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Immovable food storage facilities, knowledge, and landscape in non-sedentary societies: Perspectives from northern Michigan



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ABSTRACT

Physical food storage in immovable facilities, typically categorized as large-scale storage, is used as a scarcity mitigation strategy by some small-scale, relatively low density, non-sedentary hunter-gatherer (and low-level horticulturalist) societies. When mobile societies rely on immovable food storage facilities, they face particular technological and landscape placement challenges that must be navigated to reduce the risks of facility failure and realize scarcity mediation. We explore how the materiality and spatial positioning of immovable food storage facilities themselves can encode knowledge necessary for these facilities to form a reliable food storage system. We suggest immovable food storage facilities be understood as emplaced features, that is, as features whose placement in the landscape is the result of, but also subsequently the producer of, socioecological knowledge. We explore these ideas through a case study in the northern Great Lakes region. During the Late Precontact period (ca. AD 1000/1100–1600), socioeconomic shifts pushed communities into increasingly spatially and seasonally restricted annual mobility rounds. The region's relatively low density, egalitarian, non-sedentary hunter-gatherer-fisher and low-level horticulturalist societies turned to physical food storage in immovable facilities, in the form of subterranean cache pits, to circumvent the risks posed by socioecological variability. Exploring one inland lake landscape in detail, we find cache pit storage facilities were purposefully planned and built in ways that successfully navigated the technological and landscape placement challenges of immovable food storage in this specific setting. We found the enduring presence and use of these immovable food storage facilities in the landscape encoded and transmitted knowledge about sustaining successful food storage across spatially and temporally dispersed groups. Cache pits were emplaced features that served to enhance community well-being in the increasingly restricted socioeconomic context of Late Precontact.

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1. Introduction

Storage, “or the setting aside of material things (food, tools, water, seeds for plants) for some future use – whether short or long term – is a fact of economic and social life in all cultures, at all times and in all places” (Halperin, 1994:167). While any number of materials can be stored, the storage of food is a particularly significant practice. Societies must respond to environmental and/or cultural variability that can lead to severe and unpredictable scarcity in vital resources, of which food is one of the most (Halstead and O’Shea, 1989:2). Food storage is one key response to mitigating against scarcity and societies practice different forms of food

storage given the specific stressors they face (Brenton, 1988). Three main forms of food storage include: (1) physical storage, (2) biological storage as fat on one’s body, and (3) social storage through exchange relationships (Morgan, 2012:715; similar groupings iterated in Halstead and O’Shea, 1989; Ingold, 1983; Soffer, 1989).

In anthropological and archaeological research, physical food storage was first understood as a response tied to the emergence of social stratification – economic specialization produces food surplus, storage is intensified to accommodate and extend surplus, sedentism increases, and ultimately some members of society come to control more of the surplus than others, precipitating the classic shift defined by Sahlins (1972) from a Domestic Mode of Production to a public economy. This scenario has been studied in the rise of farming-based chiefdoms and states and has also been documented among complex hunter-gatherers

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constituted primarily of oceanic coastal-adapted hunter–fisher societies where predictable and abundant wild resources stand in for agricultural products (Keeley, 1988:373–4; cf. Ames, 1994, 2003; Arnold, 1996; Fitzhugh, 2002; Grier et al., 2006; Koyama and Thomas, 1981; Sakaguchi, 2009; Testart, 1982).

With such linkages between physical food storage, sedentism, and increased (and eventually, permanent) inequality, if, and if so, why, when, and how egalitarian, relatively low density, mobile hunter–gatherer–fisher (and low-level horticulturalist) societies practiced physical food storage became a topic of debate in the 1980s (Binford, 1980; Halstead and O’Shea, 1989; Ingold, 1983; Rowley-Conwy and Zvelebil, 1989; Soffer, 1989; Testart, 1982). Some early research emphasized the importance of social storage based on the pooling of risk through social obligations to be “cashed in” in times of future resource scarcity in such societies (Cashdan, 1985; Goland, 1991; Jochim, 1981; Spielmann, 1983; O’Shea, 1981; Wiessner, 1982). These systems of social exchange appeared better suited to mobility than physical food storage. However, now classic studies by Ingold (1983) and Binford (1980) made it clear that mobile hunter–gatherers could also, and did, regularly practice physical food storage.

Scholarship on physical food storage in the adaptations of relatively low density, mobile hunter–gatherer–fisher (and low-level horticulturalist) societies has, accordingly, expanded (Cunningham, 2011; Dunham, 2000, 2009; Frink, 2007; Kuijt, 2009; Morgan, 2012; O’Shea, 1989a; Rowley-Conwy and Zvelebil, 1989; Soffer, 1989; Stopp, 2002; Tushingham and Bettinger, 2013; Whelan et al., 2013). This research has made it clear that physical food storage in such societies is not some kind of prelude to complexity but an “important practice in its own right with both practical and social meaning throughout prehistory” (Cunningham, 2011:143). This ongoing research shows physical food storage practices are also dynamic and varied, and so can defy easy categorization.

Portable storage (e.g., pemmican) and caches appear especially widespread in egalitarian, non-sedentary societies and these practices tend to be grouped under the rubric small-scale storage, contrasted with large-scale storage involving advanced preservation techniques and immovable facilities (i.e., granaries) (Cunningham, 2011: 137). However, portable storage and caching can occur in different ways and on vastly different scales. Non-sedentary hunter–gatherer–low-level horticulturalist societies can come to cache large quantities of food resources (Stopp, 2002:314–5) and do so in immovable facilities (Simms, 2008:227–8). We are interested in cases where physical food storage in mobile societies involves such practices typically categorized as large-scale storage. Specifically, we ask, what are the technological and landscape placement challenges mobile hunter–gatherer (and low-level horticulturalist) societies have to navigate when they use immovable food storage facilities? And following, what impact does navigating these challenges have on social, economic, and ideological processes?

We provide a case study of the use of immovable food storage facilities by mixed forager–fisher–horticulturalists in the northern Great Lakes region during the Late Precontact period (ca. AD 1100/1200–1600). During this period, the region witnessed an intensification of extant subsistence practices (fishing and foraging) and a rise in maize horticulture in preferential climactic settings locally; these subsistence shifts resulted in increasing spatial circumscription (O’Shea, 2003). Across the region, communities found themselves engaging in their annual mobility rounds within more spatially and socially restricted territories. With the (wild and cultivated) resource base of the region being both seasonally variable and unpredictable year-to-year, the reduction in the spatial range communities could exploit to harvest food

resources heightened the risk of experiencing food scarcity. The need to both maximize and extend the use-life of local food abundances became critical.

Communities invested in physical food storage in immovable storage facilities in the form of cache pit (subterranean food storage) clusters dispersed from residential sites to respond to the novel mix of social and ecological stressors they faced in Late Precontact (Dunham, 2000; Holman and Krist, 2001; Holman and Lovis, 2008; Howey, 2015). Exploring cache pits in detail in one inland lake landscape, we examine the technological, social, and spatial challenges presented by relying on and constructing immovable food storage facilities here, and how, in answering these challenges, people, and their knowledge, became evermore committed to each other and to their landscapes, connections increasingly important to well-being in the context of Late Precontact.

2. Immovable food storage facility challenges in non-sedentary societies

In any society, responses to unpredictability and potential food scarcity have to balance needs for long-term security and day-to-day operating efficiency (Halstead and O’Shea, 1989:5). When physical food storage is used to extend food supply to help create security, it takes an investment of time and labor diverted from daily activities critical to efficiency (Morgan, 2012: 717). In larger-scale societies there are structures in place for pooling labor without compromising daily operations, but such a diversion of time and labor in relatively low-density, egalitarian, non-sedentary societies carries the potential to impact efficiency (Trigger, 1990). Groups have to find ways to accomplish daily subsistence tasks while also collecting and processing extra food for storage (Whelan et al., 2013). Such shifting of social and material resources to physical food storage can also diminish the capacity to pursue other scarcity mitigation strategies. When physical food storage is developed as an adaptive strategy in relatively low density, egalitarian, non-sedentary hunter–gatherer–low-level horticulturalist societies, there is pressing need for high rates of success to accommodate these opportunity costs.

When non-sedentary societies rely on immovable facilities for their physical food storage practices, costs and risks are intensified. Fixed food storage facilities can require not just more time and labor than other forms of physical food storage, such as portable storage, but they present heightened chances for front-end costs to be completely wasted due to storage facility failure where stored food is not consumed (O’Shea, 1989a; Tushingham and Bettinger, 2013). With portable storage, foodstuffs travel with those who produced them (Stopp, 2002). With immovable food storage facilities in mobile societies, cached food is fixed and so there are episodes of varied duration where stored foods are separate from the people who constructed and filled the facilities. A suite of factors can readily lead to immovable food storage facility failure. Non-sedentary societies must grapple with these challenges.

Immovable storage facilities can fail *technologically*. For immovable food storage facilities to serve any role in mediating scarcity, the technology of them must be sufficiently developed such that they actually preserve foodstuffs over time (Minc and Smith, 1989:10). Immovable storage facilities, both above ground and subterranean, can fail structurally, breaking down/falling/collapsing and destroying contained food. Ubiquitous elements can cause contained food to rot – water, light, heat – making rot a constant threat to storage failure that must be minimized by the technological attributes of immovable food storage facilities in any setting.

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