Afr Archaeol Rev (2016) 33:345–351
DOI 10.1007/s10437-016-9237-8

INTRODUCTION

New Directions in South African Archaeozoology of the Last 2,000 Years

Annie R. Antonites · Karin Scott · Evin Grody

Published online: 4 November 2016

Introduction

Archaeozoology (or zooarchaeology) is one of the most dynamic fields in archaeology—constantly expanding the ways in which we consider the diverse range of past human and animal interactions. Archaeozoological questions have evolved in tandem with anthropological considerations of animals, from the nutritional focus and behavioural-ecological perspectives that characterised the field in the 1970s and 1980s, to more recent trends focussing on the social impact of animals on society (see Russell 2012; Sykes 2014 for overviews; see also Twiss 2012). This theoretical diversity underpins the wide spectrum of questions that the study of faunal remains can address. As such, archaeozoology is well positioned to contribute to themes related to human-environment interactions and societal complexity, as well as movement, mobility and migration—recently identified as some of the key global archaeological research themes for the future (Kintigh et al. 2014; cf. Steele 2015).

The increased thematic scope is due in part to expanded interdisciplinary efforts, new technologies, and methodological advances. Today, the field is shifting towards better integrating research designs and results with other archaeological datasets (e.g., Hamilton and Thomas 2012; Maltby 2006; VanDerwarker and Peres 2010). Computer technology now enables incorporation, comparison and quantitative analysis of large faunal datasets on a scale not possible before (e.g., Arbuckle et al. 2014; Orton et al. 2014). Methodological advances—such as the development of Zooarchaeology by Mass Spectrometry or ZooMS (Buckley et al. 2009) and use-wear analysis (Évora 2015)—are helping archaeozoologists to break through the confines of macroscopic examination. These, and other developments (e.g., Steele 2015), are driving the future of archaeozoological research in global context.

Given the current theoretical and methodological trends in archaeozoology worldwide, coupled with the active study of past human-animal interactions in the South African region, we organised a session at the 2015 "Association of Southern African Professional Archaeologists" (ASAPA) conference in Harare, Zimbabwe, entitled "New directions in the archaeozoology of the last 2,000 years." The aim of the session was twofold: first, to consider the contributions that southern African faunal studies can make to broader archaeological questions, and second, to highlight the field's multidisciplinary and interdisciplinary potential to provide complementary research directions to "traditional" methodologies. Only case studies related to South African archaeofauna were presented at the conference, and these served as a starting point for the eventual compilation of this special issue of *African Archaeological Review*.

A. R. Antonites (✉) · K. Scott
Department of Anthropology and Archaeology, University of South Africa, Pretoria, South Africa
e-mail: annie.antonites@aya.yale.edu

E. Grody
Department of Anthropology and Archaeology, University of Pretoria, Pretoria, South Africa

South African Archaeozoology

In South Africa, archaeozoology has been an active research field since the 1970s, with pioneers such as C.K. (Bob) Brain, Richard Klein, Kathryn Cruz-Uribe, Graham Avery, Margaret Avery, Ina Plug and Elizabeth (Liz) Voigt advancing the field for decades to come (see Badenhorst 2008; Brain 2007; Klarreich 2004; Plug 1999a, 2010; Marshall and Mutundu 1999). Since then, a host of scholars have published faunal data from numerous archaeological sites—spanning the Early Stone Age up to the recent past. In fact, the South African faunal record is one of the most extensively represented in all of African archaeological literature (cf. Gifford-Gonzalez 1999; Marshall and Mutundu 1999).

For the purposes of this special issue, however, our discussion of South African archaeozoology focusses on the last 2,000 years. The "last 2,000 years" is used in its broadest sense to include the conventional chronological demarcations of the final Later Stone Age (c. 100–2100 BP, for the purposes of inclusion here), Early Iron Age (AD 200–900), Middle Iron Age (AD 900–1300), Late Iron Age (AD 1300–1840) and partly overlapping historical period (c. the last 500 years) (Huffman 2007; Lombard et al. 2012; Mitchell 2013: 480–482; Swanepoel et al. 2008). Although our time bracket—the last 2,000 years—encompasses diverse economic, social and political expressions—which often intersect in time and space (e.g., Mitchell 2013: 480–482; Sadr 2008a)—the overarching theme involves the presence of livestock.

Cattle, sheep and goats take centre stage in archaeozoological studies of the last 2,000 years, from their introduction and spread (see Sadr 2008b, 2013; Smith 2014 for overviews; also Orton et al. 2013; Russell and Lander 2015) to their importance in subsistence economies (e.g., Arnold 2008; Arnold et al. 2013; De Wet-Bronner 1994; Plug 1999b; Plug and Voigt 1985; Voigt 1983) and centrality in sociopolitical and settlement organisation (e.g., Badenhorst 2009, 2010; Hall 1986; Huffman 1993, 1998, 2001, 2010; see also Smith et al. 2010). For the Later Stone Age, coastal and seasonal subsistence strategies are also well represented in the literature (e.g., Dewar 2008; Jerardino 1997, 2014; Jerardino et al. 2009; Plug et al. 2010).

Datasets generated through these studies have unquestionably contributed to our understanding of human lifeways. Continued research efforts dedicated to diet and animal husbandry attest to their importance as a focus in the region's archaeology. However, discussions of archaeozoological perspectives on, for example, non-domesticates, foodways, feasting, identity, interaction, political economy, ritual and symbolism (e.g., Boeyens and Van der Ryst 2014; Brunton et al. 2013; Henshilwood et al. 1994; Hutten 2008; Orton 2012; Sadr 2004; Whitelaw 2009; Wilmsen 2015; see also Thorp 1995) appear less frequently. Such studies tend to play a supplementary illustrative role rather than driving broader archaeological narratives—especially in Iron Age (or agro-pastoralist) and historical contexts. Archaeozoologists must therefore take the lead in diversifying the scope of human-animal research related to the last 2,000 years.

Local Perspectives and Expectations

As part of the introduction to the ASAPA session, we wanted to gain a general understanding of what archaeologists who work in the region considered to be the most important past and future contributions of southern African archaeozoology to the broader discipline. We circulated a short online questionnaire to all locally and internationally based ASAPA members (n = 385) and the Southern African Archaeology Student Council (n = 126) in early 2015. Members are involved in archaeological work in Botswana, Lesotho, Malawi, Mozambique, Namibia, South Africa, Swaziland and Zimbabwe. Although a relatively small number of people responded—40 professionals and 27 students—some general trends did emerge.

Archaeologists working on all time periods were represented, with sizeable research interest in the historical period and minimal interest in the Early Stone Age; the Middle and Later Stone Age as well as Iron Age periods were all fairly evenly represented. Sixty percent of respondents had, at some stage, incorporated faunal data into their research projects—not surprisingly, the majority of which were professional members. The remaining 40% were evenly divided between professionals and students who had never used faunal material as part of their research. Broadly speaking, the majority of archaeologists—regardless of the time period(s) in which they work—have thus worked with archaeozoological data. If the survey sample is taken as regionally representative, almost two-thirds of archaeologists who work in southern Africa, whether

professional or student, are consumers of archaeozoological data and can benefit directly from theoretical, methodological and technical advances in the field. As such, the contributions collated in this issue will be relevant to a broad audience, both locally and across the continent.

According to the survey, the most significant archaeozoological contributions to our understanding of the past have come from Stone Age (particularly Middle Stone Age) and palaeontological contexts at sites such as Klasies River, Sibudu Cave, Florisbad and Sterkfontein (e.g., Brink 1987, 1988; Clark and Plug 2008; Klein 1989; Reynolds and Kibii 2011), and through the work of faunal specialists Brain and Klein (see Brain 2007; Klarreich 2004; Gifford-Gonzalez 1999 for selected references). Important archaeozoological contributions stemming from later sites and periods were less often cited. The majority of survey responses related to this period mentioned the Limpopo Valley—particularly Voigt's (1983) work at K2 and Mapungubwe, as well as Plug's contributions to Iron Age archaeozoology in general (see Badenhorst 2008 for selected references). The most common themes associated with archaeozoology include subsistence studies, taxonomic proxies for palaeo-environmental reconstructions and, for the later periods, animal husbandry practices.

In terms of future research efforts, palaeo-environmental reconstructions (earlier periods) and aspects related to domesticated animals (later periods) remain important avenues through which archaeozoologists are expected to contribute to the discipline. Topics associated with the latter include continued efforts to understand the introduction and spread of domesticates in the region and more insight into herding strategies and bloodlines. Encouragingly, and in-line with global trends (e.g., Russell 2012; Sykes 2014), southern African archaeozoologists were urged to address the social aspects of human-animal interactions.

The centrality of research on the various developments and expressions of sociopolitical complexity in the region (e.g., Boeyens 2016; Chirikure et al. 2014; Denbow 1999; Huffman 2009; Loubser 1991; Pikirayi 2013; Reid et al. 1997; Schoeman 2013) was also evident in the survey responses. Respondents indicated several future research directions under this theme: development of complex societies, urbanism, gender studies, migration and the movement of people, as well as continued focus on social and material transitions linked to sociopolitical development and the mechanisms that drive such changes—all topics that archaeozoology has shown to be of relevance elsewhere (e.g., Ashby 2004; deFrance 2009; Hockett 1998; Paris 2015; Teeter 2004; Weissbrod et al. 2014).

The survey also showed that archaeologists were concerned with the ability of archaeology to "illuminate the more recent history of communities," and to "better understand and appreciate the development of modern society" through elucidating the "politics of contemporary identity" as well as incorporating indigenous knowledge systems into our interpretive frameworks (quotes from survey; cf. Mulaudzi et al. 2010; Swanepoel et al. 2008). Again, archaeozoology is ideally situated to contribute to these topics, given the important and often central role that animals and their products played in shaping the recent history of southern Africa. In South Africa, for example, the large-scale economic, social, political and ideological changes that resulted from the arrival of missionaries and European settlers; the effects of the rinderpest epidemic; Cape Frontier Wars and Xhosa cattle killings; South African War; and the booming ivory, ostrich and wool trades, all involved animals (e.g., Beinart 1990, 2003; Carruthers 2005; Comaroff and Comaroff 1986; Pastoret et al. 2006; Peires 1989; Stein 2007; Swart 2010).

Finally, calls for interdisciplinary and multidisciplinary work featured strongly in the survey, which included better integration of faunal and other material studies, as well as increased use of analyses such as heavy and light isotopes, aDNA, taphonomy and experimental studies. The articles in this special issue provide several such examples, including the first application of ZooMS in southern African archaeology (Coutu et al. 2016).

Current Approaches to the Archaeozoology of the Last 2,000 years

The contributions in this issue shed new (or renewed) light on the ways in which we think about the role of animals and their "products" during the last 2,000 years in South Africa. Topics addressed include craft production and use of worked bone at K2 and Mapungubwe (Antonites et al. 2016), earliest evidence for the ivory trade in southern Africa (Coutu et al. 2016), intensive procurement and processing of wild animals by Early Iron Age agro-pastoralists (Grody 2016), importance of livestock in Later Stone Age hunter-gatherer subsistence strategies (Dusseldorp 2016) and, from a methodological

perspective, evaluating the methods used in taxonomic identification (Horsburgh et al. 2016). And, although none of the contributions to this issue specifically relate to the Late Iron Age/historical period, or involve other southern African countries, the questions and methods discussed also apply to these periods and areas.

Given the growing local demand and following global trends, this issue includes articles that approach archaeofauna from diverse analytical angles: ZooMS and isotopes (Coutu et al. 2016), aDNA (Horsburgh et al. 2016), use-traces (Antonites et al. 2016), taphonomy (Grody 2016) and large-scale meta-analysis (Dusseldorp 2016). These methods hold tremendous interpretive advantages, yet their complications and limitations should also be acknowledged, a point which all of the authors discuss. Quantitative synthesis of available faunal datasets (Dusseldorp 2016) as well as revisiting "old" collections from new theoretical and methodological angles (Antonites et al. 2016; Ashley et al. 2016; Grody 2016) will become common archaeozoological practice and serve as a reminder to present data and curate collections in ways that will enable future study (see e.g., Arbuckle et al. 2014; Atici et al. 2013; Jones and Gabe 2015).

Linked to standardised and accessible archaeozoological data is the issue of methodological transparency, and the critical evaluation of data quality (Gobalet 2001; O'Connor 1996; Wolverton 2013). Questions regarding the validity of certain taxonomic identifications in South Africa have been raised (Horsburgh et al. 2016) and offer a welcome platform to reflect on the challenges and complexities of archaeozoological practice in South(ern) Africa. Communication between specialists and archaeologists—in print—is a step towards raising awareness of the methodological issues that underpin our interpretations (e.g., Bousman et al. 2016; Horsburgh and Moreno-Mayar 2015; Scott and Plug 2016). In this regard, confirming key taxonomic specimens through complementary analyses (Coutu et al. 2016; Horsburgh et al. 2016) and combining multiple lines of evidence (Antonites et al. 2016; Coutu et al. 2016; Grody 2016; see also Steele 2015) will go a long way to strengthen archaeozoological arguments.

Conclusion

Our recent survey found that southern African archaeologists overwhelmingly associate major archaeozoological contributions in the region with pre-2000 BP Stone Age archaeology. This, despite the large body of archaeozoological (and historical) literature that illustrate the rich and complex nature of human-animal interactions during the last 2,000 years. Archaeozoology has tremendous potential to elucidate the nuances of past sociopolitical, economic and ideological processes, but the region's archaeological community has yet to take full advantage of it. This special issue's focus on the last 2,000 years thus stems from a need to highlight the broader utility of faunal datasets and to present some of the approaches currently employed to address bigger archaeological questions. Although far from being a comprehensive representation of current research in the field, these papers (and the selected references provided here) show how archaeozoology can create and contribute to new debates, as well as provide new perspectives on ongoing debates in South(ern) African and indeed African archaeology. We hope that this will stimulate further dialogue and a greater realisation of the contributions human-animal interaction studies can make to the archaeology of the last 2,000 years.

Acknowledgments Thanks to the ASAPA authors and presenters who contributed to the success of the initial session, as well as to our discussant Natalie Swanepoel, whose comments inspired some of the points raised here. Thanks also to the current authors who diligently kept to the submission schedule and complied with all of our demands. We appreciate the input from Alexander Antonites, Tim Forssman and Natalie Swanepoel on previous drafts of this paper. Finally, the completion of this special issue would not have been possible without the incredible support from the Editor-in-Chief, Adria LaViolette.

References

Antonites, A. R., Bradfield, J., & Forssman T. (2016). Technological, functional and contextual aspects of the K2 and Mapungubwe worked bone industries. *African Archaeological Review*, *33*(4).

Arbuckle, B. S., Kansa, S. W., Kansa, E., Orton, D., Çakırlar, C., Gourichon, L., Atici, L., et al. (2014). Data sharing reveals complexity in the westward spread of domestic animals across Neolithic Turkey. *PloS One, 9*(6), e99845.

Arnold, E. R. (2008). A consideration of livestock exploitation during the Early Iron Age in the Thukela Valley, KwaZulu-Natal. In S. Badenhorst, P. Mitchell, & J. C. Driver (Eds.), *Animals and people: Archaeozoological papers in honour of Ina Plug* (pp. 152–168). Oxford: British Archaeological Reports.

Arnold, E. R., Greenfield, H. J., & Creaser, R. A. (2013). Domestic cattle mobility in early farming villages in southern Africa: Harvest profiles and strontium ($^{87}Sr/^{86}Sr$) isotope analyses

from Early Iron Age sites in the Lower Thukela River Valley of South Africa. *Archaeological and Anthropological Sciences, 5*, 129–144.

Ashby, S. P. (2004). Understanding human movement and interaction through the movement of animals and animal products. In M. Mondini, S. Muñoz, & S. Wickler (Eds.), *Colonisation, migration and marginal areas: A zooarchaeological approach* (pp. 4–9). Oxford: Oxbow Books.

Atici, L., Kansa, S. W., Lev-Tov, J., & Kansa, E. C. (2013). Other people's data: A demonstration of the imperative of publishing primary data. *Journal of Archaeological Method and Theory, 20*(4), 663–681.

Badenhorst, S. (2008). Ina Plug: A tribute. In S. Badenhorst, P. Mitchell, & J. C. Driver (Eds.), *Animals and people: Archaeozoological papers in honour of Ina Plug* (pp. 1–6). Oxford: British Archaeological Reports.

Badenhorst, S. (2009). The Central Cattle Pattern during the Iron Age of southern Africa: A critique of its spatial features. *South African Archaeological Bulletin, 64*(191), 148–155.

Badenhorst, S. (2010). Descent of Iron Age farmers in southern Africa during the last 2000 years. *African Archaeological Review, 27*(2), 87–106.

Beinart, W. (1990). Empire, hunting and ecological change in southern and central Africa. *Past & Present, 128*, 162–186.

Beinart, W. (2003). *The rise of conservation in South Africa: Settlers, livestock, and the environment 1770–1950*. Oxford: Oxford University Press.

Boeyens, J. C. A. (2016). A tale of two Tswana towns: In quest of Tswenyane and the twin capital of the Hurutshe in the Marico. *Southern African Humanities, 28*, 1–37.

Boeyens, J. C. A., & Van der Ryst, M. M. (2014). The cultural and symbolic significance of the African rhinoceros: A review of the traditional beliefs, perceptions and practices of agropastoralist societies in southern Africa. *Southern African Humanities, 26*, 21–55.

Bousman, C. B., Mauldin, R., Zoppi, U., Higham, T., Scott, L., & Brink, J. (2016). The quest for evidence of domestic stock at Blydefontein Rock Shelter. *Southern African Humanities, 28*, 39–60.

Brain, C. K. (2007). Fifty years of fun with fossils: Some cave taphonomy-related ideas and concepts that emerged between 1953 and 2003. In T. R. Pickering, C. D. Schick, & N. P. Toth (Eds.), *Breathing life into fossils: Taphonomic studies in honor of C.K. (Bob) Brain* (pp. 1–24). Gosport: Stone Age Institute Press.

Brink, J. S. (1987). The archaeozoology of Florisbad, Orange Free State. *Memoirs of the National Museum, 24*, 1–151.

Brink, J. S. (1988). The taphonomy and palaeoecology of the Florisbad Spring fauna. *Paleoecology of Africa, 19*, 169–179.

Brunton, S., Badenhorst, S., & Schoeman, M. H. (2013). Ritual fauna from Ratho Kroonkop: A second millennium AD rain control site in the Shashe-Limpopo confluence area of South Africa. *Azania: Archaeological Research in Africa, 48*(1), 111–132.

Buckley, M., Collins, M., Thomas-Oates, J., & Wilson, J. C. (2009). Species identification by analysis of bone collagen using matrix-assisted laser desorption/ionisation time-of-flight mass spectrometry. *Rapid Communications in Mass Spectrometry, 23*, 3843–3854.

Carruthers, J. (2005). Changing perspectives on wildlife in southern Africa, c.1840 to c.1914. *Society & Animals, 13*(3), 183–200.

Chirikure, S., Manyanga, M., Pollard, A. M., Bandama, F., Mahachi, G., & Pikirayi, I. (2014). Zimbabwe culture before Mapungubwe: New evidence from Mapela Hill, southwestern Zimbabwe. *PloS One, 9*(10), e111224.

Clark, J. L., & Plug, I. (2008). Animal exploitation strategies during the South African Middle Stone Age: Howiesons Poort and post-Howiesons Poort fauna from Sibudu Cave. *Journal of Human Evolution, 54*(6), 886–898.

Comaroff, J., & Comaroff, J. (1986). Christianity and colonialism in South Africa. *American Ethnologist, 13*(1), 1–22.

Coutu, A. N., Whitelaw, G., Le Roux, P., & Sealy, J. (2016). Earliest evidence for the ivory trade in southern Africa: Isotopic and ZooMS analysis of seventh–tenth century AD ivory from KwaZulu-Natal. *African Archaeological Review, 33*(4). doi:10.1007/s10437-016-9232-0.

De Wet-Bronner, E. (1994). Late Iron Age cattle herd management strategies of the Soutpansberg region. *South African Archaeological Bulletin, 49*(160), 90–95.

deFrance, S. (2009). Zooarchaeology in complex societies: Political economy, status, and ideology. *Journal of Archaeological Research, 17*(2), 105–168.

Denbow, J. R. (1999). Material culture and the dialectics of identity in the Kalahari: AD 700-1700. In S. K. McIntosh (Ed.), *Beyond chiefdoms: Pathways to complexity in Africa* (pp. 110–123). Cambridge: Cambridge University Press.

Dewar, G. (2008). The archaeology of the coastal desert of Namaqualand, South Africa: A regional synthesis. Oxford: British Archaeological Reports.

Dusseldorp, G. L. (2016). Faunal assemblage structure suggests a limited impact of the introduction of domestic stock on Later Stone Age subsistence economies in South Africa. *African Archaeological Review, 33*(4). doi:10.1007/s10437-016-9229-8.

Évora, M. A. (2015). Use-wear methodology on the analysis of osseous industries. In J. M. Marreiros, J. F. G. Bao, & N. F. Bicho (Eds.), *Use-wear and residue analysis in archaeology* (pp. 159–170). New York: Springer.

Gifford-Gonzalez, D. (1999). Zooarchaeology in Africa: The first two million years. *Archaeozoologia, 10*, 55–82.

Gobalet, K. W. (2001). A critique of faunal analysis; Inconsistency among experts in blind tests. *Journal of Archaeological Science, 28*(4), 377–386.

Grody, E. (2016). Of buffalo and butchers: Coupling traditional procurement studies with taphonomic analyses to explore intensive wild animal processing patterns at two Early Iron Age sites in the Kruger National Park. *African Archaeological Review, 33*(4). doi:10.1007/s10437-016-9236-9.

Hall, M. (1986). The role of cattle in southern African agropastoral societies: More than bones alone can tell. *South African Archaeological Society Goodwin Series, 5*, 83–87.

Hamilton, J., & Thomas, R. (2012). Pannage, pulses and pigs: Isotopic and zooarchaeological evidence for changing pig management practices in later medieval England. *Medieval Archaeology, 56*(1), 234–259.

Henshilwood, C., Nilssen, P., & Parkington, J. (1994). Mussel drying and food storage in the late Holocene, SW Cape, South Africa. *Journal of Field Archaeology, 21*(1), 103–109.

Hockett, B. S. (1998). Sociopolitical meaning of faunal remains from Baker Village. *American Antiquity, 63*(2), 289–302.

Horsburgh, K. A., & Moreno-Mayar, J. V. (2015). Molecular identification of sheep at Blydefontein Rock Shelter, South Africa. *Southern African Humanities, 27*, 65–80.

Horsburgh, K. A., Orton, J., & Klein, R. G. (2016). Beware the springbok in sheep's clothing: How secure are the faunal identifications upon which we build our models? *African Archaeological Review, 33*(4). doi:10.1007/s10437-016-9231-1.

Huffman, T. N. (1993). Broederstroom and the Central Cattle Pattern. *South African Journal of Science, 89*, 220–226.

Huffman, T. N. (1998). Presidential address: The antiquity of *lobola*. *South African Archaeological Bulletin, 53*(168), 57–62.

Huffman, T. N. (2001). The Central Cattle Pattern and interpreting the past. *Southern African Humanities, 13*, 19–35.

Huffman, T. N. (2007). *Handbook to the Iron Age: The archaeology of pre-colonial farming societies in southern Africa*. Scottsville: University of KwaZulu-Natal Press.

Huffman, T. N. (2009). Mapungubwe and Great Zimbabwe: The origin and spread of social complexity in southern Africa. *Journal of Anthropological Archaeology, 28*, 37–54.

Huffman, T. N. (2010). Debating the Central Cattle Pattern: A reply to Badenhorst. *South African Archaeological Bulletin, 65*(192), 164–174.

Hutten, L. (2008). Symbolic animal burials from the Venda region in the Limpopo Province, South Africa. In S. Badenhorst, P. Mitchell, & J. C. Driver (Eds.), *Animals and people: Archaeozoological papers in honour of Ina Plug* (pp. 186–199). Oxford: British Archaeological Reports.

Jerardino, A. (1997). Changes in shellfish species composition and mean shell size from a late-Holocene record of the west coast of southern Africa. *Journal of Archaeological Science, 24*(11), 1031–1044.

Jerardino, A. (2014). Variability in late Holocene shellfish assemblages: The significance of large shore barnacles (*Austromegabalanus cylindricus*) in South African West Coast sites. *Journal of Archaeological Science, 52*, 56–63.

Jerardino, A., Horwitz, L. K., Mazel, A., & Navarro, R. (2009). Just before Van Riebeeck: Glimpses into terminal LSA lifestyle at Connies Limpet Bar, West Coast of South Africa. *South African Archaeological Bulletin, 64*(184), 75–86.

Jones, E., & Gabe, C. (2015). The promise and peril of older collections: Meta-analyses and the zooarchaeology of late prehistoric/early historic New Mexico. *Open Quaternary*, *1*(1), p.Art.6.

Kintigh, K. W., Altschul, J. H., Beaudry, M. C., Drennan, R. D., Kinzig, A. P., Kohler, T. A., Limp, W. F., et al. (2014). Grand challenges for archaeology. *PNAS, 111*(3), 879–880.

Klarreich, E. (2004). Biography of Richard G. Klein. *PNAS, 101*(16), 5705–5707.

Klein, R. G. (1989). Why does skeletal part representation differ between smaller and larger bovids at Klasies River Mouth and other archaeological sites? *Journal of Archaeological Science, 16*(4), 363–381.

Lombard, M., Wadley, L., Deacon, J., Wurz, S., Parsons, I., Moleboheng, M., Swart, J., & Mitchell, P. (2012). South African and Lesotho Stone Age sequence updated. *South African Archaeological Bulletin, 67*(195), 123–144.

Loubser, J. H. N. (1991). The ethnoarchaeology of the Venda-speakers in southern Africa. *Navorsinge van die Nasionale Museum, 7*(7), 146–464.

Maltby, M. (Ed.) (2006). *Integrating zooarchaeology*. Oxford: Oxbow.

Marshall, F., & Mutundu, K. (1999). The role of zooarchaeology in archaeological interpretation: A survey of the African literature from later archaeological periods, ca 20 000 BP-present. *Archaeozoologia, 10*, 83–106.

Mitchell, P. (2013). Southern African hunter-gatherers of the last 25,000 years. In P. Mitchell & P. Lane (Eds.), *The Oxford handbook of African archaeology* (pp. 473–488). Oxford: Oxford University Press.

Mulaudzi, M., Schoeman, M. H., & Chirikure, S. (2010). Continuing conversations at the frontier. *South African Historical Journal, 62*(2), 219–228.

O'Connor, T. P. (1996). A critical overview of archaeological animal bone studies. *World Archaeology, 28*(1), 5–19.

Orton, D. C., Morris, J., Locker, A., & Barrett, J. H. (2014). Fish for the city: Meta-analysis of archaeological cod remains and the growth of London's northern trade. *Antiquity, 88*(340), 516–530.

Orton, J. (2012). Tortoise burials in Namaqualand: Uncovering ritual behaviour on South Africa's West Coast. *Azania: Archaeological Research in Africa, 47*(1), 99–114.

Orton, J., Mitchell, P., Klein, R. G., Steele, T., & Horsburgh, K. A. (2013). An early date for cattle from Namaqualand, South Africa: Implications for the origins of herding in southern Africa. *Antiquity, 87*, 108–120.

Paris, P.-E. (2015). Socio-economic changes and their implication in the consumption and trade of meat during the La Tène period in northern France: The cases of the Villeneuve-Saint-Germain and Condé-Sur-Suippe (Aisne) Oppida. *Anthropozoologica, 50*(1), 5–20.

Pastoret, P.-P., Yamanouchi, K., Mueller-Doblies, U., Rweyemamu, M. M., Horzinek, M., & Barrett, T. (2006). Rinderpest—an old and worldwide story: History to c. 1902. In T. Barrett, P.-P. Pastoret, & W. Taylor (Eds.), *Rinderpest and peste des petits ruminants: Virus plagues of large and small ruminants* (pp. 86–104). London: Academic.

Peires, J. B. (1989). *The dead will arise: Nongqawuse and the great Xhosa cattle-killing movement of 1856–7*. Bloomington: Indiana University Press.

Pikirayi, I. (2013). The Zimbabwe culture and its neighbours: Origins, development, and consequences of social complexity in southern Africa. In P. Mitchell & P. Lane (Eds.), *The Oxford handbook of African archaeology* (pp. 915–927). Oxford: Oxford University Press.

Plug, I. (1999a). Animal remains from archaeological sites in southern Africa as a tool to redress history. *Archaeozoologia, 10*, 107–116.

Plug, I. (1999b). Some Early Iron Age communities of the eastern escarpment and Lowveld, South Africa: A faunal perspective. *Archaeozoologia, 10*, 189–200.

Plug, I. (2010). In memoriam—Elizabeth (Liz) Anne Voigt (1944–2010). *Azania: Archaeological Research in Africa, 45*(2), 139–140.

Plug, I., & Voigt, E. A. (1985). Archaeozoological studies of Iron Age communities in southern Africa. *Advances in World Archaeology, 4*, 189–238.

Plug, I., Mitchell, P., & Bailey, G. (2010). Late Holocene fishing strategies in southern Africa as seen from Likoaeng, highland Lesotho. *Journal of Archaeological Science, 37*(12), 3111–3123.

Reid, A., Lane, P., Segobye, A., Borjeson, L., Mathibidi, N., & Sekgarametso, P. (1997). Tswana architecture and responses to colonialism. *World Archaeology, 28*(3), 370–392.

Reynolds, S. C., & Kibii, J. M. (2011). Sterkfontein at 75: Review of palaeoenvironments, fauna and archaeology from the hominin site of Sterkfontein (Gauteng Province, South Africa). *Palaeontologica Africana, 46*, 59–88.

Russell, N. (2012). *Social zooarchaeology: Humans and animals in prehistory*. Cambridge: Cambridge University Press.

Russell, T., & Lander, F. (2015). 'What is consumed is wasted': From foraging to herding in the southern African Later Stone Age. *Azania: Archaeological Research in Africa, 50*(3), 267–317.

Sadr, K. (2004). Feasting on Kasteelberg? Early herders on the west coast of South Africa. *Before Farming, 2004*(3), 1–17.

Sadr, K. (2008a). An ageless view of first millennium AD southern African ceramics. *Journal of African Archaeology, 6*(1), 103–129.

Sadr, K. (2008b). Invisible herders? The archaeology of Khoekhoe pastoralists. *Southern African Humanities, 20*, 179–203.

Sadr, K. (2013). A short history of early herding in southern Africa. In M. Bollig, M. Schnegg, & H.-P. Wotzka (Eds.), *Pastoralism in Africa: Past, present and futures* (pp. 171–197). New York: Berghahn Books.

Schoeman, M. H. (2013). Southern African late farming communities. In P. Mitchell & P. Lane (Eds.), *The Oxford handbook of African archaeology* (pp. 929–941). Oxford: Oxford University Press.

Scott, K., & Plug, I. (2016). Osteomorphology and osteometry versus aDNA in taxonomic identification of fragmentary sheep and sheep/goat bones from archaeological deposits: Blydefontein Shelter, Karoo, South Africa. *Southern African Humanities, 28*, 61–79.

Smith, A. B. (2014). *The origins of herding in southern Africa: Debating the "Neolithic" model*. Saarbrucken: Lambert Academic Publishing.

Smith, J., Lee-Thorp, J., Prevec, S., Hall, S., & Späth, A. (2010). Pre-colonial herding strategies in the Shashe-Limpopo Basin, southern Africa, based on strontium isotope analysis of domestic fauna. *Journal of African Archaeology, 8*(1), 83–98.

Steele, T. E. (2015). The contributions of animal bones from archaeological sites: The past and future of zooarchaeology. *Journal of Archaeological Science, 56*, 168–176.

Stein, S. A. (2007). 'Falling into feathers': Jews and the Trans-Atlantic ostrich feather trade. *Journal of Modern History, 79*(4), 772–812.

Swanepoel, N., Esterhuysen, A., & Bonner, P. L. (Eds.) (2008). *Five hundred years rediscovered: Southern African precedents and prospects*. Johannesburg: Wits University Press.

Swart, S. (2010). Horses in the South African War, c. 1899–1902. *Society & Animals, 18*(4), 348–366.

Sykes, N. (2014). *Beastly questions: Animal answers to archaeological issues*. London: Bloomsbury Academic.

Teeter, W. G. (2004). Animal utilization in a growing city: Vertebrate exploitation at Caracol, Belize. In K. F. Emery (Ed.), *Maya zooarchaeology: New directions in method and theory* (pp. 177–192). Los Angeles: Cotsen Institute of Archaeology.

Thorp, C. (1995). *Kings, commoners and cattle at Great Zimbabwe Tradition sites*. Museum memoir no. 1. Harare: National Museums and Monuments of Zimbabwe.

Twiss, K. C. (2012). The archaeology of food and social diversity. *Journal of Archaeological Research, 20*, 357–395.

VanDerwarker, A. M., & Peres, T. M. (2010). *Integrating zooarchaeology and paleoethnobotany: A consideration of issues, methods, and cases*. New York: Springer.

Voigt, E. A. (1983). *Mapungubwe: An archaeozoological interpretation of an Iron Age community*. Pretoria: Transvaal Museum.

Weissbrod, L., Malkinson, D., Cucchi, T., Gadot, Y., Finkelstein, I., & Bar-Oz, G. (2014). Ancient urban ecology reconstructed from archaeozoological remains of small mammals in the Near East. *PloS One, 9*(3), e91795.

Whitelaw, G. (2009). An Iron Age fishing tale. *Southern African Humanities, 21*, 195–212.

Wilmsen, E. N. (2015). Ostrich eggshells and their beads. *South African Archaeological Bulletin, 70*(201), 89–105.

Wolverton, S. (2013). Data quality in zooarchaeological faunal identification. *Journal of Archaeological Method and Theory, 20*(3), 381–396.