africa's western interior: extensive plains, interspersed with isolated hills (*kopjes*), characterise a landscape dominated by drought-tolerant grassy, dwarf shrublands supported by an annual precipitation of 100-520 mm. Westward, and reaching from !Nami≠Nūs (formerly Lüderitz) in southern Namibia to Elands Bay 200 km north of Cape Town, the drier Succulent Karoo Biome (mean annual rainfall 20-290 mm) supports many endemic succulent plants. Southern Africa's largest dryland biome, the Kalahari Savanna, covers most of Botswana and eastern Namibia, plus the north-central regions of South Africa almost to the Orange and Vaal Rivers. With only isolated pockets of topographic relief, and mostly covered by xeric grasslands interspersed with acacias and other trees, its porous, sandy soils leave it without permanent water except in the inland drainage basins of the Okavango Delta and (at times) the (potentially interlinked) Makgadikgadi, Mababe, and Ngame basins (Burrough et al., 2009).

Underpinning this variability are two basic geographical facts: the distinction between summer- and winter-rainfall regimes, and the unpredictability of precipitation in dryland environments. Encompassing much of the Fynbos Biome of the Cape and most of the South African sector of the Succulent Karoo Biome, southern Africa's southwestern corner mostly experiences precipitation in winter as cyclones repeatedly head inland from the South Atlantic. Further north, however, the frequency of winter rain diminishes in a south-west to north-east direction to the point that in southern Namibia's Diamond Area (Sperrgebiet), for example, such rain as falls may do so at almost any time, though with peaks in late summer or winter (Burke et al., 2004). Coldwater upwelling associated with the Benguela Current brings aridity to this stretch of the Namibian shoreline and northward into the Namib Desert, something only partially compensated by fog that condenses along the coast and can reach up to 90 km inland. The Kalahari, on the other hand, primarily receives rain in summer, a result of the southward migration of the Inter-Tropical Convergence Zone, though almost all the water in today's Okavango Delta (19˚S) derives from rain carried south along the Okavango River from highland Angola (~12˚S). Finally, the Nama-Karoo Biome falls within a region of year-round rainfall, though the Cape Fold Belt Mountains and Great Escarpment severely reduce the precipitation potential of weather systems moving inland.

But within all of these regions mean values mean very little because of the degree to which rainfall varies from place to place and year to year. Discussing a classic example of such variation in northwestern Botswana, Lee (1979:110) notes how in 1963-64, a time of drought, the Dobe area received no more than 239 mm of precipitation, while in the much better rains of 1967-68 as much as 597 mm fell, a difference of 250%. Emphasising the point further, at Maun, some 300 km east of Dobe, droughts (defined as times when annual rainfall is <85% of the mean) characterised 17 years (37%) out of 46, while in the Ghanzi District of western Botswana monthly rainfall varies by as much as 1000% over a distance of no more than 200 km, even though annual *totals* may be broadly comparable (Lee, 1979:112-114). As ethnographic studies amply bear out (e.g. Bollig, 2006; Lee, 1979; Silberbauer, 1981; Tanaka, 1980), to live in southern Africa's drylands requires not only a profound knowledge of their resources, but also the capacity to use that knowledge to adapt flexibly to highly, and often unpredictably, variable conditions.

In very broad terms, these patterns have probably remained constant for hundreds of thousands of years, though climate and ecology have, of course, changed over time; the significantly drier, colder, less biodiverse treeless heathland attested in the Little Karoo at the Last Glacial Maximum (LGM, 21±2 ka), for instance, is without modern analogues (Deacon and Lancaster, 1988:156). One critical factor in such changes is the location of the boundary between summer- and winter-rainfall zones, another the intensity of precipitation within them, a third the extent to which lower temperatures made such precipitation as did fall more effective. Determining past climatic and environmental conditions is less than easy, partly because of the diverse nature of available proxy records that respond to different forcing factors at different speeds (Stone, 2014). Records also vary with respect to how finely resolved they are in time and how well-dated, how continuous or discontinuous they may be, and whether — in the case of faunal or botanical assemblages accumulated by people — how much they have been affected by human choice (Chase and Meadows, 2007; Stone, 2014; Thomas and Burrough, 2012). Without attempting an overview, I draw palaeoclimatic and palaeoenvironmental reconstructions into the following discussion where helpful.

3. Discontinuities around the Last Glacial Maximum: archaeology, genetics, and linguistics

In discussing the archaeological record of southern African drylands I begin with Marine Isotope Stage 2 (ca. 25-12 ka). Relevant data are still few, though now accumulating afresh (e.g., Mackay et al., 2015) (Fig. 2). It has long seemed likely that a distinction may exist between the distributions of microlithic assemblages emphasising unretouched bladelets assigned to the Robberg Industry in and coastward of the Great Escarpment in South Africa and Lesotho and those found further north, whether flake-dominated assemblages at Apollo 11 Cave and other sites in southern Namibia (Wendt, 1972), and now also its northwest (Vogelsang and Eichhorn, 2011), or microlithic occurrences with few bladelets, but the addition of barbed bone points, in northwestern Botswana (Campbell et al., 2010). However, Robberg — or possibly Robberg — assemblages have now also been identified in areas (and in some cases contexts, i.e. open-air locations) where they were previously unknown: Namaqualand (Orton, 2008; Orton et al., 2011; Dewar and Stewart, in press), the western Free State (Palmison, 2014), and the eastern Karoo (Bousman, 2005). These sites, and other, still poorly described observations from the southern margins of the Kalahari (Beaumont, 1990; Beaumont and Vogel, 2006), show that makers of Robberg toolkits were once present in at least some of today's drylands.

But were they drylands then? The answer depends both on when such assemblages were deposited *and* to what extent southern Africa experienced changes in the intensity, seasonality, and effectiveness of its precipitation. For example, while LGM conditions were wetter than present around Elands Bay (Baxter and Meadows, 1999), arguments that the winter rainfall zone expanded far into the interior (Chase and Meadows, 2007) are inconsistent with the palaeoenvironmental records from sites like Erfkroon in the western Free State, where rainfall was reduced by 50-80% ca. 18-15.5 ka (Lyons et al., 2014), or Apollo 11, where temperate C_3 grasses did not increase significantly during the late Pleistocene (Vogel, 1983). Other data do, however, point to higher rainfall in some inland locations (e.g. Brook et al., 2010), while much further north the hydrology and biodiversity of the Kalahari's heartlands (the Makgadikgadi basin, the Okavango Delta, and the nearby Tsodilo Hills) — including a very distinct high lake level at 17±1.6 ka — probably responded more to climatic conditions in Angola than to changes in local precipitation (Burrough, 2016:163-164, 166). Though not evident at the LGM itself, wetter phases that are both earlier (MIS 3) and later (mid-Holocene) in date are associated at White Paintings Shelter, 45 km west of the Okavango River, with intensive fish procurement (Campbell et al., 2010; Robbins et al., 2016).

Summing up, there is clearly an urgent need to disaggregate the LGM, both in space and in time (Thomas and Burrough, 2012), to consider the effects on vegetation (and thus biological productivity) of not just rainfall, but also of reduced temperatures (that inhibited evapotranspiration) and lower atmospheric CO_2 concentrations, and to secure more precise chronologies for palaeoenvironmental proxies and archaeological observations alike. At Erfkroon, for example, it is clear that the Robberg occurrences analysed to date, though far from precisely constrained in age, likely represent multiple, brief occupations (Palmison, 2014). If the same is true of the other putative dryland Robberg observations noted above, then we may be looking at no more than opportunistic forays from centres of occupation elsewhere.

Genetic and linguistic evidence offer exciting new insights into the past that may help identify such centres. The linguistic prehistory of southern Africa is extremely complex, particularly as regards the click languages conventionally lumped together under the label ‘Khoisan’. However, any such homogenisation is deeply flawed (Crawhall, 2006; Güldemann and Stoneking, 2008), and at least three distinct language families must be identified: Khoe (almost certainly a relatively recent, i.e., late Holocene, intrusion into southern Africa; see below); Kx’a, focused on the northern Kalahari (but including ≠Hoã further south), and Tuu, known principally from South Africa and Lesotho (Güldemann, 2008). While many of the languages once spoken by southern African hunter-gatherers have disappeared without trace, the Kx’a/Tuu divide likely possesses considerable antiquity. Moreover, recent genomic data identify a longstanding separation between northwestern and southern/southeastern Bushman groups within the Kalahari that originated <30,000 years ago (Pickrell et al., 2012; Schlebusch et al., 2012) but was followed by more recent contact (Barbieri et al., 2014).

While the difficulties of placing reliable temporal constraints on genetic and linguistic data and successfully relating them to archaeological phenomena are well known, could episodes of hyper-aridity have disrupted flows of genes and information between populations in the northern and southern halves of southern Africa to produce the differentiation evident across all three datasets? Such episodes may be signalled by recurrent episodes of dune activity in the Kalahari in the millennia immediately before and around the LGM (Thomas and Burrough, 2012). In addition, the extensive (±66,000 km^2) Megalake Makgadikgadi may also have hindered contact between northwestern and southeastern populations when full (Barbieri et al., 2014), such as during its post-LGM transgression 17±1.6 ka, something also evident in other Kalahari basins (Burrough et al., 2009). Both possibilities raise important questions: under what conditions do people choose *not* to invest in maintaining long-distance exchange flows? And how (and at what spatio-temporal scales) can we model the boundaries of such networks to account for instances of regional demographic and cultural coalescence within broader processes of population fragmentation (Mackay et al., 2014)?

4. Explaining technological transitions: cultural systematics and radiocarbon dates

The systematics underpinning southern Africa’s Stone Age culture history have recently been revised by Lombard et al. (2012), who define six different technocomplexes for the past 20,000 radiocarbon years. The Robberg is one of these. Lombard et al. (2012:124) rightly recognise that within any particular technocomplex individual industries will vary, but that "all share a widely diffused and interlinked response to common factors in the social and physical environment, economy and technology". Such variation may be both temporal and spatial, reflecting changes in raw materials, activities, and style. In reality, however, most such patterning remains informally defined at best and there have been few attempts over the past generation to explore the degree of spatio-temporal coherence lying behind any of these larger entities. Janette Deacon's (1972) sub-division of the mid/late Holocene sequence at the Wilton type-site into four successive phases, and the efforts of Aron Mazel (1989) to distinguish and interpret 'social regions' in the material record of KwaZulu-Natal's Thukela Basin, are among the few exceptions, but neither comes from a dryland context.

The terms 'Robberg', 'Oakhurst', and 'Wilton' thus remain catch-all categories analogous to the Neolithic/Bronze Age/Iron Age trilogy of later European prehistory; archaeologists find them useful as monikers that imply widely shared, and easily grasped, associations of technology, age, and subsistence/palaeoclimatic associations, but their inner workings are left largely unexplored, with change typically expressed as abrupt transitions between otherwise static blocks (Orton, 2014; cf. Shea, 2014). Almost entirely absent are organisationally or behaviourally informed analyses of how precisely stone tools were produced, used, and discarded (cf. Nelson, 1991). While such work is now beginning (e.g., Pargeter and Redondo, 2016), it will be some time before it becomes possible to use the *details* of lithic production to distinguish different temporal variants within an individual technocomplex, or, for example, to recognise as Robberg an assemblage that for situationally specific reasons lacks the many bladelets and bladelet cores that conventionally define that entity. Partly because of such issues, archaeologists still struggle to integrate the thousands of open-air sites found across southern Africa's interior (almost always without dateable organics) with observations from the smaller numbers of stratigraphically defined sequences that almost always come from rockshelter contexts. This discontinuity in the nature of our archaeological resources makes it frustratingly difficult to construct detailed narratives of how and when some regional landscapes were used.

More broadly, lithic technologies and the behaviours to which they relate can be contextualised within broader frameworks of ecological variation, landscape exploitation, and dietary choice. This may be particularly helpful for understanding some of the key discontinuities marking southern Africa's hunter-gatherer record. Here, I briefly elaborate on two, both with major implications for the peopling of some of southern African drylands: the shift from Robberg (or late Pleistocene microlithic; J. Deacon, 1984) to Oakhurst (non-microlithic) assemblages close to the onset of the Pleistocene/Holocene transition, and the subsequent replacement of the Oakhurst itself by a new, and different, suite of Wilton (Holocene microlithic) occurrences.

In very general terms, Oakhurst assemblages (ca. 12,000-7000 uncal. BP) are flake-based and non-microlithic, lack bladelets and the various kinds of specialised cores used to produce them, and are characterised by relatively few formally retouched tools, usually scrapers; in some regions a clear preference for more coarsely grained rocks occurring in larger preforms (e.g., quartzite, hornfels) is also apparent. Additionally, in areas as distant from each other as highland Lesotho and the Fynbos Biome of the southwestern Cape distinctive scrapers characterised by steep, lateral retouch occur after 9500 uncal. BP (J. Deacon, 1984). The Oakhurst technocomplex differs from its Robberg predecessor in at least two important respects: first, in having abandoned its longstanding emphasis on bladelet production, and second, in being geographically much more extensive. Neither phenomenon is well understood, but both speak to major discontinuities in the practice, and in the presence, of hunter-gatherer populations.

Taking the geographical dimension of what we might call the 'Oakhurst problem' first, we confront at least two developments (Fig. 3). One concerns the apparent resettlement of the central interior of southernmost Africa, specifically the Karoo and adjacent regions of the Free State and Northern Cape, where many hundreds of open-air sites assigned to the Lockshoek variant of the Oakhurst are known (e.g., Sampson, 1985a). We are surely looking here at an increased human presence, perhaps one signalled by a marked expansion in the L0d1b mtDNA sub-haplogroup after 12 ka (Schlebusch et al., 2013). But when, from where, and how did people execute this movement? Was it a continuously unfolding process or a much more staggered one? If an external origin is to be sought, then populations in the topographically more diverse, better-watered Cape Fold Belt and Great Escarpment are an obvious source, encouraged by demographic pressures resulting from loss of previously exposed coastal plains as sea-levels rose (Fisher et al., 2010), something perhaps foreshadowed by the much intensified Robberg occupation signal already evident in many areas 14-12,000 uncal. BP (Compton, 2011:18). However, the almost total lack of organic materials at Lockshoek sites and the equally almost complete absence of Lockshoek assemblages from stratified rockshelter contexts makes determining their age extremely difficult. Nevertheless, since palaeoenvironmental proxies are increasingly signalling that the Pleistocene/Holocene transition was far more complex and less unidirectional than once thought (e.g., Roberts et al., 2013; cf. Coetzee, 1967) we should surely expect that (re)settlement of the Karoo and other drylands took account of such variability, even if, in general terms, the period 12-8000 uncal. BP saw rainfall, temperature, and ecological productivity increase across the sub-continent as a whole.

Perhaps related to this is the fact that with the Oakhurst we do not merely see populations moving into areas that were previously uninhabited, or at least settled below the level of archaeological visibility, but also an actual expansion of people's social networks to draw in areas that had not previously shared in the same technological traditions, something also visible in increased numbers of items of personal decoration and potential exchange, such as beads (Mitchell, 2002:155-157). The southern, central, and northwestern regions of Namibia (Shackley, 1984, 1985; Vogelsang and Eichhorn, 2011; Wendt, 1972) and southwestern Zimbabwe's Matopo Hills (Walker, 1995a) all exemplify this. That people living in these localities (though not Botswana; Walker, 1998:75) now produced artefacts of a kind recognisably similar to those made and employed in South Africa and Lesotho suggests a common understanding of how best to deploy technology to secure food and other resources that we have still to explain. Interrogating this further, the Australian concept of drylands as 'spread zones', periodically unified and homogenised by the spread of cultural/technological/linguistic traits from more densely occupied margins, may prove attractive (cf. Smith, 2013:209-210).

The second component of the 'Oakhurst problem', the abandonment of the Robberg's emphasis on producing unretouched bladelets, is mirrored at the other end of the Oakhurst's trajectory by its own replacement by another microlithic toolkit, the Wilton, which employed not unmodified bladelets, but tightly standardised, formally retouched backed microliths and scrapers. Both transitions require more detailed investigation, including experimental work, since even the precise uses of many of the artefacts involved is uncertain: were, for example, segments, the archetypal Wilton *fossile directeur*, employed principally to tip arrows or more generally to form the cutting edge of a range of tools (Wadley and Binneman, 1995; cf. Wadley and Mohapi, 2008)?

One suggestion is that the Wilton's emphasis on greater formality and more frequent production of items of personal decoration like ostrich eggshell beads signifies a profound change in how people viewed the world around them (Humphreys and Thackeray, 1983:291). Janette Deacon (1984) expressed similar thoughts when she interpreted the Robberg/Oakhurst and Oakhurst/Wilton transitions not in directly functional terms, but — using ideas from Deetz's (1977) exploration of 'deep structure' in early colonial New England — as signals of the 'social stress' experienced when adapting to changing environmental conditions. While stone tools undoubtedly embody more than purely functional information or choices susceptible to modelling in behavioural terms, I am unsure that either interpretation readily lends itself to evaluation, though stress might be modelled from climatic data in terms of increasing subsistence risks or, were sufficient human skeletons available, identified from signs of increased violence or nutritional deficiencies.

More susceptible to investigation, I suspect, are arguments focusing on the potential advantages of miniaturisation and standardisation as strategies for enhancing the maintainability and/or reliability (*sensu* Bleed, 1986) of tools and weapons. In the eastern Karoo, Bousman (2005) has argued that changes in raw material usage, stone reduction, bladelet and backed microlith production, and scraper resharpening can profitably be understood from the perspective of how lithic technologies can minimise risk in repairing and replacing tools, and by extension securing food, in the face of fluctuating environmental conditions. To the northeast and in less detailed fashion I have speculated that Wilton toolkits were adopted in the Caledon Valley during a significantly drier and cooler episode that was likewise met by economising behaviour in stone reduction (including increased use of bipolar flaking) and dietary broadening (Mitchell, 2000), and other studies examine late Holocene usage of blade and bladelet technology in the Northern Cape (Lombard and Parsons, 2008; Parsons, 2011). More generally, Hiscock et al. (2011) note that backed microlith production was associated with periods of significant climatic change in Australia and South Asia, reinforcing the attractiveness of exploring this possibility — and risk-minimisation strategies in general — in the southern African case by combining technological analyses with usewear and residue analyses (cf. Attenbrow et al., 2009). Because of their potentially greater marginality for sustaining human settlement, drylands make particularly good candidates for exploring such ideas.

Crucial to any explanation of the technological transitions leading into and out of the Oakhurst technocomplex must be a firm grasp of their timing, including certainty that when distinctions are drawn between assemblages contrasts are not enhanced by the discontinuous nature of the very sequences in which they are found (Sampson, 1985b). Only then can we gain effective purchase on how far either transition did, or did not, match any particular climatic episode, or how time-transgressive it was across southern Africa as a whole, and its drylands in particular. How far, for example, does the suggestion made by Janette Deacon (1984) over 30 years ago that the Wilton's formal microlithic technology was taken up across the sub-continent in a north-to-south direction and, within South Africa itself, along an east-to-west cline still hold up? Can we trust dates that suggest a late survival of Oakhurst assemblages in the Karoo (Beaumont and Vogel, 1989; Horowitz et al., 1978) and northwestern Namibia (Vogelsang and Eichhorn, 2011) and what might be gained from comparing such distant contexts? What were the effects on human populations of relatively short-lived environmental changes (like the 8.5 ka re-emergence of the Makgadikgadi megalake; Burrough et al., 2009) as opposed to more persistent long-term trends (e.g. mid-Holocene aridity in Namaqualand, where low rainfall, compounded by reduced fog production, seems to have severely constrained settlement; Dewar and Orton, 2013; Weldeab et al., 2013)? And what lead to some areas being eventually resettled after long lapses in (archaeologically visible) occupation that in central Namibia's Dâures Massif and Erongo Mountains, for example, lasted from some time in the Middle Stone Age to after 6000 BP, i.e. upward of 20,000 years (Vogelsang and Wendt, 2007)?

Experience elsewhere in the world demonstrates the value of having comprehensive sets of radiometric dates for tackling questions of this kind (e.g., Bueno et al., 2013; Méndez et al., 2015; Williams et al., 2014), but southern Africa as a whole still lacks a comparable resource. This now severely handicaps archaeologists' ability to tackle questions of discontinuity in human presence on regional landscapes, of populations' resilience and adaptability to changing ecological circumstances, or simply of the reliability of the available dates themselves. On a local level, lists of dates occasionally surface in peer-reviewed literature or graduate theses (e.g., Orton, 2012), or form the basis of assessments of regional archaeological records (e.g. Vogelsang and Wendt, 2007). However, only rarely do they provide the information needed to screen them for their chronological hygiene (cf. Fitzpatrick, 2006), a necessary precondition for using them to explore past population histories or to identify undated gaps within known sequences (or unexplored lacunae on maps) that might warrant further investigation; Sadr and Sampson's (2006) assessment of dates for early pottery is a rare exception.

Construction of a detailed, searchable, up-to-date and readily accessible database of radiocarbon (and other radiometric) dates for southern Africa's drylands is a *sine qua non* for serious work on their long-term demographic history. Moreover, in due course more intensive dating of archaeological sequences and calibration into calendar years of those dates we already have should bring two additional benefits: a sounder appreciation of the precise timescales to which our data refer and the time-spans over which our explanatory efforts should be pitched, and an improved ability to investigate behavioural variability without recourse to cultural labels that presume we already know what we are seeking to find out, the NASTIES ('named stone tool industries') recently critiqued by John Shea (2014; cf. Inskeep, 1967:571). As a corollary, learning to make sense of multiple, better dated, smaller samples and the fine detail of their stratigraphic associations will also surely help produce a southern African prehistory written on a more human timescale and with greater attention to questions that are both social *and* environmental in nature, rather than one that is ultimately an exercise in typology and subsumes change into large, coarsely grained, behaviourally impenetrable analytical units (Parkington, 1993). Drawing these themes together, Kinahan (2016) has recently explored a dataset of 135 archaeological radiocarbon dates from the Namib Desert against local and regional proxy palaeoenvironmental evidence. His demonstration of how people were able to occupy the Namib continuously over the past millennium by using specific technologies and practices (e.g. seed storage in pots; livestock loans; conversion through exchange of surplus animals into copper beads and other goods redeemable for livestock at a future date) and by practising a flexible pattern of aggregation and dispersal that complemented exploitation of favoured resource areas with opportunistic use of secondary, ephemeral resources elegantly illustrates how such databases can be employed.

5. Introducing herding: continuities and discontinuities between 'Khoe' and 'San'

The broadly north-to-south trend across southern Africa in the adoption/innovation of the Wilton toolkit during the early and middle Holocene has been seen by some (e.g., Ehret, 2002:95) as signalling a population movement into the sub-continent from East Africa. In fact, no convincing evidence exists for connecting the two regions' archaeological records in this way, or for a single Khoe-San language family that embraces all the click-using languages of both East and southern Africa, including Hadzane in northern Tanzania (Crawhall, 2006; Sands, 1998).

Positing connections between archaeological, linguistic, and genetic data requires us to be sensitive to differences in how samples are acquired, how large and reliable they may be, and how credible and tightly constrained are the chronologies that they employ. Such limitations have not always been properly appreciated (e.g. Crawhall, 2006 with reference to glottochronology and Mitchell, 2010 with respect to many earlier genetic studies; and see MacEachern, 2000 for a classic statement of the same at a pan-African scale). Surprisingly, then, there is now increasingly good correspondence between archaeological, linguistic, and genetic data for some kind of demographic move from East Africa into southern Africa having taken place not long before 2000 uncal. BP. This draws together several observations: the undeniably northern origin required for the sheep (and — slightly later? — cattle) that appeared in southern Africa's drylands in the last centuries BC/first centuries AD; genetic studies documenting the presence in southern African Khoe-speaking populations of a distinctively East African-derived allele (C-14010) that codes for lactase persistence and thus allows adult to digest fresh milk (Breton et al., 2014; Macholdt et al., 2014; Ranciaro et al., 2014); other genetic analyses documenting the presence in the same populations of additional East African markers in Y-chromosome, mtDNA, and autosomal variation (Barbieri et al., 2014; Henn et al., 2008; Schlebusch et al., 2012); and the likelihood of a genealogical connection between Khoe and Sandawe, a second East African click-using language (Güldemann, 2008:112).

Precisely what form such movement took — and how far and how extensively livestock spread with people or because they were exchanged to hunter-gatherers living beyond the frontier of herder expansion — is debated (Orton, 2015). One area that clearly merits further research is the palaeoenvironmental context in which such movements and exchanges took place: livestock (and herders?) spread south during the last centuries BC when the late Holocene neoglacial produced conditions cooler and moister than present (Avery, 1992), but the precise timing of their expansion vis-à-vis a widespread drought *c.* 2 ka in the summer-rainfall zone, Namibia, and Namaqualand remains to be established (Scott et al., 2012), even though the latter's possible linkage to more frequent El Niño events usefully reminds us of the value of situating southern African history within a global environmental context.

A migratory movement into at least northern southern Africa during the first millennium BC presumably derived ultimately from the Pastoral Neolithic communities who were already well established in East Africa by this time (Lane, 2013). As Fig. 4 shows, newly arriving Proto-Khoe-speaking groups seem to have interposed themselves between speakers of Kx'a languages, represented today principally by !Kung and !Xūu in the northern Kalahari and ≠Hoã in its south. But this masks another important discontinuity, the fact that many of those Khoe-speakers (including such 'classic' case-studies as the Nharo (Guenther, 1986) and the G/wi (Silberbauer, 1981)) are not, in fact, herders, but in their subsistence practices, cosmology, and social organisation clearly 'Bushman' hunter-gatherers similar to the Kx'a- and Tuu-speakers around them (Barnard, 1992). Genetic analyses confirm this (Barbieri et al., 2014; Schlebusch et al., 2013). Language shifts in favour of Khoe are, however, likely to have been complex, sometimes involving loss of livestock-keeping by immigrant herders or the adoption of grain cultivation, as well as differential degrees of intermarriage with aboriginal foragers, speakers of Bantu languages, and people possessing more negroid phenotypes. Such complexities seem particularly evident in the ancestries of Namibia's Damara and of the River Bushmen of Botswana's Okavango Delta and Boteti River (Barnard, 1992; Güldemann, 2008; Haacke, 2008; Pickrell et al., 2012). Collectively, they emphasise the dynamism that lurks behind the Kalahari's 'ethnographic present' (Reid 2005).

6. Taking the Kalahari debate beyond the Kalahari

The introduction of livestock and the fact that many 'Bushmen' speak Khoe, rather than Kx'a or Tuu languages with much deeper local roots, are not the only significant discontinuities of the past 2000 years. Across southern Africa's eastern half (and into its far northwestern fringes) this period also saw the expansion of iron-using Bantu-speaking groups who combined herding with cereal and legume cultivation in a mixed agropastoralist economy. These Farming (or Iron Age) Communities began settling in Zimbabwe and along the Indian Ocean coast in the early centuries AD and by the end of the first millennium were present across much of the sub-continent east and north of the 500 mm isohyet, expanding later into the Grassland Biome of the south-central interior, though only ephemerally or marginally occupying southern Africa's drylands, principally along the northern, eastern, and southeastern borders of the Kalahari (Huffman, 2007). This is because their staple crops — sorghum (*Sorghum bicolor*) and pearl millet (*Pennisetum glaucum*) — require a mean annual precipitation of ≥500 mm (with ≥350 mm during the growing season) and a specifically summer-rainfall regime (Huffman, 1996). Rainfall, then, has drawn a pronounced discontinuity across southern Africa's history over the past two millennia, notwithstanding fluctuations in scale or seasonality that, for example, briefly permitted eighteenth-century Tswana-speakers to settle in parts of South Africa's Northern Cape Province that today receive just 250 mm of rain per year (Humphreys, 1988), or allowed Early Farming Communities to live in the Tsodilo Hills, an area they abandoned early in the second millennium AD (Denbow, 2011).

If southern Africa's drylands therefore remained largely the preserve of Khoe-, Kx'a- and Tuu-speaking herders and hunter-gatherers, the history of hunter-gatherers in those regions that Farming Communities did successfully colonise was one of large-scale assimilation, to the point of leaving limited cultural, linguistic, or genetic traces among most of today's Bantu-speaking populations. As a result, southern African archaeologists confront two major challenges. On the one hand, surviving Bushman groups must descend from communities likely to have been aware of and in some kind of contact with food-producing societies for many centuries, making us ask how much of their way of life was altered as a result. On the other, almost all those Bushman groups that survived long enough to be ethnographically documented did so in arid or semi-arid environments that are *prima facie* not representative of southern Africa as a whole. How far, then, can we reliably employ their ethnography to illuminate and interpret hunter-gatherers who lived in quite different ecological contexts?

The first of these questions goes to the heart of the Kalahari Debate of the 1990s (Guenther, 1996; Silberbauer, 1991; Solway and Lee, 1990; Wilmsen, 1989; Wilmsen and Denbow, 1990). Space does not permit extended rehearsal of those discussions here. Suffice it to say that the archaeological record for the Kalahari *as a whole* does not support the widespread subordination of Bushman groups (Sadr, 1997), even though some foragers undoubtedly were incorporated socially, economically, and biologically into agropastoralist communities (Denbow, 1999). Instead, the broad sweep of ethnographic evidence shows that many Kalahari Bushmen, including the Ju/'hoãnsi, G/wi, and Nharo, maintained well into the twentieth century economies grounded principally on hunting and gathering wild, undomesticated plants and animals, social systems founded on distinctive systems of kinship reckoning, gift-exchange, and gender relations, and cosmologies privileging shamanic entrance into altered states of consciousness in which ancestor veneration and fear of witchcraft found no part: in other words, economic, social, and belief systems recognisably distinct from those of their Bantu-speaking neighbours (Kent, 1992).

But an absence of political domination or economic incorporation does not mean a lack of change or influence, still less that societies remain unaltered even without the stimulus of new ideas and technologies from others (Hitchcock, this volume). Ethnographically described Kalahari Bushmen have clearly not been preserved in aspic from some pre-contact Edenic state, and while divination and some other ritual borrowings may be relatively trivial (Guenther, 1996:73), other acquisitions were presumably more important. Iron, for instance, enhanced the effectiveness of some tools and reduced the time needed for some tasks (Lee, 1979:277), while dogs made killing many game animals significantly easier (Mitchell, 2008). The precise impacts of such novelties is not, however, the point I wish to develop. Rather, it is to note something that has still not received sufficient attention — the Kalahari Debate is simply too important to be left to the Kalahari.

For if Kalahari hunter-gatherers have a history, including a history of interaction with herders as well as agropastoralists, then that history surely needs to be taken into account before ethnographies of twentieth-century AD age are mined for insights into hunter-gatherer communities of the twentieth-century or twentieth-millennium BC. In all the discussion of the late 1980s and since surrounding the deployment of ideas of seasonal aggregation and dispersal, gift-exchange practices, gender, and other social phenomena I see little sign of this having been done (though see Barham, 1992). To be sure, the Kalahari debate finds echoes in the Maloti-Drakensberg Mountains of southeastern southern Africa, a region crucial to understanding Bushman rock art, where potential agropastoralist influences on hunter-gatherer cosmology and paintings have provoked intense discussion (Hammond-Tooke, 1998; Jolly, 1995, 2006) and where broader changes in technology, economy, and ritual practice are clearly evident, both over the longer term (Mitchell, 2009) and within the narrower confines of the nineteenth century (Challis, 2012). It also resonates in still unresolved exchanges over the ethnic identity and subsistence practices of precolonial populations in western South Africa: hunter-gatherers, herders, or hunters-with-sheep, Khoe, San, or eternally cycling between the two (see Orton, 2015 for a review; Russell and Landers, 2015 for a discussion of archaeologists' use of ethnographic data when modelling precolonial pastoralist societies). However, the general principle that ethnographic observations come with a history that requires analysis before we extend them analogically across time and space has still not been fully confronted.

We cannot, for example, simply assume that because Ju/'hoãnsi engaged in a particular form of reciprocal gift-exchange (*hxaro*) when observed to do so in the 1950s and 1960s they have always done so, nor that we can then uncritically apply such analogies to the broader southern African archaeological record regardless of time and place. Initial enthusiasm for doing this in the case of *hxaro* did indeed productively connect multiple lines of analysis (exchange, demographic and social reproduction, insurance against resource failure, egalitarianism; Mazel, 1989; Wadley, 1987), but it depended on assumptions about the presumed material proxies of its preferred exchange items — beads and arrows — without ever really checking if those same items had moved anywhere at all, or if their presence/absence at archaeological sites might have other explanations (Mitchell, 2003). The fact, as Larry Barham (1992) points out, that we have virtually no data to connect ethnographically recorded Bushmen to stone tools and even fewer regarding their use of rockshelters, two of the major datasets on which archaeologists rely, underlines the danger of ignoring the specific temporal contexts of the ethnographies that we employ.

The temptation to apply the last 150 years of ethnographic observations to the whole of southern Africa's hunter-gatherer past without appropriate historical contextualisation is thus one into which we should not be led, attractive as it is for vivifying the stones, bones, and other things that we uncover in order to make statements about social change. Beyond this, archaeologists also need to consider how intensely partial their use of ethnography is, for explorations of technology, subsistence, social relations, and world view only seldom move beyond three well-known and well documented groups: the now extinct /Xam of South Africa's Karoo, the Ju/'hoãnsi of the northwestern Kalahari, and the G/wi of its arid heart. Though these ethnographies unquestionably enrich archaeological understandings, at least 20 more Bushman groups are still extant. Rarely, if at all, however, do archaeologists call upon the !Xõ, the Hietshware, or the Shua (Barnard, 1992), consider variability within, as well as between, the groups whom they cite (cf. Hitchcock, this volume), or recall that the /Xam, Ju/'hoãnsi, and G/wi come from just two of southern Africa's biomes, the Kalahari Savanna and the Nama-Karoo. The hunter-gatherers who once lived in the others, which include Mediterranean-like *fynbos* environments, highland grasslands, evergreen forest, and a variety of better-watered woodland savannas, have no ethnographic record worthy of the name. If people even partly structure their behaviour along ecological grains (Binford, 2001; Kelly, 2013), then a lot is clearly being missed by only employing Kalahari and Karoo ethnographies (Pargeter, 2014). Except perhaps for rock art, where careful cross-referencing between ethnographies and between them and the empirical record is the norm (e.g., Lewis-Williams, 2015), southern African archaeologists risk binding all precolonial hunter-gatherers by laws in which they have little or no representation. Conversely, with few exceptions (Beaumont and Vogel, 1989; J. Deacon, 1996; the work of Larry Robbins and colleagues summarised in Campbell et al., 2010; and the study by Peters et al., 2009 of Hai//om animal exploitation in Namibia's Etosha region), the pasts of the /Xam and of surviving Bushman communities still lack sustained archaeological exploration (Walker, 1995b). As Ann Stahl (2001) has shown in the very different context of rural Ghana, African archaeology as a whole needs more emphasis on working back from the historical/ethnographic 'present' to pinpoint when, where, and how ethnographically recognisable behaviours first appeared, thereby identifying discontinuities in their practice; southern African drylands need not be an exception.

7. Moving forward, going backward: overcoming the Middle/Later Stone Age divide

The danger of extending our ethnographies from Fernand Braudel's *évenements*, the relatively short-term observations of professional anthropologists working with living communities, to his *longue durée* is nowhere more evident than in recent efforts to locate the origins of 'San culture' deep in the Upper Pleistocene (d'Errico et al., 2012; Villa et al., 2012). Although these particular papers relate to a 'Later Stone Age' assemblage of ±38 ka from the South African site of Border Cave, they are matched by a growing body of southern African data from Middle Stone Age (MSA) contexts (Wadley, 2015) that provides some of the oldest evidence in the world for shell jewellery, formally designed bone tools, paint, complex, hafted technologies, the bow-and-arrow, and other behaviours with parallels in the ethnographic record. Attempts to apply such parallels in the MSA have already been made (H. Deacon, 1989; Lewis-Williams and Pearce, 2004), and more will surely follow, but extrapolating Bushman ethnography back into the Pleistocene, or identifying something there that is recognisably 'San', ignores both the multiple, and major, climatic and environmental shifts of the past 100,000 years and the fact that today's Bushmen have rich histories of their own making and agency (Pargeter, 2014; Pargeter et al., 2016). Neither the academic nor the political implications of such stasis are appealing (cf. Daley, 1996, citing Botswana's then president, Festus Mogae).

Instead, across all regions of the sub-continent, the time is long overdue to heed John Parkington's (1984) call to 'de-!Kung' southern African prehistory by situating its hunter-gatherers within an explicitly global and behaviourally oriented context. While it would be absurd to expect this to enhance all understandings (Inuit mythology is unlikely to explain the specifics of Bushman beliefs or rock art, for instance), mobility and group size, dispersal and aggregation, diet breadth and content, technology, exchange, land tenure, egalitarianism, and storage do show patterning in relation to ecological variables (Binford, 2001; Kelly, 2013). By exploring that patterning and thus opening themselves up more to hunter-gatherer research in other parts of the world, including other southern hemisphere drylands (Veth et al., 2005), southern African archaeologists may transcend some of the limitations that inevitably flow from depending on Kalahari/Karoo-focused, late nineteenth/twentieth-century ethnographies. As one example, consider the patterned variation between resource predictability, social boundary defence, shared access to resources, and exchange discussed by Cashdan (1983, 1984) and Humphreys (2007) that draws on much broader theoretical premises (e.g. Dyson-Hudson and Smith, 1978). As another, note how recent papers in *non-dryland* areas of southern Africa argue that past hunter-gatherers in environments as diverse as the Forest Biome of the southern Cape (Sealy, 2006), the Fynbos and Thicket Biomes of the Eastern Cape Province (Hall, 2000), and the Maloti-Drakensberg Mountains of Lesotho (Stewart and Mitchell, in press) behaved in ways markedly divergent from those observed ethnographically in the Kalahari, whether by maintaining much more sedentary, bounded patterns of settlement or by intensifying their exploitation of a range of aquatic (freshwater or marine) resources.

Placing the archaeology of southern African hunter-gatherers within an explicitly comparative behavioural context may also overcome the increasingly unhelpful bisection of the late Quaternary archaeological record into distinct MSA and LSA phenomena that has roots in patently flawed associations with different human types (archaic v. modern; Goodwin and van Riet Lowe, 1929), perpetuates the use of different lithic typologies and analytical methodologies that obscure comparisons between them (Clark, 1997), and renders the *long-term* study of variation in hunter-gatherer behaviour unnecessarily difficult; beyond Ambrose and Lorenz's (1990) pioneering paper, the absence of studies comparing processes of toolkit miniaturisation in the Howiesons Poort with those in the Robberg or Wilton is, for example, striking (though see now Sealy 2016). At the same time, constructively engaging with genetics (including ancient DNA; Morris et al., 2014) and linguistics while critically interrogating the basis of their samples and chronologies, building essential investigative tools such as comprehensive databases of radiocarbon dates, being critically aware that ethnographic data are a product of specific histories, researching interaction between socially and economically different groups (e.g., hunters and herders), paying greater attention to cultural and palaeoenvironmental variability, and developing more effective means of dating rock art so that it can be integrated with the broader archaeological record (cf. Bonneau et al., in press) should offer additional means of exploring continuities and discontinuities in southern Africa's drylands.

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Fig. 2. Southern Africa: archaeological sites dated to MIS 2. Sites lying within the region's current dryland biomes are named as follows: AK AK2006/001G; AP Apollo 11 Cave; DC Depression Cave; DIK Dikbosch; EQ Equus Cave; ERF Erfkroon; GOB Gobabeb; KAT Kathu; KWI Kwihabe; NOS Nos; OM Omungunda 99/1; OV Ovizorombuku 98/6; POC Pockenbank 1; RS Reception Shelter; SPK Spitzkloof A; WPS White Painting Shelter.

Fig. 3. Southern Africa: archaeological sites producing assemblages assigned to the Oakhurst complex (Lombard et al., 2012) and the generalised distribution of its Lockshoek Industry variant.

Fig. 4. Southern Africa: generalised distribution of speakers of the Khoe-Kwadi, Kx'a, and Tuu language families and associated subsistence strategy (hunting and gathering; herding) and biological affiliation (Khoisan; non-Khoisan) (after Güldemann, 2008: Fig. 1).

*Figure

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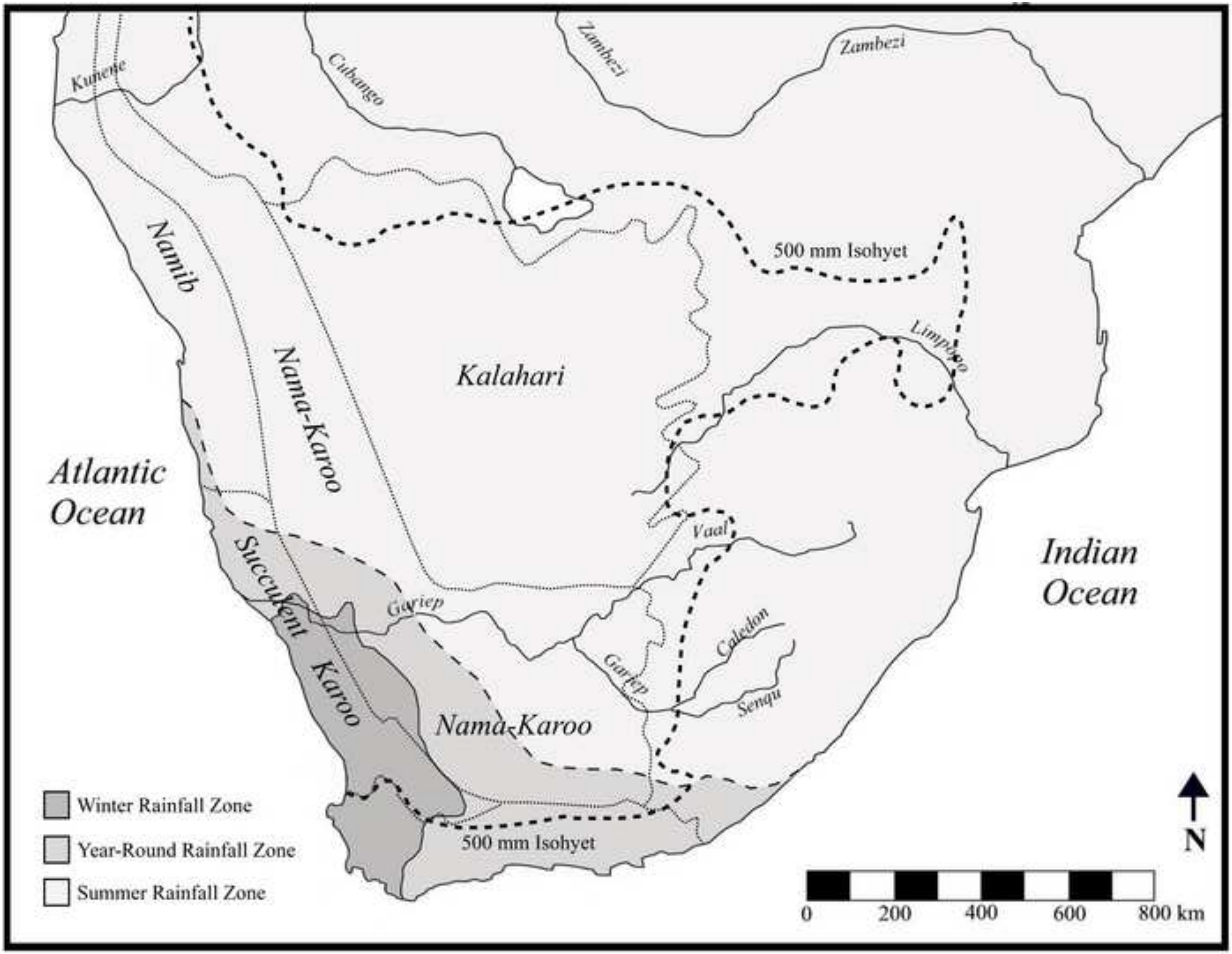

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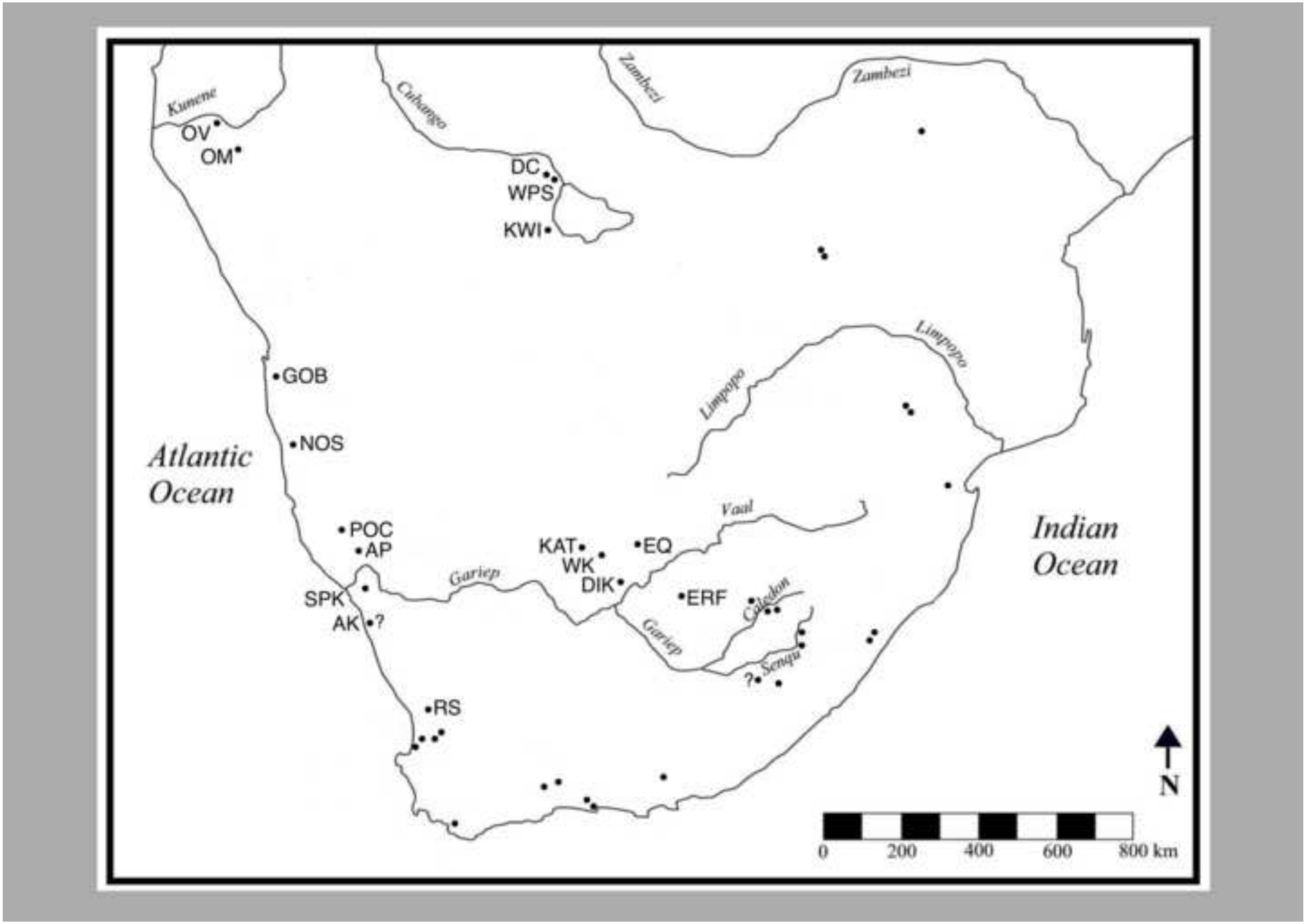

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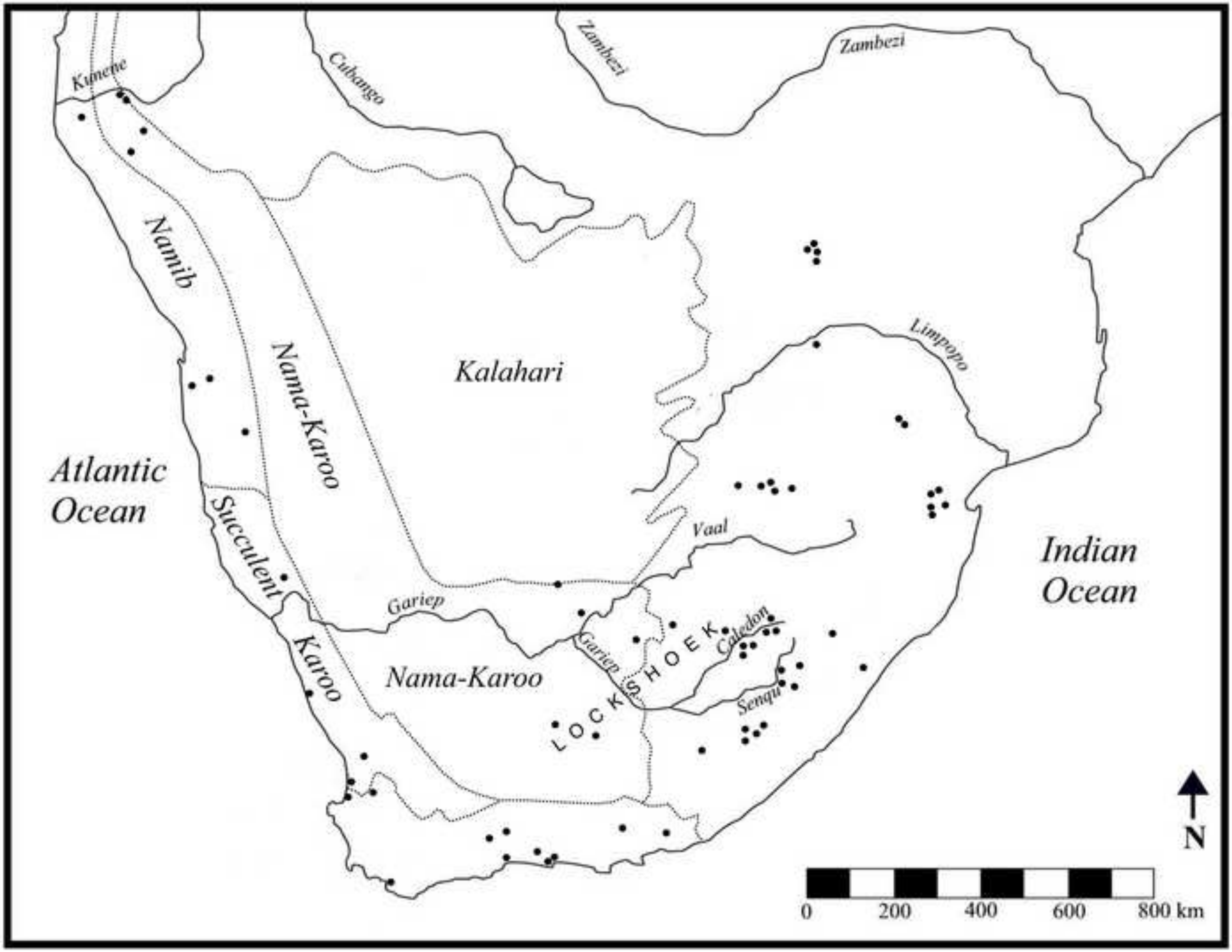

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