



KEYWORDS: *Archaeology – Willandra Lakes – Finger marking – Footprint*

## FINGER MARKINGS AND THE WILLANDRA LAKES FOOTPRINT SITE, SOUTH-EASTERN AUSTRALIA

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**Abstract.** This paper attempts to contribute to the discussion of finger markings or flutings found in limestone caves around the world by presenting data on two crescent-shaped grooves made in soft clay and found amongst the largest known collection of Pleistocene human footprints in the world, in the Willandra Lakes region of south-eastern Australia. The site represents activities of a band of Aboriginal people during the last glacial maximum, between about 17 000 and 23 000 years ago. Pintubi people from central Australia identified the grooves as finger markings made by children playing on the clay surface of an ephemeral soak. The markings are similar to the finger flutings found elsewhere in Australia and in other parts of the world on montmilch deposits on the walls and ceilings of limestone caves. They are amongst the oldest markings of this kind. If the Pintubi interpretation is correct, these markings are extremely rare examples of what was once probably a widespread form of marking world-wide, preserved in clay in the open air, rather than the much more usual limestone caves. This paper highlights the remarkable continuity in the practice of making such markings over a considerable period of time, from this site through to observations that finger markings were still being made during ceremonies in the Western Desert in the 1960s.

### Introduction

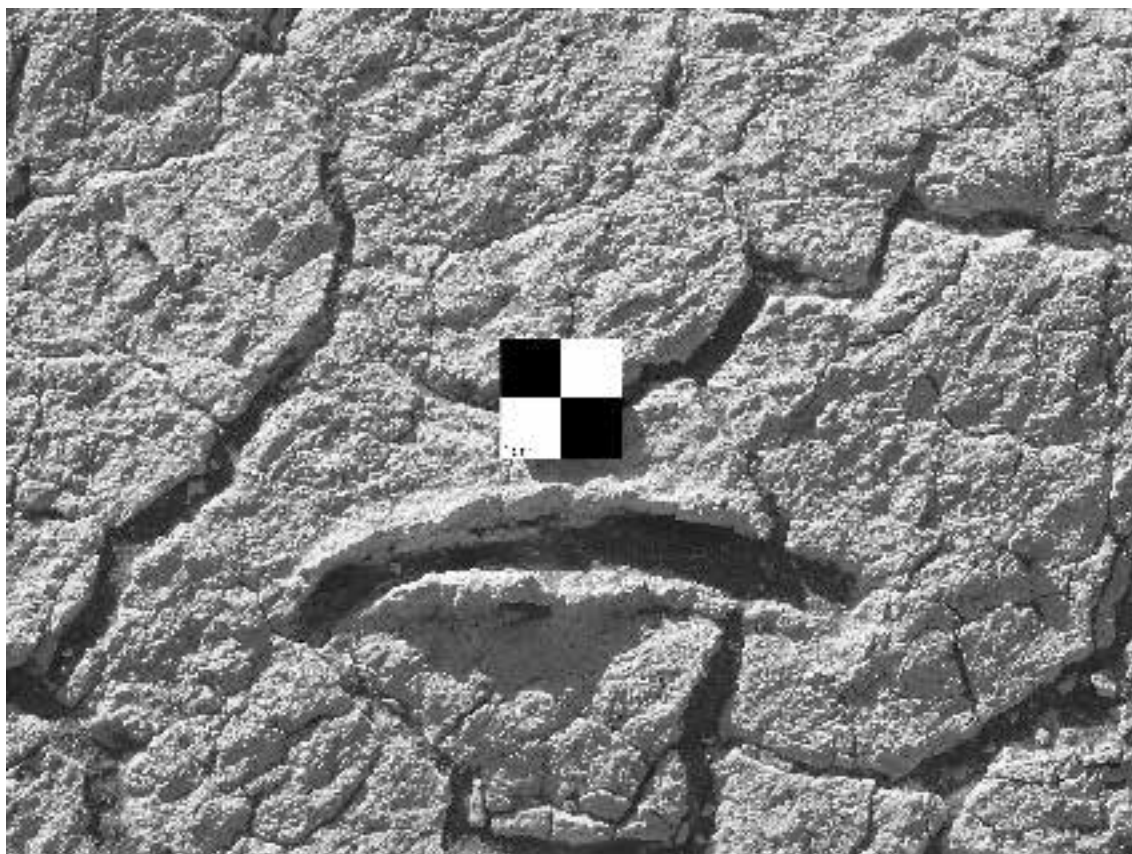
Finger markings found on the walls and ceilings of limestone caves from around the world have been the subject of investigation for a long period of time (e.g. Aslin et al. 1985; Bednarik 1984, 1986, 2008; Faulstich 1992; Lorblanchet 1992; Sharpe and Van Gelder 2006a, 2006b). Debate and discussion has centred on the meanings behind the markings, as well as their origins, with Bednarik (1986) observing that extant finger markings are only a small sample of what was once probably a widespread phenomenon. This paper attempts to contribute to these discussions through a consideration of a new site with possible finger markings in south-eastern Australia.

In 2003, an exciting discovery was announced in the Willandra Lakes region of western New South Wales – the largest known collection of fossil trackways of Pleistocene human footprints and other tracks and markings anywhere in the world, exposed on a hardpan, or indurated horizon of calcareous silty clay near the stranded shoreline of a small waterhole or soak between Lakes Garnpung and Leaghur (Webb 2007; Webb et al. 2006).

The footprints and other markings were initially found to cover an area of approximately 700 m<sup>2</sup>, but subsequent excavations to the north of the original

area uncovered an additional 150 m<sup>2</sup>, exposing a total of 563 complete prints plus further incomplete or indistinct markings. A ground-penetrating radar survey indicated the possibility for an estimated additional 2000 prints over an area extending a further 70 m east and 40 m north of the present footprint pavement (Webb 2007). The footprints comprise some twenty-three trackways, or trails, made by the Indigenous inhabitants of the area, incorporating adults, adolescents and children, travelling across the surface of an ephemeral soak during repeated cycles of wetting and drying of the site. As well as the human footprints, there are groups of unusual circular or oval impressions, with diameters between 42 and 55 mm, and a series of linear marks some 1.2–4.5 m long (Webb 2007; Webb et al. 2006).

Maximum and minimum ages for the footprints were determined from optically stimulated luminescence (OSL) dating of the burial of quartz sand grains from sediments above (19 400 ± 1100, GP02; and 19 200 ± 1900 years ago, GP04) and below (23 000 ± 1200 years ago, GP03) the hardpan in which the footprints occur (Webb 2007; Webb et al. 2006: Fig. 3). This late Pleistocene age is secure, and is in keeping with the view that the hardpan was only exposed for short periods of time, and with the generally excellent state



*Figure 1. Possible finger marking from the Willandra Lakes footprint site, south-eastern Australia (photograph courtesy of Steve Webb). Scale in cm.*

of preservation of the footprints (Webb et al. 2006).

The Willandra Lakes footprint site provides a rare glimpse into the life of a band of Aboriginal people at the height of the last glacial period. The focus of this paper is, however, not on the footprints, but on two wavy grooves constituting crescent-shaped impressions in the soft clay surface of the site.

#### **Possible finger markings at the Willandra Lakes footprint site**

Amongst the human footprints and other tracks, straight lines, and circular and oval impressions are two 'random wavy grooves in a small partial semicircle' (Webb 2007: 714; see Figure 1). These grooves have not been recorded in detail and Figure 1 is the only known photograph. The groove shown in Figure 1 appears to have been made by the pulling of a finger, spear or stick across the once-soft ground surface, creating a slightly curved marking. The groove measures approximately 136 mm in length. It tapers at one end, and has a width ranging from approximately 9 mm to 14 mm. The clay has been piled up slightly on the upper and lower edges of the groove, especially towards the more curved, tapering section. The spatial relationship of the groove to the tracks at the site was not recorded, and the dimensions and a description of the second groove are not available, as it, along with the rest of the footprint site, has been reburied for protection. However, it has been suggested that

there were no footprints within one to two metres of the markings (representatives from the NSW National Parks and Wildlife Service and the Three Traditional Tribal Groups, pers. comm. 2008).

Further forensic investigation of the markings, such as microscopic analysis and a trace analysis in situ, would be valuable; however, it is not possible at present as the site has been reburied, as noted above. Such analyses may be possible in future if the markings and footprints at the site were to be uncovered, and could be undertaken by appropriate experts at that time.

Pintubi people from central Australia were invited to the site to provide 'a unique and traditional interpretation of the trackways as a people who live in the same traditional way as those making the prints may have' (Webb 2007: 714). The Pintubi confirmed the interpretations of the sex of the individuals responsible for many of the trackways that had been based on measurements of the footprints (Webb et al. 2006), and the series of trackways as representing a possible hunting event (Webb 2007). A 70 cm groove was also said to represent the mark left by a spear ricocheting off the soft ground. Small circular depressions were identified as resulting from the blunt ends of spears and digging sticks being rested on the soft soil. Importantly for the focus of this paper, the Pintubi identified the two crescent-shaped grooves as finger markings made by children in the soft clay

surface (Webb 2007). This interpretation is consistent with Pintubi identifications of some of the footprints, including those of a four to five-year-old child.

As well as documenting Aboriginal people living and hunting in the vicinity of a water hole, the Willandra Lakes footprint site may also provide a unique glimpse of children playing and 'doodling' during the height of the glacial maximum. The aim of this paper is to discuss the implications of the Pintubi interpretation of the grooves at the site, and not to test whether or not they are finger markings.

### Finger markings around the world

The crescent-shaped grooves made in the soft clay at the Willandra Lakes site are of interest in a broader context as well. They are very similar to the meandering finger markings or flutings ('the lines that human fingers leave when drawn over a soft surface', Sharpe and Van Gelder 2006b: 179) found elsewhere in Australia modelled in deposits of once-soft limestone precipitates (*montmilch* or 'moonmilk') on ceiling and wall surfaces of limestone caves (Aslin et al. 1985; Bednarik 1984, 1985, 1986, 2008; Faulstich 1992). Finger markings occur in limestone caves in the south-west of the continent, on the Nullarbor Plain, in the Mt Gambier region of South Australia, and in the southern highlands (Bednarik 1986: Fig. 2; Habgood and Franklin 2008: Table 6). Finger markings are also found in the Tari region of Papua New Guinea (Ballard 1992) and in Europe (Bednarik 1984, 1986, 1999; Sharpe and Van Gelder 2006a, 2006b; Sharpe et al. 1998, 2002).

Bednarik (1986) argued, on the basis of taphonomic logic, that the extant finger markings in limestone caves in Australia are only a small sample of what was once probably a widespread phenomenon, and that finger markings were probably also once executed in sand, soil, clay, mud, snow and other perishable media. Within this context, Gould (1969; see also Flood 2006) recorded a ceremony in the Western Desert in the 1960s, where black mud was piled onto a white limestone shelf at a waterhole and elaborate serpentine designs inscribed with the fingers in the wet mud, so that the entire surface of the mud mound was covered with twisting and turning finger markings. The entire composition at the waterhole was not intended to last, as it would soon be eroded by the wind and weather, and the ritual repeated in the following year. This central Australian example and the Willandra Lakes markings demonstrate that finger flutings were made on ephemeral surfaces like those suggested by Bednarik (1986), and that such markings may be the result of a range of activities, including ceremonies and the spontaneous and opportune actions of children.

Finger markings were presumably made over a considerable period of time (Bednarik 1984, 1999; Sharpe and Van Gelder 2006a, 2006b), and in the European caves they have been assigned variously to the Perigordian, Gravettian, Magdalenian and even the

Historic period. However, more precise dating has proven difficult. Although it is possible, even probable, that some of the finger markings may even date to the Aurignacian, these attributions are often estimates or there remain debates over the dating of some of the caves (e.g. Lorblanchet 2004; Pettitt and Bahn 2003; Pettitt et al. 2009). The Willandra footprints and finger markings, on the other hand, are bracketed by dates of  $19\,400 \pm 1100$  (GP02),  $19\,200 \pm 1900$  (GP04) and  $23\,000 \pm 1200$  years BP (GP03).

In Australia, Bednarik (1985, 1990) has reported finger flutings from thirty-two caves. These include late to mid-Holocene examples, such as those in Prung-kart Cave, South Australia (Bednarik 1998), numerous undated ones, such as New Guinea II, eastern Victoria (Ossa et al. 1995), while those of Malangine and Koongine Caves, South Australia, and several other sites are proposed to be of late Pleistocene age (Bednarik 1984, 1998, 1999; Frankel 1986; but see Habgood and Franklin 2008). Bednarik (1999) obtained a uranium series minimum date of around 28 000 years BP for finger markings at Malangine Cave, derived from a calcite sample sandwiched between two traditions of non-figurative petroglyphs both preceded by the finger markings. However, it conflicted with a rejuvenated radiocarbon date of about 5550 years BP from the same sample, which thus provides a conservative minimum estimate for deeply pounded petroglyphs postdating the finger flutings.

At Koonalda Cave on the Nullarbor Plain, finger markings are assumed to have been made some time between 14 000 and 24 000 years BP, as flint mining took place in the cave during this period (Wright 1971; see also Rosenfeld 1993; Franklin and Habgood 2007; Habgood and Franklin 2008). Gallus (1971) obtained an older date of  $31\,000 \pm 1650$  (V-82); however, it is anomalous with the stratigraphically consistent sequence of younger dates obtained by Wright (1971). Although the markings may be as young as 14 000 years or as old as 24 000 years, there is support for an age of  $19\,900 \pm 2000$  years BP (V-92) derived from a charcoal sample directly below a concentration of the markings, possibly the remains of a torch used to provide light for the execution of the art (Maynard and Edwards 1971; Wright 1971). However, the finger markings cannot be directly related stratigraphically to the dated charcoal sample (Rosenfeld 1993; Wright 1971).

If the Pintubi interpretation of the crescent-shaped grooves as finger markings is accepted, then the Willandra Lakes markings, dated to between about 17 000 and 23 000 years ago, and probably closer to 19 000 years ago (Michael Westaway, pers. comm.), would currently be amongst the oldest known examples of finger markings in the world.

Explanations for the production and meaning of finger markings have included artistic transitions, human impulses to make marks influenced by the softness of the medium, imitations of marks appearing

in nature, intentional representations of motifs and symbols, ceremonial purposes and shamanistic rituals (Sharpe and van Gelder 2006b). The Willandra Lakes grooves described here suggest that such markings may have been the result of the spontaneous and opportune activities of children — the result of play, 'pre-Historic children's "finger painting"' (see Bednarik 1986; Mulvaney and Kamminga 1999: 365). Confirmation that children most probably made some of the finger markings in caves comes from various metrical analyses and experimental studies (Aslin and Bednarik 1984; Bednarik 1987–1988, 2008; Sharpe and van Gelder 2006a, 2006b, 2006c; Sharpe et al. 2002). At Rouffignac Cave, France, these have shown that many of the finger flutings were most likely produced by young children, aged two to five, who were held aloft to draw their hands along the cave ceiling (Sharpe and van Gelder 2006b). At Pech Merle, two bands of lines were clearly made by two small hands, either those of a woman or an adolescent. The presence of young people in the cave is also attested by the footprints of children on the cave floor (Lorblanchet 1992). Children's footprints have been found in many other Palaeolithic caves in Europe (Bahn 1998; Bednarik 2008), where they constitute over 90% of the total number of tracks and represent mostly children aged from nine to fifteen years (Bednarik 2008), and also at the Willandra Lakes site (Webb 2007; Webb et al. 2006). Furthermore, many of the finger markings in the South Australian caves were made by small hands, possibly juveniles, and children may have made some of the hand stencils that predominate at other South Australian caves (Bahn 1998; Bednarik 1986) as well as the prints of fingertips on stone plaques in several Upper Palaeolithic caves in Europe (Bednarik 2008).

If the Pintubi interpretation of the crescent-shaped marks at the Willandra Lakes footprint site is accepted, then children appear to have made marks in soft material when the opportunity arose and may also have contributed to the accumulation of finger markings and other art forms, such as stencils, found in some caves.

However, there remains the possibility that the markings may have been made by other means, including:

- By a digging stick, and there is a high likelihood that digging sticks were used in the area because roots and tubers of water plants probably grew around this wetland feature (Webb 2007);
- By a spear, which is also possible as the Pintubi interpreted several of the marks at the site as being made by spears resting on their blunt ends, or a spear ricocheting off the muddy surface (Webb 2007).

There are also potential explanations for the lack of close association between these markings and footprints at the site. For example, there may have been differential preservation of footprints and other markings. Alternately, they may have been made by a

person standing in shallow water, so that the footprints are not preserved, and the marks were therefore near the 'shoreline'. This interpretation is possible, as there is a pattern of small basins or ponds at different levels in the clay surfaces at the site caused by repeated cycles of wetting and drying.

However, the Pintubi interpretation that the markings were made by a child or children is consistent with the presence of children at the site, as indicated by their footprints. There is currently considerable discussion of the role of children in the making of hand stencils around the world, and especially in the making of finger markings or flutings. That children may have made the markings also adds another dimension to the interpretation of the Willandra Lakes footprint site — families at work and play at the height of the last Ice Age.

### Conclusion

The newly recognised Willandra Lakes markings are extremely rare examples of what was once probably a widespread form of marking across the world. The markings have been preserved in clay in the open air, compared to their much more usual preservation in *montmilch* deposits in limestone caves, confirming Bednarik's (1986) predictions. The markings in the Willandra were possibly made by children playing on the clay surface of an ephemeral soak. They are found amongst the largest known collection of Pleistocene human footprints in the world, representing the activities of a band of Aboriginal people during the last glacial maximum, between 17000 and 23000 years ago. They are therefore amongst the earliest examples of such markings. Their presence at this early date, and observations that finger markings were still being made during ceremonies in the Western Desert in the 1960s, indicate a remarkable continuity in practice over a considerable period of time, though not necessarily continuity in meaning, with both spontaneous play and ceremonial purposes being possible scenarios at these two localities.

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