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COLD WINTERS, HOT SOUPS AND FROZEN CLAY

Understanding the Adoption of Pottery Traditions into the Circumpolar North

Peter Jordan and Kevin Gibbs

1.1 INTRODUCTION: THE PUZZLE OF CIRCUMPOLAR CERAMICS

Living in the colder, higher latitudes of the earth has always been difficult, and must have been even more so in prehistory. The combination of harsh environments, strong seasonality and associated risks and uncertainties created many fundamental challenges that humans had to cope with (Rowley Conwy 1999). Despite these obstacles, humans were already making forays into parts of the Eurasian Arctic as far back as 30,000 years ago, and by the end of the Pleistocene had established footholds in the most northerly parts of the Old World. In contrast, apart from Alaska, settlement of higher-latitude North America was delayed by the slower pace of deglaciation. Finally, by around 4,500 years ago, humans had established a chain of circumpolar settlement that spanned the globe, and now included High Arctic Greenland (Friesen and Mason 2016; Hoffecker 2005).

To survive, communities needed to make sure that they were in the right place at the right time of year and that they had the right equipment; circumpolar environments – especially coastal and maritime ecosystems – could potentially offer abundant food and fuel resources. But these resources were often available only during narrow windows of opportunity in the annual cycle. People either needed to move constantly between available food sources or use surplus that they had stored up in one season to deal with the shortfalls

that followed in the next. Sharp inter-annual fluctuations in the size of animal populations added further pressures, as did the repeated environmental shifts caused by fluctuating climates. Finding effective ways to cope with these multiple risks defined the routines of local existence. Survival strategies emerged slowly through the gradual amassing of appropriate skills and knowledge; this cultural repertoire could then be refined, expanded and passed on from one generation to the next.

Such skills and knowledge meant that prehistoric cultures not only survived across the Circumpolar North, but frequently flourished. This involved both demographic expansions into uninhabited areas, as well as absorption or replacement of other cultures. However, these periods of accelerated growth and development were frequently interspaced with long periods of deep continuity, as well as sudden contractions, disappearances and repeated abandonments of remoter regions, especially in the High Arctic. Much of this relentless cultural dynamism appears to stem from the complex intersections between shifting climates and environments, the strategies used for procuring available resources and associated shifts in demography and wider interaction networks. On the ground, these pressures sometimes resulted in communities switching from living in fluid social bands that were highly mobile, through to aggregating into larger, settled communities that were committed to inhabiting specific places. The fragility and resilience exhibited by these circumpolar cultures is what makes the prehistory of the Circumpolar North so interesting; it has some of the most dynamic sequences of human cultural development on the entire planet (Friesen and Mason 2016; Maschner 2015).

From the very moment that humans expanded into northern areas, the use of technology – that is, the cultural knowledge needed to produce and use tools, objects, equipment and other material culture – was absolutely central to existence, both for daily survival, which inevitably required exploitation of wild resources for non-agricultural foragers, but also in the conduct of wider sociocultural and spiritual life. Over time, important new material innovations emerged across the North, while others were adopted from adjacent areas. The centrality of sophisticated tools and equipment to northern lifeways makes the study of technological traditions of central importance. Careful reconstruction of how new skills, tools, knowledge and equipment were created, used and shared, offers archaeologists an ideal entry point into a constellation of interconnected research themes, ranging from ecology, adaptation and human–environment relations, through to technological practice, cultural inheritance and the negotiation of gender and other social identities.

This book deploys exactly this kind of approach; it aims to improve current understandings of one of the most intriguing elements of the northern hunter-gatherer technological repertoire: *pottery*. This is defined as ceramic cooking and storage containers made from fired clay. The prehistoric use of pottery was a

recurrent – but somewhat later – feature of human life across most of the Circumpolar World; at times it was being made and used well above the Arctic Circle (Jordan and Zvelebil 2009), but unlike the lithic traditions that had been there with the first pioneers, the first use of pottery *post*-dates the earliest human settlement of the North. In other words, people had survived for many millennia across the Northern World without ever having known or used pottery. The main question is therefore, what features or benefits of pottery technology made it so attractive, and why was it so widely adopted? To understand this process we need to go further back in time.

These enigmatic northern pottery traditions emerged first in the archaeological record of Northeast Asia at the end of the Pleistocene, just *before* the world emerged from the final sharp fluctuations in climate that marked the end of the last Ice Age. By the mid-Holocene, use of ceramic container traditions had been adopted by hunter-gatherer cultures living across much of northern Eurasia, and were also spreading up into sub-Arctic North America; in most areas, these pottery traditions persisted for hundreds of generations, and in many areas, until European colonial trade networks started to offer access to alternative metal container technologies.

That prehistoric foraging cultures were even using pottery so far north often comes as a surprise to many archaeologists; the presence of ceramics in cold, seasonally frozen landscapes seems simply odd and out of place. For this reason, the complex history of northern pottery traditions has generally been glossed over, and remains under-researched. This is a lost opportunity. In fact, two primary factors have contributed to the enigmatic status of northern pottery. The first is an implicit assumption: compared to many other types of containers, pottery is relatively heavy and fragile, and its use has long been associated with settled farmers, not mobile hunter-gatherers (e.g., Barker 2006: 15). Higher-latitudes were inhabited by prehistoric foragers – not by village-based agriculturalists – and so the use of pottery by these early northern societies seems counterintuitive.

The second reason is much more explicit: as soon as the widespread existence of northern pottery traditions is acknowledged, their dispersal and adoption into Circumpolar ecosystems becomes even more puzzling. This is because pressing environmental constraints at higher latitudes mean that every step of the pottery manufacturing process must have been very difficult, or at least very costly in terms of skills and effort. This alone makes the study of northern pottery all the more interesting – clearly, time was being invested in securing all the necessary resources, ranging from clay sourcing through to gathering fuel for the firing. Moreover, cold northern winters meant that pottery-making must have been a summer craft, but this season can also be one of the busiest times in the annual cycle for obtaining and processing vital food supplies that need to be stored up for the forthcoming winter. Somehow,

pottery-making had to be fitted in alongside all these other pressing tasks. Importantly, pottery technology was also a later cultural phenomenon; it was adopted into a Northern World that had long been settled by diverse foraging cultures. These communities had already developed effective ways of surviving in the North. While none of these survival strategies required pottery, many involved using other cooking and container technologies such as griddle stones, boxes, bags and baskets.

Clearly then, something vital and compelling was making pottery technology attractive to prehistoric northern societies. This enduring value – or specialized function – was so important that it eventually overcame all the high costs and practical challenges of making pots in the North. As this complex acceptance process played out, strategic choices and trade-offs must have been made among individuals living in each and every community. Pottery offered benefits, but maintaining it as an intergenerational cultural tradition demanded that it had to be aligned with all the other preexisting practices, obligations and seasonal activities, all of which competed for available time and effort (see Harry and Frink 2009, Harry et al. 2009).

In this way, the study of northern pottery potentially offers much more than simply mapping arrival dates onto dispersal maps, or even the chance to study how the ceramic craft was integrated into local routines and practices. Some of the most interesting insights start to emerge by examining how the adoption of pottery into the wider technological and sociocultural repertoire of northern societies had cumulative impacts, perhaps reinforcing emerging cultural trends, or even triggering long-term cultural transformations. For example, early pottery adoption may have created positive feedback loops by offering improved ways to process, store or serve specific resources in new kinds of containers, or in greatly increased quantities. This may have prompted further innovations in pottery design and usage at the same time that the new technology was itself transforming opportunities for local social interactions and wider cultural life. The playing out of these increasingly entangled histories could plausibly have unleashed powerful sociocultural dynamics that gave rise to new cultural possibilities.

Beyond the basic time–space patterns in the arrival of pottery into the Northern World, most of these vital questions about how and why pottery was integrated in northern lifeways, and the cumulative impacts of its adoption, all remain poorly understood. This lack of knowledge also creates a timely and exciting opportunity for archaeologists to muster current data, and to mobilize theory, new methods and comparative insights from ethnographic and experimental studies in order to better understand these intriguing adoption and innovation dynamics. In so doing, it should be possible to explore some of the decision-making processes and illuminate complex cultural and environmental influences that that lay behind them. The goal of this

book is to address this gap; it undertakes the first in-depth comparative and contextual investigation of perhaps the most intriguing dimension of all hunter-gatherer pottery use: its dispersal into the Circumpolar North.

1.2 WIDER RESEARCH CONTEXT AND CENTRAL QUESTIONS

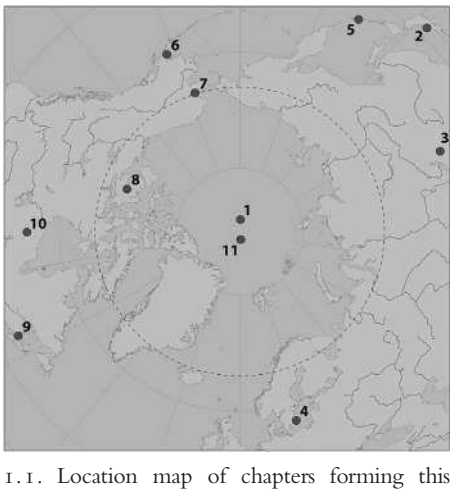
In the last ten years the role of prehistoric hunter-gatherers in the emergence and wider uptake of pottery has seen a fundamental reappraisal (Anderson, Tushingham and Buonas 2017; Frink and Harry 2008; Gibbs et al. 2017; Hommel 2014; Jordan and Zvelebil 2009; Jordan et al. 2016). As part of this revisionist history, foragers in China, Japan and the Russian Far East are now accepted as the innovators of the earliest pottery, which emerged in East Asia around 20,000 years ago. After the onset of the Holocene, hunter-gatherers living in a long arc that stretched from Arctic Norway and the Baltic through to Chukotka in Northeast Siberia, had all acquired and were maintaining vibrant pottery-making traditions. After 3000 BP, knowledge of the tradition was spilling over the Bering Strait into Alaska (see Chapter 6; Anderson et al. 2017).

Clearly, pottery was not brought into the Circumpolar North by the first human colonists; they had arrived much earlier, and so pottery must have spread via some kind of dispersal and adoption process. However, the extent to which this represented a single giant dispersal wave that originated first in East Asia and spread across Siberia and into northern Europe, or more complex patterns of localized invention and adoption remains unclear, and needs a comprehensive dating program to resolve (Jordan et al. 2016). Either way, in the rest of northern North America, a slightly different pattern played out: beyond Alaska, pottery was invented independently far to the south, and was then accepted into northern hunter-gatherer cultures during the Woodland Period (see Boyd et al.; Deal et al., this volume). Despite the diversity of these dispersal processes, the global adoption of pottery into higher latitudes generates several central questions:

- *What motivated the northern adoption of pottery traditions?*
- *What was the pottery used for?*
- *How was production and use of pottery integrated into seasonal routines?*
- *Why was pottery chosen over other rival cooking containers?*
- *What longer-term impacts were associated with the adoption of pottery?*
- *How did pottery traditions change over time?*

1.3 STRUCTURE OF THE BOOK

The book is organized so that chapters map onto the general history of pottery adoption into the Northern World (Figure 1.1): (a) the first set of chapters are



1.1. Location map of chapters forming this book: (1) research context: understanding the dispersal of pottery traditions into the Circumpolar North (Jordan and Gibbs); (2) early hunter-gatherer pottery in Japan (Uchiyama); (3) early pottery in Eastern Siberia (Vetrov and Hommel); (4) prehistoric pottery traditions, collective identities and cuisine among maritime foragers (Isaksson et al.); (5) use of pottery by maritime foragers in the remote Kurils Islands (Gjesfjeld); (6) understanding the function of container technologies in Southwest Alaska (Admiraal and Knecht); (7) archaeological and ethnographic perspectives on the use-life of pottery in Northwest Alaska (Anderson); (8) comparative analysis of pottery and soapstone cookware technologies in the North American Arctic (Frink and Harry); (9) investigating the function of prehistoric forager pottery in the Maritime Provinces (Deal et al.); (10) prestige foods and the adoption of pottery by subarctic foragers (Boyd et al.); (11) conclusions and research outlook: explaining the use of pottery among Circumpolar hunter-gatherers (Hayden).

set in northern Eurasia, and include Late Pleistocene and Early Holocene sites with very early traditions (Japan, Siberia); this section also includes case studies of later pottery assemblages dating to the mid-Holocene (Baltic; Kuril Islands); (b) the next set of chapters examines the later pottery traditions that had crossed over into the New World; these case studies are set in Alaska, the Aleutian Islands and in the Central Canadian Arctic; (c) two further chapters are set in Maritime and Sub-Arctic Boreal Canada and examine pottery traditions that likely had more southerly influences and (d) the final chapter undertakes a critical review of progress on northern hunter-gatherer pottery and highlights key themes for future research.

1.4 EMERGING INSIGHTS INTO NORTHERN CERAMIC TRADITIONS

Given that the oldest pottery was found in Japan and other adjacent regions of East Asia during the Upper Palaeolithic, the chapter by Junzo Uchiyama marks a useful point of departure for the rest of the book's case studies. It is important to develop this kind of baseline understanding of how this very early pottery was being used, and how it evolved and changed over time, before we start to explore how it was being employed at later dates in areas located further to the north.

The key question addressed by Uchiyama is what were the socio-economic contexts in which this very early pottery was innovated in Japan during the very cold conditions at the end of the Pleistocene? Uchiyama focuses primarily on the waterlogged Torihama site, and uses exceptional faunal and other important contextual data to explore the long-term trajectories of pottery use across the Pleistocene–Holocene transition, which was defined by major climatic and cultural transformations. In the very coldest phases of the Late Pleistocene, the first very limited numbers of small pottery vessels (small bowls that could be held in one hand) were just starting to appear at the site, which probably functioned as some kind of seasonal camp

for residentially mobile foragers. Later, the site saw a major take off in pottery use during the Early Holocene, which has traditionally been linked to the shift away from hunting large game at the Pleistocene–Holocene transition, and towards the development of intensive fishing activities in the warmer conditions of the Holocene.

Importantly, Uchiyama is able to identify that diverse aquatic resources were *already* being exploited at the site in the cold conditions of the Late Pleistocene. The earliest pottery vessels were likely used to process some of these aquatic resources – probably hot and oily fish soups – which were consumed only during specialized ritual activities. In contrast, he argues that the wider Early Holocene "take-off" in pottery probably represented a qualitative shift from pots being used on these rare and highly ritualized occasions, towards becoming general purpose cooking and serving vessels (the later types are larger in volume and much more varied in style). Interestingly – and despite this shift – the close cultural association between pottery and the processing of aquatic resources endures for many subsequent millennia (see Craig et al. 2013, Lucquin et al. 2016).

V. M. Vetrov and P. N. Hommel also focus on early pottery assemblages in their chapter, this time on the Ust' Karenga complex of sites in Eastern Siberia, which date to the Late Pleistocene. They highlight the need for in-depth studies of key sites and assemblages and through detailed archaeometric analysis of the earliest pottery assemblage found at the site, they are able to suggest that it was being used by highly mobile foraging groups, who exhibited few signs of social complexity; moreover, these groups probably carried the precious ceramic vessels with them as they moved between established camping sites located in different places in the landscape. These early pots have thin walls and were probably used for direct heating of contents over open fires. These insights tend to contradict the common assumptions that only complex hunter-gatherers (exhibiting a degree of sedentism) would start to develop or adopt pottery, and that pots would have been made and cached at seasonal agglomeration sites. Interestingly, there appears to have been no experimental stage at the sites, and adoption of pottery seems to have taken place as an already developed craft, and was then able to fit easily within this nomadic lifestyle. Certainly, there are no indications of wider transformations taking place at the point of its uptake; in fact, there is deep continuity in the lithic traditions both before and well after its arrival. Likewise, after the pottery tradition is adopted it seems to undergo no further innovation; it remains remarkably similar for many generations. In testing many basic assumptions about early northern pottery, these results are important, and signal that much more work needs to be done at early sites and ceramic sequences to map out the full diversity in its adoption and integration into preexisting lifeways.

The next chapter by Sven Isaksson, Kevin Gibbs and Peter Jordan shifts the focus to the opposite end of the continent and to later periods, by which time

a larger horizon of hunter-gatherer pottery use is now spanning northern Eurasia (Jordan et al. 2016). The enigmatic Pitted Ware Culture (PWC) is a hunter-gatherer pottery tradition that is concentrated in the coastal areas of eastern central Sweden, and may form the westernmost extension of a wider dispersal/adoption phenomenon. For example, it has little technological affinity with Funnel Beaker (TRB) pottery, which is also in use in the area, and was brought from the south with the spread of Neolithic farming communities. Focusing primarily on the period between 3600–3300 cal BC, this chapter paints a vivid portrait of highly mobile communities of "sea nomads" who moved constantly between a network of fixed landing sites. Here they produced and deposited the distinctive PWC pots, often in massive quantities. Archaeologically, these landing sites tend to be dominated by fish and seal bones, and frequently include human burials and other ritual objects. Large-scale organic residue analysis of the pottery across diverse sites indicates that the striking differences in PWC and Funnel Beaker or TRB pottery technology is mirrored, at least in the early PWC phases, with an equally distinct function: PWC is used to process aquatic resources, mainly sea mammals (probably seal), whereas TRB has other uses, including preparation of dairy products. Moreover, isotopic analysis of human remains recovered from both PWC and TRB sites indicates a similarly sharp differentiation into reliance on a marine versus terrestrial diet. These hunter-gatherer versus early farmer communities also exhibit sharp genetic/ancestral differences and origins.

The authors argue that this PWC pottery phenomenon reflects the emergence and maintenance of a very separate hunter-gatherer identity: these PWC communities lived as highly mobile coastal foragers; their distinct pottery style and function reflects deeper food cultures and culinary traditions that focused on exploitation of sea mammals. The capacity to maintain and communicate a distinctive identity in this way played an important role in these complex, multicultural forager–farmer interaction zones.

The next chapter by Erik Gjesfjeld maintains the focus on maritime foragers, but jumps back across to insular Northeast Asia, to examine the paradox of pottery use in the remote Kuril Islands of the North Pacific. Here, between 3,700 and 500 years ago, local foragers maintained an enduring pottery-making tradition despite substantial environmental constraints, including limited clay resources, lack of firewood and damp and foggy weather, even in the summers. Interestingly, Gjesfjeld is able to study the design and role of pottery over time, and argues that the local technology undergoes a major shift between the Epi-Jomon and later Okhotsk Culture: in the former, pots walls are thinner and mineral tempered, potentially indicating direct heating and general cooking; in the latter, vessels are flat-based, thick-walled and were probably used in combination with stone boiling to render precious marine fats and oils. These may indicate a general shift from routine cooking of local aquatic resources for local subsistence, towards a much more specialized production of marine

mammal fats and oils, which may have been used by the Okhotsk Culture as a valuable trade resource, enabling them to participate in wider regional exchange networks that spanned Northeast Asia (see also, Fitzhugh et al. 2016 for a wider discussion). This case study is important because it highlights the enormous "potentiality" of the pottery craft, and that the designs, roles and functions of northern ceramics were not fixed or predetermined but could, through local innovation, change dramatically over time.

The next set of chapters takes us over to the North American side of the North Pacific, where we start to see how acceptance of pottery "competed for space" alongside other food preparation technologies, such as stone bowls and griddle stones. Marjolein Admiraal and Rick Knecht develop this intriguing theme by tracing the divergent evolution of early container technologies in the Aleutian Islands and across various regions of Southwest Alaska. For example, in the Aleutians, use of stone bowls gives way to use of griddle stones but pottery is never adopted; sequences in mainland Southwest Alaska and the Alaska Peninsula undergo a major shift in technology and style between the Norton Palaeoeskimo (Palaeo-Inuit) Culture and the Thule Neoeskimo (Neo-Inuit) period, while Kodiak Island sees a much later adoption of pottery.

Whatever the exact technology deployed, each must have required choices about whether to invest skills and labor. A better understanding of vessel function may provide the key to unlock these localized developments; the authors highlight that little is known about the exact function of the different vessels, and that more analysis of organic residues will be needed to expand insights generated by earlier pilot studies (see e.g., Farrell et al. 2014; Solazzo and Erhardt 2007). However, the widespread use of marine fats, oils and blood in vessel construction and as a way of sealing fired pots prior to use may make interpretation of the organic residues difficult as preserved residues may reflect production methods rather than later usage.

More generally, the general pattern they identify across this vast area is that these diverse container technologies emerge primarily in coastal areas, and coincide in time with an apparent intensification of the marine hunting economy; this also seems to correlate with increases in seasonal or permanent sedentism, following many popular assumptions about pottery being compatible with settled forager communities undertaking mass harvesting of seasonal resources. However, there are also many intriguing spatiotemporal gaps in the distribution of pottery traditions that need more research to properly document and explain. Clearly, there is much research still to be done here.

The chapter by Shelby Anderson remains in Alaska, but moves further to the north, and examines pottery traditions in Northwest Alaska. She adopts a slightly different approach to understand the emergence of pottery traditions. She argues that here – as in many other areas of the North – the general time/space patterns of pottery traditions are already known in general outline, and in

many cases, this is where scholarship has been parked in recent decades. She argues that trying to explain and understand the deeper role of these traditions requires a means to deliver contextual insights into how it was embedded into the routines of daily life, from production, and through use and exchange.

To make progress on these important themes, she deploys a "use life perspective" to understand how sourcing, production, use and discard were integrated into other seasonal activities and combines archaeological and ethnographic data. Her results overthrow many common assumptions about northern pottery, for example, that clay sources are widespread, and that potters would always use the nearest sources. In fact, she uncovers substantial exchange of the raw clays between sites and regions, and also discovers that finished pots were being moved widely as well (see also, Vetrov and Hommel).

More generally, she follows other chapters in identifying a close association between pottery and marine resources but, again, uses of fats and blood in production may make it difficult to interpret results of residue analysis and resolve discussions about function. This is a pity as the technological and functional roles of many of these vessels are still rather unclear. More widely, her approach uncovers variability in roles and uses, and shows that making and using pottery in the North was always a difficult craft involving both high levels of investment, but also the persistent substantial contribution of culturally informed choices along the way.

Liam Frink and Karen Harry move the focus further to the east – to the Central Canadian Arctic. Crucially, they bring debates back to the choices and strategies that lay behind the adoption of rival container technologies (see also, Admiraal and Knecht), and seek to resolve the enduring puzzle of why pottery prevails in the western part of this zone, and soapstone bowls in the east, with some areas of geographic overlap in the middle. This pattern developed despite the common underlying economic reliance on sea mammals, fish and some land mammals for basic subsistence.

This chapter systematically tracks how a matrix of factors – ranging from environmental variability, seasonality and clay and fuel availability – can subtly influence the costs and benefits of each rival technology for communities inhabiting different parts of this large region. They also explore how pottery and soapstone compare in terms of engineering principles and performance characteristics. This approach uncovers three key insights: (a) pottery was favored in the West because there was more driftwood, people were more settled and less soapstone sources were available – here, clay cooking pots had an array of advantages; (b) in the East, communities were more mobile, less fuel was available and soapstone quarries were located close by – this alternative solution fitted better with these needs and constraints, giving this technological system strong advantages; (c) even more intriguing are the areas where