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To Hell with Ethnoarchaeology ... and Back!

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ABSTRACT



In 2016 Olivier Gosselain published a paper in *Archaeological Dialogues* suggesting that ethnoarchaeology should “go to hell”. His provocation misrepresents the ethnoarchaeology of the past quarter century, as is evident in a literature of which he appears largely unaware. Here we refute his charges, showing, for example, that ethnoarchaeologists neither regard the societies with which we work as living fossils, nor do we entertain naïve stereotypes regarding their workings. Our refutations are accompanied by commentaries on topics raised that introduce readers to the substantial recent literature. Far from a wreck, ethnoarchaeology, a form of material culture studies practiced by and mainly for archaeologists, has vigor and relevance, making theoretical, methodological and historical contributions that are worldwide in scope. And as we demonstrate for Africa, non-Western ethnoarchaeologists contribute substantially to the ethnoarchaeological literature.

KEYWORDS

Gosselain; literature review; ethnoarchaeology; archaeological inference; technologies; theory; practice; methods

A Call to Arms

In 2016, a paper by Olivier Gosselain (2016) reached us saying “to hell with ethnoarchaeology”, fiercely attacking the core of what we have been doing in Africa since the early 1980s. Gosselain is a Belgian student of material culture whose 1995 doctoral thesis, of which ND was external examiner, was an impressive study of the *chaînes opératoires* – the sequences of socio-technical choices – of 82 potters drawn from 21 Southern Cameroonian populations. He is now a foremost expert on contemporary African ceramics and his opinion carries weight. Thus our need to respond. We are not the first to do so. In the very year that the English version of Gosselain’s attack on ethnoarchaeology appeared, *World Archaeology* (2016, 609–713) published a set of articles on “Debating ethnoarchaeology” with accompanying commentaries that, collectively, invalidate his thesis. We refer to several of these below. A year later Roux published a brief reply in *Archaeological Dialogues*, vigorously disagreeing with Gosselain and emphasizing the importance of ethnoarchaeology’s “approach to highlighting anthropological regularities [both static and dynamic] and unveiling their generative mechanisms, with the ultimate goal of applying these regularities to archaeological data” (Roux 2017, 228). However, a more general and explicit rebuttal of Gosselain’s assertions is needed to set the record straight. In doing so

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this paper goes far beyond rebuttal, and provides a literature review that focuses primarily on the past two decades of ethnoarchaeological research of which Gosselain appears unaware. The paper emphasizes the theoretical, methodological and informational importance of ethnoarchaeology and exposes archaeologists to the extraordinary topical and geographic range of recent studies. We hope to convince others to incorporate ethnoarchaeology into their interpretative approaches and practice and teach it themselves.

The amount of ethnoarchaeological research in the past 20 years is considerable. For this reason, we restrict our review to ethnoarchaeology based in ethnographic field study that was conducted since the publication of David and Kramer's (2001) *Ethnoarchaeology in Action*. The review is structured around our response to Gosselain's charges. We do not discuss ethnoarchaeology's historic development as this is available elsewhere (Cunningham 2009; Lane 2005, 2015), nor experimental archaeology, a sister discipline deserving separate review. Based on these parameters, we quantify ethnoarchaeology publications by topic and geographic location for the period January 2010–December 2018, a nine-year span (Table 1). A list of 372 publications used in this table was generated from the Anthropology Plus database using the search term "ethnoarchaeology". All duplicate entries and papers whose authors exclusively identified their research as community archaeology, experimental archaeology, or archaeological ethnography were removed. The resulting list is far from comprehensive. It does not include research published as books, book chapters, theses and dissertations or sources not included in the Anthropology Plus database. Table 1 presents the summary of the so-edited Anthropology Plus list with the caveat that it under-reports ethnoarchaeological literature for this period. Nevertheless, the table provides a reasonable baseline to compare with David and Kramer's (2001) Table 1.5 for the nine-year period (1990–1998). This comparison shows changes in topical and geographic concentration of ethnoarchaeological research over time and provides some quantitative and qualitative data for discussion. However, we use the much broader literature in our response to Gosselain's charges and our review of the past two decades of contemporary ethnoarchaeological research. The Anthropology Plus list is also used to identify the publications of African researchers. Africa is the continent with the greatest concentration of ethnoarchaeological research and, as Africanist ethnoarchaeologists, we were astounded by Chirikure's (2016) recent statement that Africans rarely participate in ethnoarchaeology. The survey presented in Table 2 demonstrates the significant contribution that African ethnoarchaeologists have and continue to make to the sub-discipline.

Definitions

Ethnoarchaeology is not defined by any particular theory or approach; in North America, ethnoarchaeology proved useful to positivists but was neither their invention nor restricted to their use (Cunningham 2009). David and Kramer (2001, 33–62) have shown that processual, post-processual and other approaches informed ethnoarchaeological work in the latter part of the twentieth century. In the past two decades ethnoarchaeologists have kept pace with shifts in archaeological theory including theoretical frameworks that use indigenous ontologies (Apoth and Gavua 2010; K. Arthur 2018; Brady and Kearney 2016; Chétima 2016; Fredriksen 2011); studies of cultural transmission including *chaîne opératoire* and communities of practice (Degoy 2008; Gosselain 2008; Herbich and

Table 1. Ethnoarchaeology articles published 2010–2018.

Prime topic and area	Various	N Am. & Mesoamerica	C Am. & Carib.	S Am.	Sub-Saharan Africa	N Africa	Eur. incl. Russia	C Asia China Mongolia	SW Asia	S Asia	SE Asia	Oceania Australia	N	%
Theory & method	25	6	0	4	3	0	4	1	1	0	1	3	48	12.9
SFP	0	0	0	1	3	0	1	1	1	2	1	1	11	3.0
Plant & animal domestication	0	0	0	2	2	0	0	0	0	0	0	0	4	1.0
Foraging	1	0	0	4	4	0	2	0	0	0	0	1	12	3.2
Fishing/shell-fishing	0	3	1	3	2	0	0	0	0	2	1	1	13	3.5
Pastoralism	0	0	0	0	3	0	5	2	1	0	0	0	11	3.0
Herding	0	1	0	1	0	0	4	2	0	0	0	0	8	2.2
Farming/agriculture	0	0	0	1	0	0	2	1	0	0	0	0	4	1.0
Food prep/alcohol/consumption/feasting	0	2	0	1	3	0	3	0	0	1	1	0	11	3.0
Fire installations, hearths, ovens, fuel	4	0	0	1	1	0	2	2	1	1	0	2	14	3.8
Lithics: flaked stone tools	0	0	0	1	6	0	2	0	0	1	0	1	11	3.0
Grindstones	0	2	0	0	4	0	0	0	0	1	0	0	7	1.9
Ceramics	0	2	0	11	32	0	4	0	2	8	1	1	61	16.4
Metallurgy	0	0	0	2	4	0	0	0	0	1	0	0	7	1.9
Other artifacts, material culture	0	2	0	2	4	0	2	0	4	1	0	0	15	4.0
Organization of production	0	0	0	1	3	0	0	0	0	0	0	0	4	1.0
Cultural transmission	1	0	0	0	3	0	1	0	0	0	0	1	6	1.6
Distribution, trade, exchange	0	1	0	2	0	0	1	0	1	1	0	1	7	1.9
Settlement patterns	0	1	0	8	3	0	4	1	2	0	0	0	19	5.1
Space/architecture	0	1	0	0	6	1	2	0	1	0	0	0	11	3.0
Mortuary practices	0	0	0	1	3	0	1	0	2	0	1	0	8	2.2
Social Identity	0	1	1	1	5	0	0	0	1	1	0	0	10	2.7
Social memory	0	1	0	0	2	0	0	0	0	0	0	0	3	0.8
Rites, Ritual, ceremonies	0	2	0	2	3	1	0	0	0	1	0	0	9	2.4
Ontology/religion/rock art/landscape	0	5	0	1	8	0	2	1	0	2	0	4	23	6.2
Community/heritage management	0	0	0	0	2	0	0	0	0	0	0	0	2	0.5
Retrospective reviews	22	3	0	0	2	0	0	0	0	0	0	2	29	7.8
Other studies	0	2	0	0	0	1	0	1	0	0	0	0	4	1.0
<i>N</i>	53	35	2	50	111	3	42	12	17	23	6	18	372	100
%	14.3	9.4	0.5	13.4	29.8	0.8	11.3	3.2	4.6	6.2	1.6	4.9	100	

Note: Excluded are books, chapters in books and ethnoarchaeological studies that do not self-identify as such in the title, key words, or text elements examined (e.g. archaeological ethnographies).

Source: *Anthropology Plus* database.

Dietler 2008; Wallaert 2008; Wendrich 2012), how social identities are materially constituted (Bowser 2000; Bowser and Patton 2004; Lane 2008; Lyons 2014), materiality (Boivin 2008; González-Ruibal 2014), object agency and studies that contribute to symmetrical approaches that break down barriers between human and non-human entities (K. Arthur 2018; Chétima 2018; Wayessa 2017). Given that during and since the second half of the twentieth century ethnoarchaeology was developing in both western and non-western countries (see Biagetti and Lugli 2016; Marciniak and Yalman 2013; Politis 2015), we must expect that definitions of our practice and choice of theory and methods will vary depending on historical circumstances of emergence.

While described as a sub-discipline, a research strategy, an approach, a methodology (David and Kramer 2001; Kamp and Whittaker 2016; Lane 2005, 2015; Lyons 2013; Lyons and Casey 2016; Marciniak and Yalman 2013; Politis 2016; Skibo 2009), at its core ethnoarchaeology comprises forms of ethnography carried out by archaeologists wishing to understand the relationships between people and their tangible, intangible and invisible worlds. A significant role of ethnoarchaeology is the development and testing of archaeological and other theories in real-life contexts (Lyons and Casey 2016). In most cases ethnoarchaeologists aim to help archaeologists faced with fragmentary and re-contextualized data to better interpret the past. Ethnoarchaeologists no longer deal in simple material correlates, explanations or truths. For some time, far more than the handmaiden of archaeology, ethnoarchaeology has been making multiple contributions to material culture studies, its research into a myriad contemporary societies contributing to the general anthropological aim of understanding human variability in the present and past (Politis 2015). It addresses salient contemporary issues including climate change (Biagetti 2014; Loveless 2017), illegal migration (Pisoni 2016), inequality and marginalization (J. Arthur 2013, 2014; Kohtamaki 2010; Lyons and Freeman 2009; Wayessa 2016), and identity politics (Mikhailov 2013). It teams up with other disciplines such as experimental archaeology and archaeometry to achieve new insights, as in Soulignac's 2016 innovative study of forging and forge slags in Mali. Ethnoarchaeology also contributes to other disciplines, including a study of Boko Haram in cultural historical context by Scott MacEachern (2018).

Despite its contributions, ethnoarchaeology, together with archaeology and anthropology, has faced criticism to which its practitioners have responded. A necessary shift in ethnographic research over the past two decades is related to the postcolonial critique and self-evaluation of anthropological practice that has resulted in requirements that research with living communities follows ethical guidelines and progressively engages with local communities, a process culminating in community archaeology, itself frequently informed by ethnoarchaeology (Schmidt and Pikirayi 2016). As Africanist researchers we are cognizant of the impact of colonialism on the interpretation of African pasts, and of the need to reflect upon and confront these ideologies in our work (*Azania* 2014, 49:2 [special issue]; Andah 1995; Fewster 2001, 2013; Karega-Munene and Schmidt 2010; Lane 2005; Schmidt 2009), as must ethnoarchaeologists working elsewhere (Politis 2015). Ethnoarchaeology's early contributions to decolonizing archaeological interpretations in Africa is its record of publications that challenge the colonial and androcentric narratives that underpin older archaeological and racist interpretations (see MacEachern 2006) that make archaeology less western-centric (González-Ruibal 2016). Nevertheless, the project to decolonize archaeological and ethnoarchaeological practice is far from complete. Innocent Pikirayi

Table 2. African ethnoarchaeologists and their publications 2010–2018.

Sub-Saharan Africa	African authors and co-authors	Total Papers	Topics
Ethiopia	Abdi Aseffa, Agazi Negash, Alemseged Beldados, Bula Sirika Wayessa, Daniel Hiruy, Temesgen Burka, Yonatan Sahle	9	indigenous plant domesticates, social identity, beer brewing, ceramics, <i>chaînes opératoires</i> , ethnohistory, iron smelting, iron working, lithics, agriculturalists, religious beliefs
Somalia	Sade Mire	1	religious beliefs and practices
Uganda	Kingongo Remigius	1	royal pottery and symbolism
Kenya	Chapurukha Kusimba, Kennedy Mutundu, Freda Nkirote M'Mbogori	3	hunter gatherers, pastoralists, community archaeology, heritage, site formation processes
Tanzania	E.B. Ichumbaki, Edwinus Christantus Lyaya	3	fish and shellfish consumption, iron working
Zimbabwe	Godhi Bvocho, Happinos Marufu, C.B. Saanane, Plan Shenjere-Nyabezi	4	gender, theoretical critique, pastoralists, funerary rites and ceremonies, ceramics, culture heritage management
Botswana	Goitseone Molatlhegi, Phenyoo C. Thebe	3	ceramic <i>chaînes opératoires</i> , petrology
southern Africa	Foreman Bandama	1	knowledge transmission, memory
Equatorial Guinea	E. Asouti	1	wood fuel management
RDC, Angola	Mandela Kaumba	2	pottery, <i>chaînes opératoires</i>
Cameroon	Melchisedek Chétima, J-M. Datouang Djossou, Augustin Holl	5	vernacular architecture, domestic space, social identity, ontology, belief systems, object biography, settlement patterns, pastoralists, farmers, analogy, metalworking, ceramics
Nigeria	J.O. Aleru, David A. Aremu, G. D. Dalat, Zacharis Gundu, A.M. Ibeanu, Aliyu Adamu Isa, Joan-Mary Ogiogwa, Samuel Oluwole Ogundele, Akinwumi Ogundiran, P. Ogunfolakan, Pat Uche Okpoko, Emeka E. Okonkwo, J. B. Tubosun, Chinyere Ukpokolo	7	ceramics, memory, social identity, vernacular architecture and space, mortuary practices, trade and exchange, cultural transmission, ethnohistory, <i>chaînes opératoire</i> , heritage management
Senegal	Abdoulaye Camara, H.Diaw Diadhio, E. Dioh, Mandiéme Faye, Mathieu Guèye, Ndèye Sokhna Guèye	2	shellfishing, shell middens, ceramics, social identity
Mali	Daouda Keita	1	ceramics
Ghana	Wozi Apoh, J. Boachi-Ansah, G. A. Mansah Eyifa, Kodzo Gavua	4	settlement patterns, mortuary practices, social identity, ritual, rites and ceremonies, ontology, belief systems
	Subtotal	47	
N. Africa			
Morocco	Ali Amahan, Rahma El Hraiki	2	dwellings, ceramics
	Subtotal	2	

(2015, 535) has warned that if archaeology is to have a future in Africa, then it must be framed in indigenous knowledge systems and epistemologies that make sense to Africans, ontologies that are often shunned as unscientific by archaeologists. The need to broaden theoretical approaches to integrate indigenous ontologies is salient to archaeology in colonial contexts worldwide. This is an area in which ethnoarchaeology can make an important contribution (K. Arthur 2018). Increasingly, ethnoarchaeologists are using indigenous ontologies to frame their research (K. Arthur 2018; Brady and Kearney 2016; Chétima 2016, 2018; David 2001; Fredriksen 2011; González-Ruibal, Hernando, and Politis 2011; Kearney 2010; Lyons 1998, 2014; Mire 2015; Schmidt 2009; Schmidt and Mapunda 1997; Wayessa 2015, 2018). Kathryn Arthur (2018) suggests that using non-Western ontologies creates better science by challenging the production of theoretical tautologies based in the universal and uncritical application of Western philosophy in archaeological inference.

Others (Cunningham and MacEachern 2016; González-Ruibal 2018; Killick 2015a) have noted further the economic and technical disparity between Western and non-Western researchers and the people that we study, and the West's privileged position in writing other people's histories. Politis (2015, 68), referring to increasing globalization, suggests that the boundary between "us" and "ethnographic others" is becoming "fuzzy, dynamic, and situational". While globalization may be universal, the advantages and disadvantages for Western researchers and those they study are unequal and dissimilar (Cunningham 2003). The growing participation of non-Western scholars in ethnoarchaeology (see below) further enriches our understanding of alternative perspectives. Meanwhile, there is all the more reason for the multiple obligations and requirements of western researchers to submit to ethical certification, codes of conduct, ethical research evaluation and permit requirements, and, as Lane (2014a) has suggested, to engage in more inter- and intra-disciplinary discussion about ethics.

In sum, ethnoarchaeology is a dynamic practice, making it important to address Gosselain's comments against the sub-discipline.

Gosselain's Charges Against Ethnoarchaeology

Gosselain mounts an all-out attack on ethnoarchaeology's ideology, theory, methodology and fieldwork. However, the sub-discipline he depicts bears little resemblance to that practiced by ethnoarchaeologists of repute over the past two decades (see Lane 2005; Politis 2015; Skibo 2009). Although he has published his paper twice – in French (2011) and English (2016) – most of his charges are merely asserted without either the evidence or argument that one expects in academic publications. In what follows we refute his seven major charges one by one, in each case adding a review of modern ethnoarchaeological research in the elaboration of our arguments. We also refute a further claim regarding the viability of ethnoarchaeology as a discipline.

Charge 1. "Living Fossils"

Gosselain (2016, 219) claims that ethnoarchaeology is characterized by an ideology deriving from the Enlightenment that, especially in its evolutionary form, "views modern Western societies as the outcome of a historical process whose earlier stages are still experienced by exotic people", demonstrating a "pervasive belief in the existence of 'living fossils'". Thus, he contends, ethnoarchaeology's guiding principle is to study the lifeways of such exotics as the closest analogs to those of societies known through archaeology. He specifically attacks archaeologists for using the "San" foragers of southern Africa as "living references" (Gosselain 2016, 219) but ignores more recent ethnoarchaeological hunter-gatherer-fisher (HGF) research in Eastern and Central Africa (Lupo and Schmitt 2002), the Americas (Dionne 2015; Greaves and Kramer 2014; Marchione and Bellelli 2013; Politis 2000; Silva 2015), Australia (Brady and Bradley 2014; Cole 2011; Kearney 2010), SE Asia (Nobayashi 2000), Japan (Watanabe 1998) and Siberia (Jordan 2002/2003). What Gosselain denigrates as "Stone Age ethnoarchaeology" bears no relation to contemporary research conducted in longitudinal studies for example by Frink (2002, 2005) among the Yu'pik of Alaska, and Jarvenpa and Brumbach (Brumbach and Jarvenpa 1997; Jarvenpa and Brumbach 2009, 2014, 2015) among the Dene in Saskatchewan.

While Gosselain's criticism applies to some, though far from all, studies of the 1950s into the 1980s (see Politis 2015), such examples do not represent the practice of ethnoarchaeology over the past two decades. Lane (2005) describes ethnoarchaeology's history of evolving practice leading to recognition that research must be situated in its historical, political and ecological context in order to avoid presenting people as "perpetually traditional". This very issue hit academic headlines three decades ago when the revisionist Kalahari debate erupted following the publication of Wilmsen's (1989) *Land Filled with Flies*, a critique of those HGF writings that presented southern Africa's foragers as pristine, unaffected by the networks of exchange and socio-political dynamics of the past two millennia. The debate continues to stimulate anthropological, archaeological and ethnoarchaeological research on the history of southern African forager groups (Barnard 2006; Horsburgh, Moreno-Mayar, and Gosling 2016; Lee 1991; Mabulla 2007; Mitchell et al. 2008; Sadr 1997; Wilmsen and Denbow 1990) and serves as a general lesson for the need to historically situate ethnoarchaeological research.

In sum, ethnoarchaeology does not study "others" because they are "relics from the past" but because they experience and interact with the contemporary world from different historic, technological and cultural perspectives that are distinct from those of most archaeologists (Cunningham and MacEachern 2016, 9; Fewster 2013).

Commentary: On Hunter-gatherer Ethnoarchaeology

The study of foragers continues to be critical to Human Behavioral Ecologists who develop universal evolutionary models to interpret foragers across time and space. While such studies raise ethical concerns regarding the ahistoric representation and use of contemporary people for the sole purpose of interpreting human ancestors (González-Ruibal 2009; Lyons and Casey 2016), Politis (2015) points out that they also contribute significant original ethnographic information on contemporary foragers. Some further challenge androcentric evolutionary models by addressing women's and children's roles in foraging and hunting (Bird and Bliege Bird 2000; Coddling et al. 2016; Hawkes 2016; Lupo 2017; Lupo, Fancher, and Schmitt 2013; Lupo and Schmitt 2002, 2016, 2017; Schmitt and Lupo 2008).

Nevertheless, there is far more to ethnoarchaeological research on HGF societies than constructing evolutionary models (Lane 2014b). In a body of research that is historically situated, recognizing the changes attributable to sedentism, changing diet, and the use of modern technology such as freezers and motorboats, Brumbach and Jarvenpa (1997) deconstruct the colonial and western anthropological dyad of "man the hunter and woman the gatherer", and demonstrate that women's and men's roles are subject to dynamic change. Contrary to androcentric archaeological models, women control complex technologies, resource storage and distribution, and are active participants in big game hunting and fishing. The same authors adopted Spector's (1983) task differentiation model to eliminate researcher gender bias in interviews by asking men and women the same questions and considering the multiple roles taken by men, women and children in subsistence tasks. Friesen's (2002) research amongst the Cambridge Bay Inuit was initiated by the indigenous community, a situation that encouraged him to integrate ethnoarchaeological research into his studies. This experience allowed him to ask new research questions of the archaeological data while producing

work of interest to the Inuit. Ethnoarchaeology has also been used as political commentary. Dawson (1995) demonstrates the failure of Euro-Canadian-style housing, built for Inuit families by the Canadian federal government, to meet the functional and social needs of Inuit who, at the time of study, were sedentary but still actively hunting, gathering and fishing.

In a recent review Lane (2014b) concluded that future HGF studies should focus on a greater geographic breadth of such societies, and to continue to address under-represented aspects of these societies including ontology, belief systems, ritual perceptions of landscape and the materiality of social identities. Many of these issues are being addressed in research in South America and Australia. HGF research in South America focuses on ontology, economic variability, and effects of global encounters (Politis 2015). González-Ruibal, Hernando, and Politis (2011) used a relational-ontology approach to explore how Awa men's perceptions of self is intrinsically interwoven with the making and using of arrows. The Awa are undergoing material and cultural transformations with increasing contact with mainstream Brazilian society, but the continued manufacture and use of arrows is underpinned by its importance in male self-perception. González-Ruibal (2014) further used this approach to study HGF populations in the southern borderlands of Ethiopia.

In Australia, ethnoarchaeologists are developing and implementing new methodologies that are sensitive to aboriginal communities. For instance, Kearney's (2010) "ethnoarchaeology of engagement" explores how aboriginal populations have deep historic and spiritual engagement with places and spaces that are not recorded in archaeological surveys because they lack significant material evidence. This disconnect can have devastating consequences for aboriginal communities, their histories, and their relationships with ancestors and spirits when archaeological assessments are used in commercial development. Aboriginal relationships with rock art and other places include the perception of the continuing presence of ancestors and spirits in these places and landscapes, resulting in very different understandings of rock art than those held by most archaeologists, and these perceptions are being incorporated into recent ethnoarchaeological research (Brady and Bradley 2014; Brady et al. 2016; Brady and Kearney 2016; McNiven 2016). Brady and Kearney (2016) suggest that we open our research methods to incorporate these different epistemologies in our interpretations, including a greater research emphasis on invisible cultural elements active in people's daily lives (McNiven 2016). This approach makes ethnoarchaeological research relevant to aboriginal communities and their ongoing histories of place. Studies also explore ritual practices of HGF in creating ritual landscapes in the Guatemala highlands (Brown and Emery 2008) and in Siberia by the Khanty (Jordan 2002/2003). The Khanty have persisted in ritual practices in their landscapes in the face of long term Russian colonization and their inclusion in international economies (Jordan 2004).

It is, however, important to realize that the majority of ethnoarchaeological research in the past two decades does not focus on HGF societies. From the sample of 372 papers presented in Table 1 (2010–2018), only 6.7% ($n = 25$) focused on foragers, fishers and shellfishers (HGF). Eight HGF studies were conducted in South America, six were on African foragers and fishers, three in North America and fewer reported respectively for Oceania/Australia, Europe/Russia, S and SE Asia and Central America. Other studies of foragers did not focus on subsistence strategies and are listed under the topic of ontology/religion/rock

art/ritual landscape, particularly in Australia and South America. However, this category is not exclusive to foraging and fishing societies.

Charge 2. Naive Stereotypes of Exotic Societies

Citing himself as an example, Gosselain claims that ethnoarchaeologists espouse naive stereotypes of exotic societies, “depict[ing] ... an ongoing, harmonious process of interweaving social relationships, world views and ‘ways of doing’ to the point that production techniques ‘are social rather than material necessities’ ...” Has there been “too strict a focus on symbols and rituals in the study of non-western technologies” (Gosselain 2016, 222–2–23)? To make his case, Gosselain focuses on the ethnoarchaeology of metallurgy. He comments unfavorably on Barndon’s (1996) exploration in her doctoral dissertation of the many social and symbolic factors in Fipa smelting that have to be taken into consideration in the study of African iron production. Peter Schmidt’s (1997) *Iron technology in East Africa* is also criticized, though in this work the emphasis on magic and ritual is less Schmidt’s and more that of the Haya and Barongo men recruited to reenact smelts and (re-)construct a poorly remembered technology. The point that Gosselain misses is that in many societies ritual is understood as part of the technological process, and dismissing people’s understanding of this process is bad social science.

Ethnoarchaeologists are rarely sufficiently qualified to be able to cover both the anthropological and metallurgical aspects of iron working, the most complicated technological complex they are likely to study. For this reason, in the absence of a specially trained specialist like Soulignac (2016), studies of smelting and forging are best carried out by multi-disciplinary teams (David et al. 1989). This particular piece of MAP research demonstrated that Dokwaza, a Mafa iron master, intentionally manufactured cast iron, besides steel and wrought iron, in his furnace. While metallurgists make observations in the field, understanding the process of the smelt requires studies of its products and byproducts that can only be carried out in a laboratory. It is not therefore surprising that ethnoarchaeologists working on their own should focus on anthropological aspects. But this does not mean that they are unaware or dismissive of the economic context and its implications. Schmidt’s research on Haya and Barongo ironworking was both long term and comprehensive, integrating oral history, archaeology and ethnoarchaeology. Metallurgical aspects of the work were undertaken primarily by Terry Childs and D. H. Avery (Childs and Schmidt 1985; Schmidt 1997). David (2001) in a survey of selected examples of smelting argues that neither naturalist nor anti-naturalist studies (see David and Kramer 2001, 37–38) suffice on their own to portray the technical and symbolic richness of African ironworking and advocates an approach that draws on the anthropology of techniques (Lemonnier 1993) precisely because it is concerned both with actual objects, artefacts and technical processes, and with the mental objects (social representations) that refer to them. Schmidt’s (1997) monograph comes close to this ideal.

In summary, the ethnoarchaeology of iron working has given the lie to colonial tropes of African technological inferiority and presented African iron-making as innovative, variable and of social, economic and ideological importance (Fluzin et al. 2001; Haaland, Haaland, and Dea 2000; Killick 2015a, 2016; Robion-Brunner 2010; Schmidt 2010).

Gosselain, who has never himself studied any one culture in depth, we think underestimates the complementarity of science, metaphor and metonymy in African iron production and in other technologies including weaving (Lane 2008) and pottery-making (Fredriksen 2009, 2011; Fredriksen and Bandama 2016; Wayessa 2015, 2016, 2017). His charge of ethnoarchaeological naïveté does not hold water.

Commentary: On the Complexity of Factors Structuring Technologies

The complexity of socio-economic and ideational factors structuring technological practice has been well evidenced by ethnoarchaeological research. In many but not all African societies (see Rowlands and Warnier 1996) a thermodynamic metaphor associates smelting with human reproduction (Apentiik 1997, 157–160; Barndon 1996; Childs and Killick 1993; David 2001; Herbert 1993; Schmidt 1997, 2009). Ritual practices significant in preparing and conducting smelts across sub-Saharan Africa in the twentieth century included metonymic processes of treating the furnace with medicines to achieve effects akin to treatments for the human body (David 2001; Lyaya 2010, 2011; Rowlands and Warnier 1996; Schmidt and Mapunda 1997). However, the industry was also structured by material concerns relating to ores and availability of labor (Killick 2015a). David (2012b) took a regional approach to explain iron production in the northern Mandara Mountains in terms of comparative advantage and regional specialization. Other studies address how metal workers (and sometimes their wives) are perceived in their societies as different ontological categories of people, often with important ritual roles and/or as possessors of dangerous occult powers (David and Sterner 2012; Frank 1998; Lyons 2014; Sterner and David 1991; Van Beek 1982; Wade 2012; Warnier 2012). Copper and iron objects are also widely perceived in sub-Saharan Africa as having intrinsic capabilities to provide protection and to act as a medicine against enemies, sorcerers and witches (Apoth and Gavua 2010; David, Sterner, and Gavua 1988; Lyons 1998; Schmidt 1993).

A focus on object meaning or social choices in manufacture does not negate concern for functionality whatever the technology. Giblin and Remigius (2012) propose a “symbolic ceramic ethnoarchaeology” that looks at the technical, functional and symbolic use of pots. In their study of the royal pottery and potters of Buganda, they conclude that pottery, like iron smelting in this area, was as a heat transformative technology conceptually linked with human reproduction (cf. Fredriksen 2009, 2011; Fredriksen and Bandama 2016; Herbert 1993). An assimilation of pots and people is characteristic of many societies, sometimes requiring taboos, offerings, and rituals to ensure that wet vessels (infants) transform into functional pots (adults). Breaking a pot in some societies requires payments analogous to retribution for the murder of a human being (Wayessa 2015, 2016). Many other examples exist of social identities and social perceptions that are constituted in the material, perhaps the most evocative being that of the highlands of Madagascar and the perception that people “harden” with age, to be commemorated with tombs and stele of stone, a building material reserved for the ancestors (Parker Pearson 1998). A metaphor of containment may also link pots, people and spirits (Apoth and Gavua 2010; David, Sterner, and Gavua 1988; Lyons 1998; Sterner 2003, 116–141).

Semiotic, symbolic and ontological studies by ethnoarchaeologists depict non-western world views that are critical to the understanding and appreciation of how

non-Western people perceive their material world. This is evident in the work of African ethnoarchaeologists. Using a “knowledge-centered approach”, based in oral history, folklore, local knowledge and material evidence that conserves tangible and intangible elements of heritage, Mire (2015) investigates Somali women’s use of the *wagar*, a sacred wooden sculpture and pre-Islamic fertility symbol associated with beliefs in the Sky-god and sacred trees. Chétima’s (2018) research in northern Cameroon addresses how the rarely used but elaborate rural houses of modern urban elites are interpreted by villagers as material evidence of their owners’ use of occult forces to acquire wealth.

Technological systems are also products of people’s material logic. Sillar (2000) observed that in Peru, people used similar technological solutions to resolve different types of material problems. African potters make analogies between pottery-making and bread-making, often using the same gestures and tools for working clay and dough (Giblin and Remigius 2012; Gokee and Logan 2014; Wilmsen et al. 2016). Technological logic is transferred through gendered learning networks and constitutes gendered ontological perceptions of space. In Tigray, Lyons (2009) found that rural men and women use distinct technological practices to construct places, spaces, and objects that they use in gendered divisions of labor and in their respective areas of domestic authority. These gendered practices and spaces are transgressed by practitioners of despised crafts, who use technology, gestures and spaces of the “wrong” gender and are described by non-artisans as “different types of men and women” (Lyons 2014). Such semiotic, symbolic and ontological studies depict non-western world views that are critical to the understanding and appreciation of how different people perceive that they act upon, and are themselves acted upon by the tangible, the intangible and the invisible cultural elements of the world they experience. They are as essential as economic, technical and archaeometrical studies to the unraveling of the human past.

Charge 3. The Range of Societies Studied

Gosselain (2016, 219) accuses ethnoarchaeologists of failing to study a sufficiently wide range of groups: “probably because they do not correspond to our preconceived image of prehistoric people”. This is both meaningless and ludicrous. Eight hundred and twenty-two studies (some of two or more ethnic groups) published between 1956 and 1998 covered all the major inhabited regions of the world and ranged over 16 broadly defined topical areas (David and Kramer 2001, Table 1.5). Group selection is not driven by pre-conceived ideas of a prehistoric people, but rather by the value of querying the practices of contemporaries who are more familiar with hunting, farming, fishing, making pottery and stone tools, and other practices of which only some societies have knowledge. Thus the Mandara Archaeological Project chose the northern Mandara Mountains of Cameroon and northeast Nigeria because our initial focus was on style and this area is one of high linguistic, ethnic and economic diversity (David, Sterner, and Gavua 1988). While there are types of human societies that have not been studied by ethnoarchaeologists – Gosselain mentions West African endogamous subgroups of hunters associated with highly hierarchical societies – selections are governed not by pre-conceived images but by a careful consideration of relevance and political and other non-academic constraints.

Commentary: Topics Chosen by Ethnoarchaeologists in Recent Years

While Gosselain does not comment directly on the range of topics studied by ethnoarchaeologists, this is worth discussion. Table 1 presents *articles* classified as ethnoarchaeology in the *Anthropology Plus* listings for the nine-year period 2010–2018. This shows a mean publication rate of 41.3 articles per year. This is an underestimate of total ethnoarchaeological publications since it excludes books, chapters, and other studies that were not specifically identified as ethnoarchaeology. With these qualifications, Table 1 can be compared with David and Kramer's (2001) Table 1.5 listing of ethnoarchaeological *publications* during the period 1990–1998. This shows a rate of 37.1 publications per annum. All major subsistence strategies and populated continents, most forms of socio-political organization, western and non-western societies, and various theoretical frameworks are represented in the 2010–2018 sample. Papers were categorized by area and by topic, the latter is somewhat subjective because most papers contributed to more than one category. For example, ceramic research might contribute to ceramic technology, style, social identity, distribution systems, belief systems and the social organization of production. It was also difficult to categorize the papers into the same primary topics as used in David and Kramer's (2001) earlier table. Research interests have kept pace with new methodological applications, particularly in geo-ethnoarchaeology to study site formation processes and in determining material/chemical signatures for example in fire installations, fuel sources, and food residues. Ethnoarchaeologists have new interests in understanding different group ontologies and perceptions of ritual landscapes including rock art, as well as how people constitute a variety of social identities in material, technological and spatial practices (Boivin 2008; Chétima 2016; Fredriksen 2011; McNiven 2016; Wayessa 2017, 2018; Wynne-Jones 2015, 62).

1. Changes by Area

Sub-Saharan Africa continues to produce the highest proportion of papers (29.8%), a drop of 9.1% from its representation in David and Kramer's table 1.5. Papers from North America/Mesoamerica remained constant 9.4% (we noted an enormous experimental archaeology literature from this area); South America increased from 6.3 to 13.4%, Europe/Russia from 3.9% to 11.3%, and Australia/Oceania from 3.0% to 4.9%. Decreases occurred in South Asia (9.0%–6.2%); SW Asia (6.0%–4.6%) and SE Asia (7.2%–1.6%).

2. Changes in Topics

Between 1990–1998 and 2010–2018 the proportion of papers on ceramics (16.4%), foragers (3.0%) and mortuary practices (2.2%) showed little change. However, theory and method (12.9%) increased by nearly 2.7%, which moves it into the second largest topical category in the 2010–2018 list. In 1990–1998 that honor was held by space and architecture. The increase in theoretical papers may reflect the maturity of the field and possibly an increasing role for ethnoarchaeology in testing archaeological theory.

3. Topics in Decline

Several topics declined or perhaps shifted in methodological approach. Site Formation Processes (SFP) declined from 8.7% to 3.0% partly because there were fewer taphonomic studies of bone assemblages and/or refuse behaviour. However, site formation processes have been stimulated by the application of geo-ethnoarchaeology, particularly in the cases of fishers and shell-fishers (Frink and Knudson 2010; Gaspar, Klokler, and DeBlasis 2011; Hardy et al. 2016; Ichumbaki 2014–2015; Knudson and Frink 2010; Silva 2015), and of pastoralists (Shahack-Gross 2017; Weissbrod 2010). With the passing of African iron smelters by the end of the

millennium, metallurgy declined from 5.7% to 1.9% of papers. There was a shift in focus from subsistence practices and their material/spatial identification toward explorations of ontology, religion, and the production of ritual landscapes.

Studies of space and architecture declined from 12.3% to 3.0%, distribution and trade from 3.6% to 1.9%, and organization of production and cultural transmission combined from 6.0% to 2.6%. Many papers addressed material culture production using the *chaîne opératoire* approach. These studies contributed to the study of organization of production and cultural transmission, but their topic was categorized as ceramics, lithics and other material categories. This is also true of the social context of production. Several researchers worked with casted or marginalized artisans, but their papers were categorized under the topics of ceramics, lithics or metallurgy.

4. Topics on the Rise

Studies of lithics increased. The 1990–1998 table did not separate chipped from ground stone tools, which we did in the 2010–2018 sample. Papers on lithics combined increased from 2.1% to 4.9%. Other material categories (textiles, beads, plaster-making, and hide working) increased from 2.1% to 4.0%. Overall, studies of material culture production and consumption remain strong foci of ethnoarchaeological research (34% of all papers in 2010–2018). Studies of settlement patterns also increased from 3.6 to 5.1%, perhaps an underestimate since the category excluded papers addressing ritual landscapes.

5. New topics

The development of geo-ethnoarchaeology in the past two decades has opened up new areas including residue analysis of alcoholic beverages and heat modification signatures that identify bread ovens, hearths and fuels. Papers on ideology made up 5.4% of the papers in David and Kramer's table. In the 2010–2018 period, such papers were subdivided into new categories: social memory, rites/ritual ceremonies, and ontology/religion/rock art/ritual landscape collectively totaling 9.4%.

While not a focus of ethnoarchaeological research in 2010–2018, style and ethnicity were not forgotten (Cruz 2011; Guèye 2011; Marufu and Saanane 2013). *Chaîne opératoire* studies, of which Gosselain is a major contributor, address technological styles, often of ceramics, as a material identity of social groups (ethnic groups, castes or communities of practice). Over the past 20 years such studies have increased dramatically in Africa (Calvo et al. 2016; Corniquet 2011; Fowler 2011; Gosselain 2001; Gosselain and Smith 2005; Kaumba Mazanga 2017; Kohtamaki 2010; Lyons et al. 2018; Mayor 2011; Wayessa 2016), and in South America (Carvalho-Amaro and García Rosselló 2012; Ramón 2013; Sillar and Joffré 2016). Ethnoarchaeologists have also investigated which stages of technological style represent different aspects of identity. For instance, Thebe and Sadr (2017) show that distributions of ceramic forming and shaping techniques in Botswana represent learning networks rather than ethnic and language group boundaries. In addition to technological styles, ethnoarchaeologists using other approaches have explored the materiality of identities of casted artisans (J. Arthur 2013), gender (K. Arthur 2013, 2018; Eyifa 2010/2011; Kaneko 2013), and children (Casey and Burruss 2010; Vitores 2012).

A new category of retrospectives, mainly published in *Ethnoarchaeology* and all of ethnoarchaeologists based in North America, provides reflections by and on researchers with long-term ethnoarchaeological programs. With increasing literature available on non-western ethnoarchaeological research, retrospectives of non-Western researchers are

appearing elsewhere (Biagetti and Lugli 2016; Kenig, Tikhonov, and Korusenko 2013; Kobyliński 2013; Kong 2013; Marciniak and Yalman 2013; Politis 2015).

Charge 4. Use of Analogy

“As vital as they may be ... the selection and use of analogies is far from evident and may lead to reasoning as flawed as those they are supposed to improve” (Gosselain 2016, 217). Gosselain is not attacking analogy, a form of inference based on comparison and fundamental to the interpretation of archaeological materials, but its application by ethnoarchaeologists. Analogical reasoning involves a hermeneutic approach, a working back and forth between an archaeological subject and an ethnographic source to determine the relevance of similarities and differences. Through the debate between Gould and Watson (1982) and the work of philosophers Alison Wylie (1982, 1985, 1988), Marcia Hanen and archaeologist Jane Kelley (Kelley and Hanen 1990), the do’s and don’ts of analogical argument were well established by the later 1980s. David and Kramer (2001, 43–54) provide a useful primer on the topic with archaeological examples. Ann Stahl (1993, 2001), Jay Cunningham (2009; Cunningham and McGeough 2018) and others (Fewster 2006, 2013; Lane 2005), have further refined the parameters of ethnographic analogy as applied to archaeological materials.

As to ethnoarchaeologists’ reasoning, Gosselain says very little. It is presumably archaeologists who apply analogies “without borders”. But archaeologists know only too well that their task is to coach the least improbable interpretation from data that are more or less decontextualized, fragmentary and in other ways unrepresentative or imperfect. There is a substantial archaeological literature on this topic of which Gosselain appears unaware. An excellent recent example is Chapman and Wylie’s (2015) edited volume *Material evidence* in which Wylie and Bradley provide an introduction to the larger – epistemic, philosophical, methodological and interdisciplinary – framework of argumentation within which analogy is deployed. Other contributors offer valuable case studies of the principles at work. Since ethnoarchaeologists are archaeologists, they should be, and generally are, aware of this literature and of the need for, *inter alia*, multiple working hypotheses, strategies of elimination, triangulation, abductive reasoning, and systemic reflection on the dynamics of archaeological process. In our fieldwork we have to be aware of the intersection of different knowledge systems and the possibilities and opportunities that can arise from such tensions. Engaging objects in material, social and symbolic terms, we have the huge advantage of being able to talk to the makers, distributors, users and discarders of material culture, an ethnographic process with its own rules of engagement.

Comment: Beyond Analogy

Not all ethnoarchaeologists would define their research objectives today as analogy building for archaeologists. Skibo (2009) views the true role of ethnoarchaeology not as providing archaeologists with analogies, but in exploring the relationships between people and things that contribute to the present as well as to the past. A strength of ethnoarchaeology is that we can incorporate intangible knowledge into our research (Biagetti and Lugli 2016) and material practices that archaeologists are, as noted below, unlikely to detect. McNiven (2016) rightly adds that we also explore relationships with invisible cultural entities in

terms of people's perception of the agency and continuing presence of ancestors and spirits. These entities are perceived to act on the world, for example, when rock art imagery fades. Aboriginal Australians see this as the image being withdrawn by ancestral spirits, while archaeologists regard it as weathering. These contrasting perceptions come from different engagements with landscape and contemporary aboriginal communities (Brady and Kearney 2016). The perceptions of past peoples may not be recoverable by archaeologists, but without awareness of such indigenous ways of perceiving, archaeologists risk misinterpretation of rock art sites and landscapes, not to mention alienation of the indigenous peoples of whose histories the art forms part.

Charge 5. The “Foolish Quest for Universal Laws”

Gosselain (2016, 220) is particularly dismissive of “the foolish quest for universal laws” of human behavior and predictive theory. We should, he writes, avoid “ethnoarchaeological modelling” and “immediately launch into historical work”. First let us say that there is nothing intrinsically wrong with broad law-like statements. Kramer's Law is a case in point: Typology reinforces principles of social structure including gender and power relationships, and reifies other aspects of world view (David and Kramer 2001, 177). The problem is that they are necessarily so general that they serve only for strategic guidance. We agree with Gosselain on the importance of historicity – ethnoarchaeology cannot be, as Valentine Roux (2007) once claimed, “a non-historical science of reference”. But modeling is what ethnoarchaeologists – and all scientists – do, and it encompasses a search for law-like statements at scales varying from broad cross-cultural generalizations to others valid only under the most tightly defined boundary conditions. This is followed by the testing of the models against evidence and, when they fail, their replacement by others. Such is progress. As ethnoarchaeologists have learned to appreciate the importance of historicity, they have turned their attention from the so-called universal towards situations in which relevant boundary conditions can be better defined and the applicability of generalizations more precisely determined. This trend in ethnoarchaeological research has produced more locally focused studies (Alexianu et al. 2010–2011; Williams 2015) that provide nuanced understandings of material and immaterial practices in specific contexts.

Commentary: On Models and “Historical Work”

Cunningham and MacEachern (2016), Skibo (2009) and Politis (2015, 64) are among the many researchers advocating and building interpretive models that have cross-cultural relevance. The range of such studies is as wide as ethnoarchaeology itself, embracing models of types of feasts used for social and political purposes (Adams 2004; Dietler and Hayden 2001), to Arnold's (1985) cultural ecology and its generalizations on average distances that potter's walk to clay sources, and to J. Arthur's (2002) suggestion that pitting on interior surfaces of beer pots can be used to determine household participation in feasting. None of these generalizations can be applied universally, but they provide potential analogies and baselines for comparison. A major focus of HGF research has been to provide predictive models of how HGF groups procured, processed and distributed resources within sites and across landscapes in different environments (Lane 2014b). Nevertheless, Grøn (2012) cautions on the uncritical use of HGF models without proper consideration of the local

context and human agency that create local variability. It is through new ethnoarchaeological studies and critical evaluation of existing models that new perspectives emerge. Shenjere-Nyabezi's (2016) ethnoarchaeological project in Zimbabwe challenges Huffman's (2001) once dominant Central Cattle Pattern (CCP) model of Bantu pastoralist compounds. The CCP model is used to infer social and ideological structures of male control of cattle, women, and ancestral power from spatial organization within a particular settlement plan. Huffman developed it not from ethnoarchaeology but from Kuper's (1982) ethnography of patrilineal Eastern Bantu-speakers in South Africa. The model is deeply controversial in southern African archaeology (see Wynne-Jones 2015, 60), but has been used extensively by archaeologists to interpret pastoralist sites and to project a largely static social and ideological structure over the past 2000 years. Shenjere-Nyabezi's research shows that women can receive cattle as bridewealth payments, have full authority over their animals, and keep them in the central kraal along with those of their husband or brothers. This challenges CCP assumptions of male wealth and influence based on large number of cattle in the central enclosure. Whether women have always had these privileges needs to be established, but Shenjere-Nyabezi's study demonstrates variability that does not fit the static androcentric model.

Ceramic ethnoarchaeologists have produced general models of how potters select raw materials to optimize vessel function (Skibo and Schiffer 2008), a model that archaeologists further use to infer vessel function. While such models are important, others focus on historical and social learning networks and how these affect artisanal choice of materials and shaping practices. Livingstone Smith (2000) criticized archaeological and experimental models of techno-functional and environmental determinants of pottery fabric, finding instead that potters' paste recipes are more influenced by spatial proximity and learning networks. Similarly, in the northern Mandara Mountains some forms and decorative styles (part of material *chaînes opératoires*) are shared by ethnic and linguistic groups with a long history of interaction (David, Sterner, and Gavua 1988; MacEachern 1994).

Gosselain's alternative to modeling is to launch into historical work. But, as argued above, all ethnoarchaeological research must take account of historical context and there is no logical difference between an inference founded on historical relationships between ethnoarchaeological source and archaeological subject and one where source and subject are unrelated. Upham (1987) and Stahl (1993) long ago pointed out that the assumption that historic relationships between archaeological subject and ethnoarchaeological source result in more reliable analogies is frequently incorrect. Equal rigor is required in evaluating such similarities and differences.

Charge 6. Clueless Methodology

"After half a century of research and publications, here is a 'sub-discipline' whose practitioners are still clueless about their specific research methods and endeavours. How less scientifically decipherable can that be?" (Gosselain 2016, 217). To which we reply: "How simplistic is that question?" Regardless of theoretical approach, ethnoarchaeologists worth their salt adhere to the underlying logic of the scientific method. But because their interests are so varied they utilize a wide range of methods drawn from archaeology, ethnography, history, ethnohistory, geography, geo-archaeology and archaeometry, frequently

incorporated into multi-disciplinary projects (Cantin and Mayor 2017; Huysecom et al. 2015; Killick 2015b; Lyons et al. 2018; Mayor et al. 2014; Sillar and Tite 2000).

Ethnographic methods include interviews, surveys, archival work, and participant observation. To record material practices, we use mapping, photography, satellite imagery and digital recordings, and we sample ceramic, lithic and other types of materials for laboratory analysis. If no one has as yet written a textbook on ethnoarchaeological methods, it is because many of the various techniques employed are either amply documented elsewhere or being developed to solve new problems. Appropriate methods are chosen and packaged to tackle particular projects. What we need to add is cultural sensitivity (David and Kramer 2001, 62–90). And, as Sillar and Joffré (2016) advise, it is often beneficial to keep methods simple and unobtrusive, keeping the focus on the social relationships that structure the production, distribution and consumption of material culture.

Commentary: On Ethnoarchaeology and Materials Science

Gosselain's criticism that ethnoarchaeology is only interesting when it works with other disciplines has little meaning since it is by its nature interdisciplinary. David Killick (2005), an archaeological scientist, once pointed out that ethnoarchaeology is often combined with science-based studies that contribute both to understanding materials and the relationship of technological choices to social practices, including in situations where technological acts are metaphors of human reproduction. More specifically

Archaeometallurgy is a four-legged stool with its legs being archaeological evidence, laboratory examination, experimental reproduction and ethnoarchaeology, the latter critically important because the imagination of those designing smelting or forging experiments in the western world is necessarily limited by their experience. (David Killick, pers. comm. 2019)

Similarly, Friesem (2016, 153) sees the interaction of archaeological science and ethnoarchaeology as mutually beneficial: "... geo-ethnoarchaeological studies... are the main source of reliable comparative data for associating human activity with chemical signatures found in archaeological sites". His paper provides an excellent review of the development of geo-ethnoarchaeology that emerged in the late 1990s, research that helped geo-archaeologists develop and refine interpretive guides for archaeological inference regarding human activities that produce specific chemical residues in anthropogenic soils (Knudson and Frink 2010; Wilson, Davidson, and Cresser 2008), site formation processes of earthen wall buildings (Boivin 2008; Friesem et al. 2011); micro-stratigraphy in determining activity areas in houses (Milek 2012); macro- and micro- structures in animal dung indicating different types of pastoral activities (Shahack-Gross, Marshall, and Weiner 2003; Shahack-Gross et al. 2004; Shahack-Gross, Simons, and Ambrose 2008), and the identification of combustion features (hearths and bread ovens) and fuels (Picornell Gelabert, Asouti, and Martí 2011; *Ethnoarchaeology* 2018, 2 [special issue]) through diagnostic changes caused by temperature or resulting traces (Gur-Arieh et al. 2013).

Beginning in the 1960s, Dean Arnold's (2000; Arnold et al. 1999) ethnoarchaeological research on ceramics in Central and South America tested the interpretive parameters of Neutron Activation Analysis to determine what exactly this method could tell archaeologists about ceramic sources, trade and other social and ecological factors, an enormous

contribution to ceramic analysis in contemporary archaeological practice. The validity of using lipid residues from pots to determine past peoples' diets was recently critically evaluated by Dunne et al. (2019) as part of ethnoarchaeological research on pottery use by Samburu pastoralists in Kenya. They conclude that tackling big issues like transitions from foraging to agriculture will require techniques from archaeological science and social archaeology. Their interweaving of the two approaches gives science relevant social context and offers ethnoarchaeology scientific insights into observed practices.

Ethnoarchaeology can also test archaeological inference based on the findings of material science. Whereas the firing temperatures of pottery can be determined by refiring sherds in ovens in the laboratory and by more sophisticated SEM and other, methods (Heimann and Maggetti 2010), it does not follow that, as was once believed, firing temperatures of potsherds can be used to differentiate between open and kiln firings. Following Gosselain (1992), Livingstone Smith (2001) monitored 105 bonfires in Africa and south Asia, and used thermometric data from 62 of these field firings and 18 comparable firings published by others to demonstrate that temperature is an *unreliable* means of determining firing structures, rendering further inference of technological and social complexity highly questionable.

To summarize, the lack of ethnoarchaeology methodology texts is evidence not of “scientific indecipherability” (whatever that may be) but of practitioners' willingness and ability to borrow from the social and natural sciences and incorporate them into innovative syntheses. Critically important, of course, is that ethnoarchaeological studies provide detailed information on the research methods employed. Sometimes technological practices are only known through ethnographic observation. For instance, Wilmsen et al. (2016) documented Botswana potters who prefer, despite locally available clay, to collect ores from 120 km away and then mechanically process these into clay, a practice deemed otherwise undetectable by the material scientists on the team.

Charge 7: Ethnoarchaeology's Minimal Contribution to Archaeology

We now turn to Gosselain's (2016, 216) most misleading and offensive charge: that ethnoarchaeology's “actual contribution to archaeology remains hardly decipherable”. Chapters 4–13 of *Ethnoarchaeology in Action* (David and Kramer 2001), describe and critique earlier achievements in the study of, *inter alia*, human residues, style, settlement systems, architecture, trade, and mortuary practices, giving the lie to Gosselain's accusation. Most ethnoarchaeologists view ethnoarchaeology as contributing to archaeological theory through its important and unique role of testing and critiquing archaeological theory in real-life contexts and in documenting the material and non-material practices of people around the globe (Cunningham and MacEachern 2016; Hamon 2016; Kamp and Whittaker 2016; Lyons and Casey 2016; Pratap 2016; Politis 2015, 41; Skibo 2009). Major archaeological theories and concepts of the past half century were informed by ethnoarchaeological research: new archaeology, processualism, post-processualism, phenomenology, materiality, and more recently “Archaeologies of the Contemporary World” (González-Ruibal 2006; Harrison and Breighoff 2017). So embedded is ethnoarchaeology in archaeological theory that archaeologists are not always aware of its contributions (see Hamon 2016; Lane 2015).

The accumulation of ethnoarchaeological research since 2001 is substantive enough to support lengthy reviews that include papers on ethnoarchaeology's general

contributions to archaeology (Fewster 2013; Lane 2015), as well as on specific topics, for example the ethnoarchaeology of HGF (Franco 2012; Kuznetsov 2006; Lane 2014b); geo-ethnoarchaeology (Friesem 2016), archaeometallurgy (Iles and Childs 2014); the use and evidence of fire (Mallol and Henry 2017, 2018), Old World water-sharing practices (Charbonnier 2018), gender (K. Arthur 2007; Eyifa 2010/2011; Jarvenpa and Brumbach 2006; Jones 2009), pastoralism (Biagetti 2019); and ceramic ethnoarchaeology (Arnold 2011; Stark 2003). Others have taken areal perspectives, relating to the Amazon (F. Silva 2009); Africa (Lyons 2013); North America (Skibo 2009); Latin America (Politis 2015); South America (Sillar and Joffré 2016); and ethnoarchaeology in non-Anglophone countries (Marciniak and Yalman 2013). Once again the evidence refutes Gosselain's charge.

Ethnoarchaeological research on several specific topics has had an impact on archaeological interpretation. Iles and Childs (2014, 198–199) state that the holistic ethnoarchaeological approaches to African iron-smelting improved the interpretation of archaeometallurgical remains world-wide, and shaped research questions and agendas. Many researchers use ethnoarchaeology as a starting point to reconstruct long-term social group interactions (David 2012a, 2012b; Gijanto 2011; Gokee 2011; Mayor 2011; Schmidt and Mapunda 1997; Stahl 2001). A developing contribution is the convergence of ethnoarchaeological and archaeological studies of learning and technological transmission using the *chaîne opératoire* and Communities of Practice approaches that critically inform our understanding of variability and change in material traditions (see Fredriksen and Bandama 2016; Roddick and Stahl 2016; Stark, Bowser, and Horne 2008; Wendrich 2012).

Ethnoarchaeology has, especially in recent years, contributed to archaeology at the large scale. While much ethnoarchaeological research has operated at the scale of the settlement or kin group, long term teamwork in the Philippines, Botswana, Mali, Mandara Mountains, Ethiopia, Madagascar, Mexico, Romania and elsewhere has vastly expanded the social ranges and spaces over which research is carried out, and thereby its relevance to archaeological interpretation from local to larger scales. Kramer's (1997) work on the supply of ceramics to Jodhpur city in Rajasthan is another type of large scale contribution to the archaeology of complex societies.

Ethnoarchaeologists continue to show a reflexive concern for innovation and theoretical and methodological progress. Cunningham and MacEachern's "Ethnoarchaeology as slow science" (2016) is a good example, arguing that good ethnoarchaeological research recognizes the ethical and human implications of scientific research; also the need for contemplation and collaborative learning, with a concern for communal aspects of such work; and critique of the intrusion of inappropriate practices and concepts from business and management.

Lane (2006, 2014a, 2015) suggests an important future direction of ethnoarchaeology is to explore how non-western people use material objects and places to build their histories as part of indigenous archaeologies. He found that men and women in Mali used houses and other material culture to remember their past, which he suggests is a form of indigenous archaeology. He argues that ethnoarchaeologists need to place more emphasis on topics of social memory and how non-western people constitute their past in materials, places and landscapes. Material tethering of a people's history is evident in many ethnoarchaeological studies (Arnold, Wynne, and Ostoich 2013; Brady and Kearney 2016; Insoll 2008; Kearney 2010; Livingstone Smith 2016), including how people return to ancestral shrines to appeal to ancestors for help in

contemporary issues (Denbow, Mosothwane, and Ndobochani 2009). Research in this area challenges the Western conceit of having invented archaeology (Lane 2006).

Gosselain's Claim: "The Ethnoarchaeology Star has Set"

Gosselain (2016, 217) misleads on the viability of ethnoarchaeology as an academic discipline. He states that "with the notable exception of some North American universities, ethnoarchaeology is very sporadically taught ...". This is incorrect. A brief internet search and emails to a few colleagues provided the following anecdotal sample. Ethnoarchaeology courses are taught in Canadian Universities (Calgary, Manitoba, Trent, Memorial, Alberta, and York) with additional departments listing ethnoarchaeology as a specialization of faculty members at U. Toronto, UBC, McMaster and Simon Fraser. American and Australian Universities advertise either ethnoarchaeology courses, expertise in ethnoarchaeology for graduate programs, or faculty with areas of specialization in ethnoarchaeology at Arizona, Florida, Chicago, Columbia, Flinders (which recently offered an ethnoarchaeology field school), Australia National University, Monash, and Wollongong universities. In Africa, ethnoarchaeology is or was recently taught at the Universities of Legon, Ibadan, Jos, Pretoria and Zimbabwe. Many faculty at Addis Ababa U. have specializations in ethnoarchaeology (including MA theses and PhD dissertations) but do not teach dedicated courses. Websites for European universities and information provided by selected colleagues mention courses taught at Uppsala, York, Newcastle, Nottingham, Bergen, and at Leiden, where ethnoarchaeology is taught as part of broader archaeological approaches. Ethnoarchaeology is not taught as a specific course in Italian Universities, but in Rome is connected to experimental archaeology and at Ferrara is taught with methods. Spain's National Research Council publishes an ethnoarchaeological series (*Colección Treballs d'Etnoarqueologia*), and ethnoarchaeology is taught as a course at a number of universities (Cantabria, the Balearic Islands) and in conjunction with experimental archaeology at Zaragoza, Seville, the Canaries and Madrid. In India it is taught at Deccan College. It would appear that ethnoarchaeology is routinely part of undergraduate education and post-graduate studies, either as dedicated courses or as a component of archaeological and experimental studies. Outside of the West, university engagement in teaching ethnoarchaeology as a long-term research strategy is evident in the experience of scholars who contributed to volumes edited by Marciniak and Yalman (2013) and by Biagetti and Lugli (2016). While this list is anecdotal (it is difficult to determine worldwide representation of current faculty specialization and course offerings) it is sufficient to challenge Gosselain's charge.

But perhaps the best evidence of the viability of ethnoarchaeology and of its resurrection from the colonialist underworld is the historic but increasing participation of ethnoarchaeologists who are not of the West. In a paper entitled "'Ethno' plus 'archaeology' what's in there for Africans" Chirikure (2016) demonstrates an idiosyncratic conception of ethnoarchaeology and is wrong both on "the absence of a decolonized ethnoarchaeological practice" and on the subdiscipline's domination by Binfordian positivism. However, he recognizes that "The subdiscipline represents an opportunity to develop a synergy between western and non-western philosophies resulting in a nuanced understanding of the past" and that it has the "potential to add to global theories". He also complains that "very few native African archaeologists are contributing"

to “the development of context-relevant ethnoarchaeologies that liberate and empower local communities across the globe”. He could not be more wrong on this last point. The African case is of particular relevance because this is the continent where ethnoarchaeology has always produced the greatest concentration of published research.

Of the 111 ethnoarchaeology papers on sub-Saharan Africa enumerated in [Table 1](#), a more detailed listing ([Table 2](#)) reveals that 47 papers, 42.3% of the total from sub-Saharan Africa, had African authors or co-authors. Of the 47 African authored and co-authored papers:

- 26 were by African sole authors
- 9 by African coauthors, mostly Nigerian and Ethiopian
- 12 were coauthored by African and non-African researchers, with Africans the first author of four of these papers

Only three papers on North African topics were published in the 2010–2018 period, two single authored by North Africans. To summarize: Sub-Saharan African ethnoarchaeologists contributed to 12.6% of the total ethnoarchaeology papers generated in the 2010–2018 list from all geographic areas, and adding North Africa brings the total to 13.2%.

The African authors wrote on a range of topics comparable to those of researchers elsewhere: site formation processes (Hardy et al. 2016; Ichumbaki 2014–2015); forager and pastoralist strategies (Holl 2013; Shenjere-Nyabezi 2016), ceramics (Gijanto and Ogun-diran 2011; Ibeanu and Dalat 2010–2011; Isa 2015; Kaumba Mazanga 2017; Kéita 2014; Thebe and Sadr 2017), lithics (Sahle and Negash 2016), social identity (Aseffa et al. 2016; Calvo et al. 2016), architecture and space (Ogundele and Umoh 2013), ethnohistory, technological styles, metal working (Lyaya 2010, 2011; MacEachern et al. 2013), ontology and religion (Apoth and Gavua 2010; Mire 2015), mortuary practices (Eyifa 2010/2011; Gundu 2012; Marufu and Saanane 2013), domestication of indigenous plants (Hiruy and Beldados 2018; Wayessa 2016), wood fuel management (Picornell Gelabert, Asouti, and Martí 2011), and heritage (Okpoko and Okonkwo 2010/2011). Neither should we forget the African researchers who published ethnoarchaeological studies in the course of careers that began before our 9-year survey. Our no doubt incomplete list includes: E. Kofi Agorsah, Angele Dola Aguihah, K. D. Aiyedun, Rowland Apentiik, Raymond Assombang, Martin Elouga, Caleb A. Folorunso, Banni Guene, Francis Korkor, Bertram Mapunda, Osaga Odak, J. Ako Okoro, Victor Raharijaona, and Simiyu Wandibba.

These data indicate that African researchers are significant and active contributors to ethnoarchaeological research. The appeal of ethnoarchaeology may partly be because it is (*contra* Chirikure) a far more affordable practice than archaeology (Cunningham and MacEachern 2016, 7), and because governments recognize its importance for the conservation of patrimony, including indigenous ritual, ecological and technological knowledge from across the continent. But, above all, ethnoarchaeology is recognized as a discipline worth practicing for its contribution to the understanding of both present and past, an understanding necessary to move forward into the future, and to produce research that is relevant to Africans. We leave to other areal specialists the task of establishing whether similar phenomena are taking place in other parts of the world.

Conclusions

This paper has answered Olivier Gosselain's (2011, 2016) ill-informed and provocative charges against ethnoarchaeology and shown that, far from being the wreck he supposed, it is an active, theoretically informed, methodologically sophisticated subdiscipline that contributes to anthropology and related disciplines in many ways. Why then, the reader has surely asked, does Gosselain wish "to give the wreck one last kick to sink it once and for all"? First, it seems, because, although he received training in archaeology, he is not an archaeologist and does not fully appreciate the importance of ethnoarchaeology's contribution to its mother discipline. Second, he believes ethnoarchaeology is attempting to reinvent (or subvert?) material-culture studies and his specialty, the anthropology of techniques. Ethnoarchaeologists freely admit the linkage and benefit from such relationships, but surely we have the right to assort together if we so wish and to publish in archaeological journals or *Ethnoarchaeology* rather than in say, the *Journal of Material Culture*.

Following Hamon (2016, 700), we regard this paper as exemplifying "the marked tendency towards the self-criticism of [ethnoarchaeology's] practices and the validity of its scientific contribution". We believe as she does that

the practice of ethnoarchaeology aims ... to shift the gravity of western-centric approaches in social anthropology towards other perceptions of materiality and of what it means and reflects ... Thus, ethnoarchaeology can justifiably be seen as an approach that is eminently and intrinsically ethical.

It is a viable subject of study at the undergraduate and graduate levels with practitioners that are both increasingly productive and, in Africa and elsewhere, increasingly diverse as substantial numbers of non-Westerners become practitioners of the sub-discipline. The rich documentation presented in this paper supports Hamon's and our claims and introduces practitioners and students alike to recent developments in theory, scope and topics. It offers multiple choices for the reader's and the subdiscipline's future.

Amongst all the topics to which ethnoarchaeology might make a critical contribution we single out the conceptualization of matter itself. Andrew Jones (2015, 325) contrasts two views of the world. In the first,

materials that have been culturally worked can act as a form of evidence for that past activity ... [which] can only occur when we perceive materials as distinct from culture and society. This characterisation of materials ... place[s] the interpreting subject at the centre of our analyses.

Such a viewpoint is the outcome of a dualism rooted in the philosophy of Descartes and other Enlightenment thinkers. In an alternate view of the world, Jones follows philosopher of science Barad (2007) in arguing that

there are no unambiguous methods of differentiating between an "object" and the "agencies of observation" used to examine that object. Observations of the world do not simply represent the world; they help to bring the world into being ... Materials are constituted by human observation and interaction, a process she describes as "agential realism".

Such a standpoint, Jones argues, takes a monist rather than a dualist perspective. The argument, both complex and subtle, cannot be detailed here. But what a splendid challenge for ethnoarchaeologists, equipped and eager to engage deeply with humans and their material

culture, to evaluate alternate ontological models, one Cartesian deriving from the macroscopic world, the other monist from the quantum realm. Is it more fruitful to perceive material culture as offering multiple affordances or in terms of “agentive realism” and “intra-action”, or is there perhaps a middle, “subtle dualist”, way?

A final thought: *archaeologists who practice ethnoarchaeology become better archaeologists*. For example, a wide range of Mandara Mountains cultural practices studied by ethnoarchaeologists over a quarter century informed both the excavations and interpretation of the unique set of DGB monumental sites (David 2008). And because we focus on the *thing* as well as the *word* we become better anthropologists in the broader sense, whether we are contributing to archaeology, ethnohistory, economics, medical anthropology, development studies, cultural heritage, politics, or are engaged in activism. Ethnoarchaeology benefits the social sciences and has been and continues to be a vigorous contributor to their endeavors.

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