



The archaeological signature of ‘ant bed’ mound floors in the northern tropics of Australia: Case study on the Lower Laura (Boralga) Native Mounted Police Camp, Cape York Peninsula

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ABSTRACT

Ant bed (also known as termite mound) floors were a common feature of historical buildings in colonial Australia, yet they are rarely identified in archaeological contexts. In this paper we present a case study of these features in buildings associated with a late nineteenth century Native Mounted Police camp in Cape York Peninsula, Queensland. Aboriginal colleagues reported the former existence of these floors in buildings at the site, though none could be seen at the contemporary ground surface. The question thus existed as to whether they were extant in subsurface contexts. Ground-penetrating radar revealed rectangular, high amplitude reflections in many parts of the site. Excavation demonstrated these features comprised stratigraphically discrete units that were highly compact, often with a substantial gravel component. Sediment analysis of the coarse-grained component has distinguished these floors from surrounding off-site samples. The level of compaction seen in the floors has significant implications for the retrieval of artefacts in such contexts since it prevents any objects from being integrated into the deposit. While the distribution of the practice of using ant beds for floors is unknown, it appears their use was common throughout Australia in the late 18th through the 19th and 20th centuries. Examination of the physical elements that make up these floors has provided a clearer idea of each floor's recorded history and use. We have also identified a methodology for examining ant bed floors in Australia and elsewhere that can be used anywhere that ant mounds occur and may have been a source of flooring material.

1. Introduction

In Australia there has been considerable historical research on the Native Mounted Police (NMP) (e.g. [Bottoms, 2013](#); [Richards, 2008](#)), yet very few studies have examined the associated material culture of NMP camps or their organisation, layout and construction. Such camps were an integral part of Queensland's frontier conflict during the 19th century, a time when a military style police force was used to eliminate Aboriginal resistance to white incursions. Despite some systematic steps towards understanding frontier conflict through archaeology (e.g. [Barker, 2007](#); [Cole, 2004](#); [Litster and Wallis, 2011](#)), little is understood about the built environment associated with police camps. Many such

camps were short-lived and therefore quite temporary, meaning that construction was basic and could consist of as little as canvas tents or open-sided bough shelters. Even longer-term camps (the longest lasting 25–30 years) typically consisted only of simple timber and iron structures, often roofed and walled with bark or grass (and sometimes iron sheeting) that could be easily dismantled, sold and/or re-constructed elsewhere for both expedience and frugality. Given that more permanent structures were uncommon at NMP camps, it is hypothesised that many of their living surfaces were probably earthen floors. In this paper, we present evidence that ant bed (also referred to as ant mound or termite mound) floors were used at the Lower Laura (Boralga) NMP camp, located in Cape York Peninsula, far north Queensland, and

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explore some of the archaeological consequences of their use, including their geophysical and archaeological correlates.

The Boralga NMP camp, established by 1876, was one of the longest operating NMP camps. While no excavations had been carried about at the site before our work in 2016, two previous reports which noted the existence of ant bed floors at Boralga were informed by highly skilled Aboriginal trackers: Jerry Musgrave and George Musgrave, both Kuku Thaypann speakers and Traditional Owners of the area now known as Rinyirru National Park. They also had connections to the site itself through their employment in the Queensland Police Force and the cattle industry (Cole et al., 2002). In 1972, Jerry Musgrave, then the police tracker at Laura, guided Ernie Stephens of the Cairns Historical Society to Boralga (Stephens, 1972). Here they found ‘old yard posts to take rails. Beyond were the old posts and ant bed floors’ (Stephens, 1972:1). In a subsequent community archaeology project (1999–2000), Dr. George Musgrave (1920–2006), who succeeded his elder brother Jerry as the police tracker at Laura and was a master tracker known for his remarkable ability to read the ground, identified a raised flat area near the eroded southern approach to Boralga lagoon as the remains of an ant bed floor likely to mark the location of the trackers’ (troopers’) huts (Cole et al., 2002:142, Fig. 3F). The initial Boralga fieldwork was preceded by a controlled burn conducted by Dr. Musgrave and the Ang-Gnarra Rangers, and ground visibility was relatively high. Burning was not conducted prior to our 2016 survey, which failed to identify ant bed floors at the ground surface: thus geophysics seemed the most appropriate method for identifying and mapping these features.

Earthen floors are made from various admixtures and are consolidated to form a hard surface. In Australia, earthen floors were being used as early as 1797 and were described as being composed of “trampled earth or packed clay” (Freeland, 1968:13). Many of these floors contained clay as a primary constituent and were watered regularly to keep them hard and reduce the dust associated with them (Edey, 1981; Lewis, 2014; Sorensen, 1911). According to Chauncy (1855:23), “the floor may be raised a little about the level of the ground outside, and a strip of broad paling placed all around to keep it in. It may then be covered with a coating of small broken stone, earth and wood ashes, which if occasionally sprinkled with water, becomes, in the course of a short time, almost as hard and complete as stone”.

The best earthen floor was constructed from crushed ant or termite mounds,¹ either trampled or puddled (i.e. crushed to a fine consistency, watered, and then beaten). Lewis (nd 3.06.04) noted what is possibly the earliest use of puddled ‘ant bed’ for flooring in Queensland in the 1850s. By the 1880s the use of this technique in building construction was well known in northern Australia (Lewis nd 3.06.03–3.06.04). In many ways, ant bed is a perfect flooring material, since the sediment is already very finely sorted and the insects produce excreta and saliva to bind the particles together. Historically, its durability and resilience made it particularly well suited to flooring kitchens, tennis courts, cricket pitches, dairies and smithies (“Eureka” 1935:10).

Ant and termite mounds are found throughout Australia. Termites initially form the mounds, but once they are abandoned they can be re-colonised by other ants, which means that mounds can be shared by different species. Unlike other species’ nests, termite mounds may be occupied for long periods, with their size increasing over time (Dostál et al., 2005). Termite mounds in far northern Australia are deemed ‘magnetic’ (*Amitermes laurensis*) since they are very large (> 1.5 m) and aligned north to south to minimise exposure to the sun and keep the interior relatively cool (Grigg, 1973). They continue to be enlarged by the addition of thin layers of galleries on the surface. Texturally, these mounds are composed of a range of soil types, often having a different texture and structure to the surrounding sediment (Eldridge and

Pickard, 1994). It has also been shown that ants can introduce foreign material, such as quartz grains, sandstone fragments, charcoal and twigs, to the mounds (Cowen et al., 1985).

While historical documentation on the construction of buildings at NMP camps is rare, ant bed may have been utilised on occasion. This material was certainly in use by the NMP at the Oak Park camp in 1880, near Gilberton (about 380 km south of Boralga), (Oak Park Daily Journal, 25 and 27 May 1880) and at the Musgrave camp in 1891 (about 130 km north of Boralga) (Musgrave Native Police Camp, part 1 1891). At the nearby historic Old Laura homestead complex (c1892), located 6 km north of Boralga, it was also documented that termite mounds were used and mixed with ox blood to make the floors; ‘the kitchen also had a dirt floor made from compacted termite mounds’ (NPSR, 2017). The Boralga site provided an excellent opportunity for assessing the value of geophysical survey for identifying ant bed floors, especially given the observations of Jerry Musgrave and George Musgrave at the site. A combination of ground-penetrating radar (GPR) and magnetic gradiometry was employed, followed by excavation of target areas, and subsequent geoarchaeological, magnetic susceptibility and soil chemistry analyses on sediment samples. Geoarchaeological studies have provided invaluable information on how natural resources may have influenced the construction of settlements and offer a way to connect the invisible to the visible (Rapp Jr. and Hill, 1998; Sampietro and Vattuone, 2005). Our study not only offered a way to understand part of Boralga’s built environment but also allowed the chance to evaluate other geophysical signatures created by the NMP at the site, which in turn provided insights into their past activities.

2. Boralga NMP camp

The Boralga NMP camp is located on the floodplain of the Laura River, at the southern extremity of Rinyirru National Park about 18 km downstream from the town of Laura on Cape York Peninsula, Australia (Fig. 1). It is situated within the Laura Basin, which contains dissected sandstone hillslopes and plateaux in the uplands, and residual alluvial sands derived from the sandstones in the lowlands (Biggs and Philip, 1995; Morgan et al., 1995). This is part of the Eastern Uplands Physiographic Region and includes uplands and coastal areas of the western part of the Cape York Peninsula, including the Great Escarpment. The uppermost part of this area is the Battle Camp Formation, which is characterised by a conglomerate of shaly sandstone and leached shale of the Lower Cretaceous age (Lucas and de Keyser, 1965). The Laura River Basin is a major feature in the peninsula’s hydrology and extends from the edge of the continental shelf into Princess Charlotte Bay to the east (Smart and Rasidi, 1979).

Soils on the Boralga site are primarily alluvial sands that tend to have a high clay content and are typically classified as hydrosols. The most common local soil type are *Antbed* Soils, these being deep redox hydrosols that are sourced from a mixture of metamorphic rocks and arkosic, rocks rich in quartz and feldspar, sediments (Biggs and Philip, 1995:42, 108). These soils occur on the alluvial plain — an area dotted with termite mounds today. The upper horizons are dark grey (10YR4/1) loamy fine sand with some organic matter, overlying a mottled grey-greish brown (10YR5/2) occasionally bleached loamy fine sand horizon. A mottled yellow-brown (10YR5/3) sandy clay loam underlies this, becoming more alkaline with depth, with soil pH ranging from 5.5–6.5. When the sediment is dry, it becomes very firm, and during the dry season, it is difficult to excavate the soil below 30 cm.

The Boralga NMP camp was established by 1876 close to the Laura Telegraph Station, the Laura River crossing and the Palmerville Track to the Palmer Goldfields. The camp operated until 1894, when it was closed and the buildings dismantled and their materials transported elsewhere for reuse (Cole, 2004; Cole et al., 2002). The only known historical plan of the site is Stanhope O’Connor’s 1877 ‘Plan of Police Reserve on the Laura River’, which shows an area of 238.5 acres, including a complex of six buildings, a ‘swamp’ and the Laura River. The

¹ Many species of both ants and termites construct mounds across Australia and it appears that any of them could be used for flooring, depending on local availability (see later in this paper for further explanation).

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