Journal of Anthropological Archaeology 31 (2012) 119–137

Contents lists available at SciVerse ScienceDirect

Journal of Anthropological Archaeology

journal homepage: www.elsevier.com/locate/jaa

Floor formation processes and the interpretation of site activity areas: An ethnoarchaeological study of turf buildings at Thverá, northeast Iceland

Karen B. Milek *

Department of Archaeology, School of Geosciences, University of Aberdeen, St. Mary's, Elphinstone Road, Aberdeen AB24 3UF, United Kingdom

ARTICLE INFO

Article history:
Received 12 August 2011
Revision received 2 November 2011
Available online 9 January 2012

Keywords:
Site formation processes
Activity areas
Space
Floors
Site maintenance
Ethnoarchaeology
Geoarchaeology
Soil micromorphology
Turf houses
Iceland

ABSTRACT

The importance of identifying activity areas on archaeological sites has focussed much ethnoarchaeological and geoarchaeological research on floor formation processes, especially the cultural practices and preservation conditions affecting the distributions of artefacts, organic residues, and elements. In order to broaden the understanding of site formation processes in northern regions, an ethnoarchaeological study integrating geoarchaeological methods was conducted at abandoned 19th- and early 20th-century turf buildings at the farm of Thverá, northeast Iceland. Micromorphological analysis of the floor deposits in different rooms, compared to the former resident's descriptions of how space had been used and how floors had been maintained, revealed that only a few activities resulted in the accumulation of residues that were diagnostic of how space had been used on a daily basis. Instead, floor layers were dominated by residues associated with maintenance events, such as the intentional spreading of ash, and the laying of fresh turf. This study highlighted the fact that "dirty", "clean", "comfortable", and "waste", are socially constructed concepts that have a significant impact on the composition of occupation surfaces and must be given careful consideration by archaeologists attempting to spatially analyse residues in floor deposits to interpret site activity areas.

Introduction

The interpretation of site activity areas, and the differentiation between the residues of the past use of space and other processes that may have affected the composition of occupation surfaces, is a key problem faced by all archaeologists who are engaged with research on settlement sites and are interested in how households organised their daily lives and economic activities. The methodological challenge of answering these questions is significant, because in the absence of obvious features such as hearths, cooking pits, storage pits or sleeping platforms, the interpretation of activity areas is normally dependent on a clear understanding of the agents and processes behind the observed patterns in the distributions of artefacts, microrefuse, organic residues, and/or elements that accumulated on presumed occupation surfaces (e.g. Metcalfe and Heath, 1990; Middleton and Price, 1996; Sampietro and Vattuone, 2005; Smith et al., 2001; Sullivan and Kealhofer, 2004; Vizcaíno and Cañabate, 1999). However, the composition of occupation surfaces is determined by variable and complex sets of interactions between a wide range of processes (Carr, 1984; Gé et al., 1993; LaMotta and Schiffer, 1999; Wandsnider, 1996). Most floor formation processes are cultural: intentional or accidental human actions that result in the deposition and/or removal of particular artefacts and residues – especially larger objects, which tend to be removed, dumped, redistributed or cached when activity areas or buildings are being cleaned or abandoned (Lange and Rydberg, 1972; Sakaguchi, 2007; Stevenson, 1982; Tani, 1995; Tomka, 1993). But there is also a range of natural processes that can alter the composition of occupation deposits with the passage of time, as they become subject to the same physical, chemical, and biological processes that affect local landforms and soils (Brink, 1977; Johnson and Hansen, 1974; Rolfsen, 1980; Schiffer, 1996; Stein, 1983; Wood and Johnson, 1978). It is therefore essential to develop a rigorous framework for detecting and interpreting activity areas – not merely for analysing spatial patterns in the composition of occupation deposits, but for detecting the possible palimpsest of cultural and natural floor formation processes that may also have affected this composition.

For over three decades, ethnoarchaeological, ethnohistoric and experimental studies of the formation processes affecting occupation surfaces have been making an important contribution to the development of methodologies used by archaeologists to sample, analyse, and interpret spatial data with relation to site activity areas (e.g. Bartram et al., 1991; Binford, 1978; Brochier et al., 1992; Deal, 1985; Fernández et al., 2002; Gifford-Gonzalez et al., 1985; Hayden and Cannon, 1983; Hutson et al., 2007; Murray, 1980; Nielsen, 1991; Simms, 1988; Shahack-Gross et al., 2003,

* Fax: +44 1224 272331.
E-mail address: k.milek@abdn.ac.uk

0278-4165/$ - see front matter © 2011 Elsevier Inc. All rights reserved.
doi:10.1016/j.jaa.2011.11.001

2004). Increasingly wary about the reliability of artefact distributions, especially artefacts over 1–2 cm in size, which are most likely to be removed during cleaning events or dumped or cached during abandonment events, the trend has increasingly been to analyse the spatial distributions of the most minute residues: microrefuse (bones and artefacts under 1–2 mm in size), phytoliths, organic residues, elements (especially P and Ca), and stable isotopes (especially N and C), and to use multiple overlapping datasets whenever possible (e.g. Fladmark, 1982; Metcalfe and Heath, 1990; Middleton and Price, 1996; Sanchez Vizcaíno and Cañabate, 1999; Sampietro and Vattuone, 2005; Shahack-Gross et al., 2008; Sherwood et al., 1995; Smith et al., 2001; Stein and Teltser, 1989; Sullivan and Kealhofer, 2004; Terry et al., 2004; Wilson et al., 2005, 2008).

Although most archaeologists are conscious of the fact that occupation deposits are commonly palimpsests, and may therefore be made up of the artefacts and residues of multiple, super-imposed events (e.g. Ascher, 1968; Carr, 1987; Kroll and Isaac, 1984; Malinsky-Buller et al., 2011), the most common method of sampling continues to involve scooping loose bulk samples into a polythene bag, which inevitably homogenises any super-imposed events and produces time-averaged results. In comparison to the analysis of artefact distributions or bulk samples, the taking of undisturbed block samples for impregnation with resin, thin sectioning, and micromorphological analysis with petrologic microscopes remains surprisingly rare, even though the ability of soil micromorphology to distinguish minute lenses (i.e. events) and changes in the composition of occupation deposits over time has been well attested since the late 1980s (e.g. Boivin, 2000; Courty et al., 1989; Davidson et al., 1992; Goldberg and Macphail, 2006; Macphail et al., 2004; Macphail and Crowther, 2007; Matthews, 1995; Matthews et al., 1997; Milek and French, 2007; Shahack-Gross et al., 2005).

Compared to more southern regions, particularly Latin America and the Near East, only a few ethnoarchaeological studies integrating geoarchaeological techniques have been conducted in the northern regions of Europe and North America, and these have focussed on the ability of multi-element analysis of soils to detect site activity areas (e.g. Knudson et al., 2004; Wilson et al., 2005, 2008). There has been a lack of ethnoarchaeological research on cultural and natural floor formation processes in northern regions, particularly in buildings constructed of turf or sod: the surface soil held together by the roots of grasses and other plants, which was the main building material until the mid-20th century in northern regions lacking good building timber. In addition to being abundant, and easy to cut and to build with, turf is an ideal construction material in cool northern climates due to its excellent insulating properties and the ability of living grass on the roof to absorb rain water and melting snow (Gestsson, 1982; Sigurðardottir, 2008; Urbanczyk, 1999). However, turf floor materials are subject to wear and turf walls and roofs are prone to degradation when they are penetrated by water and frost, and must be repaired regularly (Fenton, 1978, p. 110; and see below). In order to investigate cultural and natural site formation processes particular to turf buildings, and to develop an analytical and interpretive framework that would be relevant to a larger project on the use of space in Viking Age Scandinavian buildings (Milek, 2006), an ethnoarchaeological study integrating geoarchaeological methods was conducted on recently abandoned 19th- and early 20th-century turf buildings at the farm of Thverá (*Þverá*), in northeast Iceland.

The results of the ethnoarchaeological study at Thverá are presented here, beginning with general observations about the site formation processes associated with turf buildings: the residues that may become integrated into floor deposits during the building, use and repair of turf buildings, how turf buildings decay and collapse, and how they – and the floor deposits within them – ultimately become incorporated into the archaeological record. These general observations are followed by the results of a soil micromorphological study of the floor sediments in the main dwelling house and a sheephouse at Thverá, which permitted the composition of the occupation deposits to be compared to the former resident's descriptions of the original functions of the rooms and how their floors had been maintained. The discussion section assesses which activity areas at Thverá could be detected archaeologically, and compares the floor formation processes observed on this farm to those recorded in Icelandic ethnographic archives and in other world-wide ethnoarchaeological and experimental studies. This integrated study provides new insights into environmentally and culturally contingent space use and floor maintenance practices, with important implications for cross-cultural Middle Range Theory pertaining to floor formation processes and archaeological research on site activity areas.

The Study Site: Thverá, Laxárdalur, Northeast Iceland

The farm of Thverá is located in Laxárdalur in northeast Iceland (Fig. 1). The farm has recently been by-passed by the modern road system, but in the past it was in a favourable location at the crossroads of the main north-south route through the Laxá river valley, an important ford across the Laxá river, and the upland track that crossed the mountain of Hvítafell to the west (Olesen and Kjær, 1972). The 19th-century house that was the main subject of this study is located on top of a c. 2 m high artificial mound, which suggests a long settlement history on the site, but the mound has not been excavated, and the precise date of its foundation is not known. A burial that was accompanied by a horse, dating to AD 900–1000, was found at the southern border of the farm, and it is therefore likely that the farm has been occupied since the Viking Age (Eldjárn and Friðriksson, 2000, p. 204; Friðriksson, 1999).

The turf dwelling house at Thverá was built in 1852 and was continuously occupied until its abandonment in 1960, when the last residents of the house moved into a modern concrete building c. 70 m to the south. The house was then used in a limited way as a storage building until it was taken into the care of the National Museum of Iceland in 1965. At that time, the parts of the house that had fallen into disrepair (e.g. the smithy) were rebuilt, and the debris that had accumulated since abandonment was cleaned out. The farmer who had been born in the bedroom of the turf house in 1938 and who had lived there until 1960, Áskell Jónasson, was commissioned by the National Museum to undertake the necessary upkeep of the walls and the roof, but otherwise to disturb the house as little as possible. He laid fresh strips of turf over the earthen floors of the house in order to "make them nice" for visitors, which had the beneficial effect of sealing the floors and protecting them from further disturbance. Although the house is open to the public, visitation is low because the farm is far from a major road, and visitors have probably had a negligible impact on the house and its floor deposits. The likelihood that the floor sediments were well preserved, and the availability of a reliable informant who was willing to talk about what daily life had been like inside the turf house, made the site ideal for the investigation of floor formation processes.

Research methods

Field work was carried out over the course of 14 years, from 1997 to 2010, during which time numerous interviews were conducted with Áskell Jónasson, and he answered two questionnaires that further clarified issues related to the use of space inside the house and floor maintenance practices. A geoarchaeological sampling programme was conducted from 1997-1999, and visits to