Locating places for repatriated burial: a case study from Ngarrindjeri *ruwe*, South Australia

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In this ingenious co-operative case study, archaeologists and Indigenous peoples use geophysical survey to scan suitable places for the reburial of repatriated human remains. The process is also building a procedure for the low impact and respectful research of early Indigenous burial locations.

Keywords: South Australia, Indigenous burial, repatriation, reburial, geophysical survey

Introduction

> *We ask non-Indigenous people to respect and understand our traditions, our rights and our responsibilities according to Ngarrindjeri laws and to realise that what affects us, will eventually affect them* (Ngarrindjeri Nation 2006: 13).

In recent decades the issue of repatriation has generated much debate, and increasing pressure has been brought to bear on institutions to repatriate their collections of Indigenous skeletal remains and cultural objects (Fforde 2004; Fforde *et al*. 2002). Alongside their international counterparts, Australian Indigenous communities have been at the forefront of this movement, since many of their ancestors were placed in collections by the scientific community with the aim of ascertaining where they 'belonged' in evolutionary and racial classification schema. The process of repatriating Indigenous Australian skeletal remains is now well underway with many large collections having been returned (e.g. Hall 1986; Hemming & Wilson 2005; Lahn 1996; Turnbull 1993). However, there remain many outstanding issues for resolution.

The repatriation of human remains is the beginning of a complex process that often rapidly exhausts local capacities and resources (Wilson 2005). Generally speaking there are three options available: retaining the remains in a Keeping Place (whether temporarily or permanently); cremation; and/or reburial. While recognising the importance of all these options, we concern ourselves here only with issues relating to the third option, reburial, and only when interment occurs in the ground (as opposed to bundle burials being placed in caves or logs).

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In some instances, the community desires that reinterment occurs as soon as possible, and this is carried out quickly wherever access to land with secure tenure can be obtained. For other communities, it is critically important to ensure their ancestors are reburied as close as possible to their original interment locations, often entailing a lengthier process in order to ascertain where that might be. Unfortunately, this outcome is not always achievable as sometimes the accompanying documentation is insufficient to determine the original burial location, or alternatively the burial site may have been developed in the intervening period. In one instance involving the Muthi Muthi people, the original burial site had subsequently become a popular public camping area and Elders felt reburial would be safer in a more private location nearby (Mary Pappin *pers. comm.*). Likewise, when almost 200 individuals excavated in the 1970s from the Broadbeach burial ground (Haglund 1976) were repatriated, the Kombumerri community chose a reburial location in parkland *c*. 1km from the original burial ground, the latter of which had been developed (Hall 1986). A different solution will sometimes emerge whereby reburial will take place in a mission cemetery with which the community has a connection, as was the case when human remains were recently repatriated to the North Stradbroke Island community (Aird 2002).

Regardless of the specific circumstances, Indigenous communities typically express the strong desire to not cause disturbance to their *in situ* ancestors during any reinterment event. For this reason, the ideal reburial location will satisfy community cultural requirements whilst having a low potential to already contain cultural materials, in particular skeletal material. However, when known burial grounds are used for reinterment the very real possibility exists that the digging of new graves will result in disturbance to existing graves.

One method of finding appropriate places for reburial involves the application of geophysical survey. This application differs from normal archaeological objectives, since its main purpose is not to find pre-existing sites, but to find ground that is relatively undisturbed within traditional burial places. In this paper we evaluate the use of geophysical techniques in exploring areas for potential reburial. We find that the ability to map the locations of existing graves and identify areas of undisturbed ground through the application of non-invasive geophysical techniques is one that could prove valuable to communities beyond those of Indigenous Australians, including the research community.

The cultural context of 'collecting' and repatriation in Ngarrindjeri *ruwe*

The Ngarrindjeri nation (see Figure 1) was possibly the most affected of any Indigenous group by nineteenth and twentieth-century 'collecting'. The Ngarrindjeri *ruwe* ('lands and waters') in the lower reaches of the Murray river was rich in riverine, coastal and estuarine resources. Consequently it supported very high population densities which in turn translated into large numbers of burials, often located in the unconsolidated sands of the extensive contemporary and relict dune systems of the region (Pardoe 1988). Such sites are of strong cultural significance:

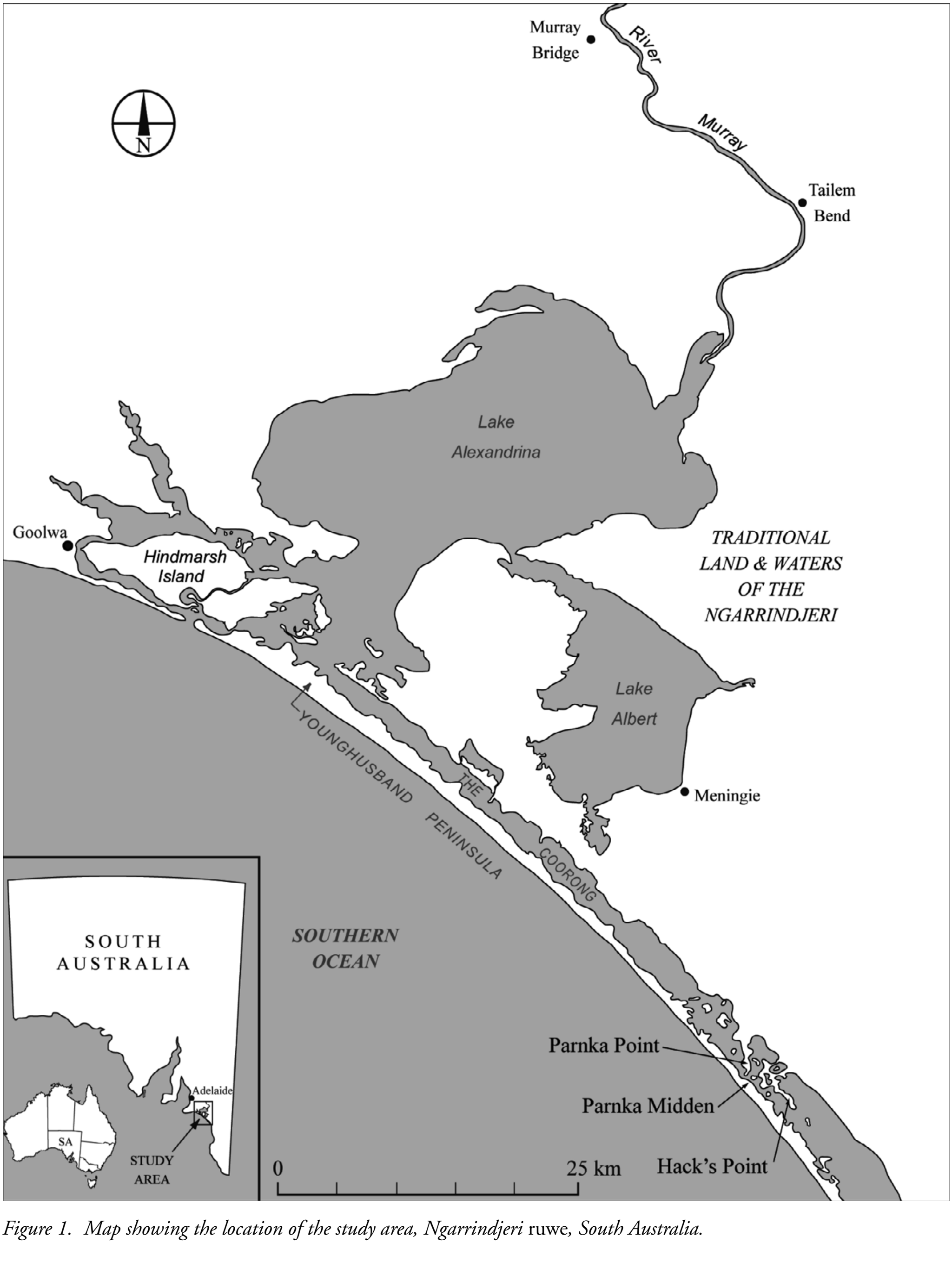

Figure 1. Map showing the location of the study area, Ngarrindjeri ruwe*, South Australia.*

For Ngarrindjeri people the spirits of the ancestors are still present at these sites and they believe that these spirits can have an impact on contemporary people and events. If they are disturbed they can be dangerous (Hemming2000: 3).

Likewise, one of the co-authors of this paper has also made clear the importance of burial sites:

> *Where the people must go, they must remain. They can't be dug up and moved elsewhere. We cannot tamper with the place of the dead, the tools of the dead, the things sacred that are left with the dead, or the dead themselves* (George Trevorrow, as cited in Bell 1998: 286).

Unfortunately Ngarrindjeri cultural beliefs about their ancestors' resting places were not heeded by nineteenth-century invaders. And neither was the viability of the living population: when the South Australia Company arrived in 1836 it was estimated there were at least 3000 Ngarrindjeri (Jenkin 1979); within 50 years only about 100 remained (Taplin 1879). After Darwin published *On the Origin of Species* in 1859, scientific interest in the concepts of evolution and 'races' led to frantic efforts by researchers to gain access to skeletal remains of Indigenous peoples around the world, particularly Australian Aboriginals who were considered at that time to belong to the 'lowest' rung on the 'ladder' of humankind (Hubert & Fforde 2002). Owing to the establishment of key institutions and the actions of a few crucial figures, Adelaide was set to take centre-stage in the gruesome body supply network, with the nearby, extensive Ngarrindjeri burial grounds destined to bear the brunt of the ensuing desecration. The University of Adelaide (UA) was established in 1874 and its medical programme commenced a few years later. Edward Stirling served as the UA Professor of Physiology from 1887-1896 (Edgeloe 1991). Additionally, he served as the Honorary Director of the South Australia Museum (see below) from 1885-1912 where he is credited as being *'largely responsible for its excellent collection of Aboriginal cultural specimens'* (Mincham 1976: 200). Archibald Watson was appointed to the UA Elder Chair of Anatomy in 1884, a position he held until 1919 (Edgeloe 1991). Both Stirling and Watson had completed their medical training in Europe, and were both Fellows of the Royal College of Surgeons, an institution that amassed an enormous collection of skeletons (Fforde 1992). William Ramsay Smith was another key Adelaide resident, having variously served as the Chairman of the Central Board of Health, the City Coroner, Inspector of Anatomy, a doctor at the Adelaide Hospital and 'collector' on behalf of his *alma mater*, the Anatomy Department at the University of Edinburgh; his actions in the final role assisted that particular institution in assembling the largest collection of Indigenous skeletal remains in Britain (Fforde 2002: 73).

In combination the above factors resulted in many hundreds of Ngarrindjeri 'Old People' (i.e. ancestral remains) being stolen and sent overseas. Yet more Old People were not sent overseas, but instead were retained by the South Australia Museum - the major local collecting institution established in 1856 (Hale 1956). It is estimated that this institution currently holds approximately 1000 remains (Hemming & Trevorrow 2005: 254), many of which were collected under the auspices of archaeological research. For example, 136 individuals were 'excavated' from the Swanport burial ground by Stirling (1911) and added to the South Australia Museum collections, which were still being expanded in the 1970s through investigations of the Roonka burial ground (Pretty 1977).

Although Ngarrindjeri people had been requesting the return of their Old People since as early as 1903 (Steve Hemming *pers. comm.*), repatriation did not commence in any major way until April 2003, when more than 300 Old People, mostly collected by Ramsay Smith, were returned to the community from the University of Edinburgh, an event followed in 2004 by the return of 74 Old People from Museum Victoria. While Ngarrindjeri Elders discuss how and where to proceed with reinterment, the majority of the repatriated Old People are cared for in a temporary keeping place at Camp Coorong, a community run cultural education centre.

While there are many important decisions to be made with regards to reburial, at the forefront of most Ngarrindjeri peoples' minds is the cultural imperative to re-inter the Old People in their rightful *ruwe*:

> *. . . they* [the government] *would like us to take all our Old People's remains and take them to one central location and do a big reburial. For example they say why don't you take them all home to Raukkan? You've got a burial ground there and bury them all there or why don't you take them to Murrunggung at Wellington or somewhere else and do one big reburial? We can't do that because culturally that's wrong. If they come from the river that's their country, that's their* lakalinyerar *and their* Ngartji *group - their totem group where they come from. If they come from the lake that's their group, if they come from the Coorong that's their country there and that's where they have to go back* (Tom Trevorrow, as cited in Wilson 2005: 93).

It is within this context that in September 2006 the Ngarrindjeri community set about conducting the first of many reburial ceremonies necessary following the Edinburgh and Museum Victoria repatriation events. Written documentation accompanying the repatriated Old People was minimal, but in one case it was sufficiently detailed to determine that some had been taken from Hack's Point, a small promontory in the lagoonal waters of the Coorong (see Figure 1). Hack's Point is one of the few remaining areas which contemporary Ngarrindjeri people retain direct control over, and community members have a detailed knowledge of its complex, multi-layered landscape. It was traditionally used for a restricted range of specific cultural activities, and the results of archaeological surveys and excavations in the area reinforce the oral histories, revealing burials, fish traps, stone artefact scatters (quite rare in the region) and a small number of low density shell scatters associated with cooking stones (Wallis *et al*. 2006; 2007).

Following numerous community discussions, the Ngarrindjeri leadership decided to carry out the reburial of 13 Old People at the southern end of Hack's Point on the margin of a small mound known to be a traditional burial ground. Elders expressed considerable concern that the reinterment should not disturb existing burials, and so arrangements were made to conduct a geophysical survey prior to the reburial to assist them in making an informed decision about where to position the new graves.

Using geophysical techniques to locate burials

The use of geophysical techniques in archaeological and forensic investigations to locate graves is well documented, though typically in situations involving historic or very recent interments rather than Indigenous burials (e.g. Davenport 2001; Powell 2004; Roark *et al*. 1998; Ruffell 2005). Of the methods available, ground penetrating radar (GPR) has proven to be the most consistently successful (France *et al*. 1992), usually when there are clear areas of dislocated stratigraphy or where interment involves a coffin. In some specific geological environments the skeletal material itself can be detected (e.g. Schultz *et al.* 2006), although this is extremely rare. The downside of GPR is that it tends to require extensive post-acquisition processing and the instrumentation itself is expensive. Direct current resistivity has also been used as a tool for geophysical investigations of burials with some success (Owsley *et al.* 2006).

Other techniques that have been used with varying degrees of success for sub-surface burial detection include magnetometry and electromagnetic induction. Magnetometry, either in single sensor or gradiometer mode, has a long history of use in European and North American archaeology (e.g. Abbott & Frederick 1990; Black & Johnston 1962). Fire has been a particular target of magnetometer investigations as this event has been demonstrated to create magnetic anomalies either through the enhancement of soil magnetic susceptibility (Dalan & Banerjee 1998; Weston 2002) or the contribution of wood ash (McClean & Kean 1993; Peters *et al.* 2001), or from both mechanisms (Linford & Canti 2001). If burial traditions involved an aspect of fire (such as smoking the burial pit or cremation of the body itself), magnetometry may be of some assistance in identifying interment locations. An additional use of magnetic methods for the location of burials is through the disturbance of magnetic properties of the soil stratigraphy (Nobes 1999: 363).

Electromagnetic induction (EMI) is capable of detecting a wide range of features including soil type, sediment type, bedrock location or presence of cultural material and has been applied with success at archaeological sites for a variety of tasks (Kvamme 2003). The EMI technique can locate burials through either the detection of metallic grave goods or metal within the interment 'vessel', or through changes to the soil conductivity caused by the burial and associated sedimentary disturbance, as well as theoretically by detecting the actual skeletal remains themselves, although the latter is unlikely in most situations (Nobes 2000: 716; Nobes & Tyndall 1995: 266).

Survey methodology

The Hack's Point survey was carried out using magnetometry and EMI techniques, chosen on the basis of their inexpensive nature, wide availability, ease of execution and the specific types of anomalies we expected to encounter. Traditional Ngarrindjeri burial ceremonies were conducted over periods up to three months and included the use of fire for smoking bodies suspended on platforms (Bell 1998: 296; Taplin 1879), as well as possibly smoking the burial pits (the latter practice is surmised based on the discovery of charcoal in the base of burial pits; see Wallis *et al.* 2006; 2007). Other anomalies that might potentially have been detected during the survey included ground disturbance unrelated to human interment, such as campfires, animal burrows or tree roots. Other experience in the region had demonstrated that the application of GPR in this context was likely to be unsuccessful owing to the presence of extensive rabbit burrowing (Moffat *et al.* 2007).

The general survey location was clearly defined by members of the Ngarrindjeri leadership as a small area, allowing a 20 × 20m survey to be completed within a restricted time frame. A 1m grid was laid out over the survey area using an automatic level to facilitate the collection of topographic, EMI and magnetometer data. While laying out and collecting data over a 1m survey grid is time consuming, it has the benefit of ensuring the spatial data

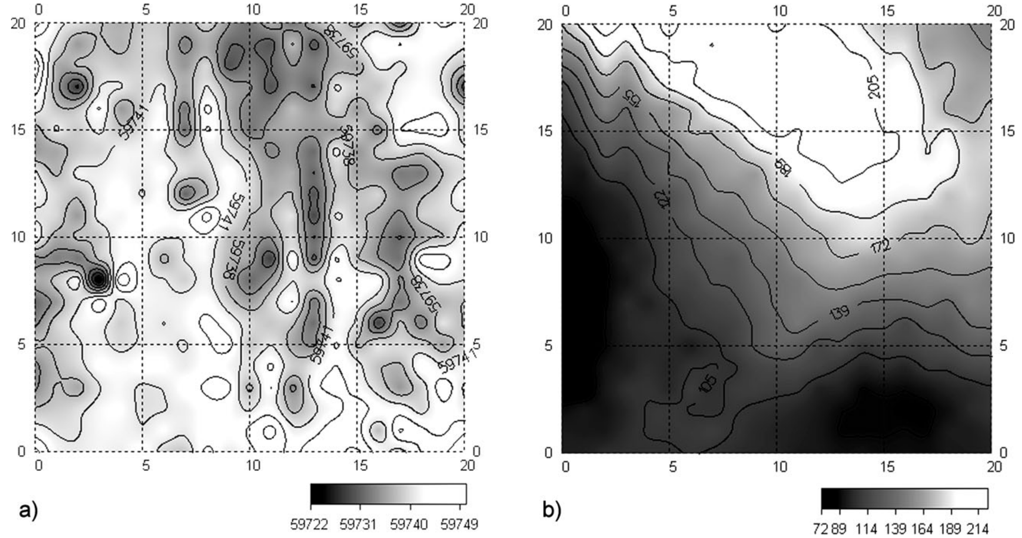

Figure 2. Geophysical survey results with magnetometer data in nanoteslas (a); and electromagnetic induction data for the 9125 Hz frequency in Ec units (b).

is accurate to approximately ±10cm, dependant on the degree of topographic change across the site, vegetation cover and daily climatic conditions. Given that Australian Indigenous sites are generally characterised by a low degree of anthropogenic modification to their detectable physical properties, accurate positioning information significantly enhances the chance of locating them. All collected data were gridded with MagPick software using a spline interpolation (Smith & Wessel 1990) with an X and Y interval of 0.1, a tension of 0.25 for 4000 interations with a convergence limit of 0.1 using the highest and lowest data values as data limits. Data were displayed as a simple contour map with 250 non-equalised colour points with overlain contours.

Results

Several discrete magnetic anomalies were identified within the survey area interpreted as resulting from the formation of magnetic minerals during burning events (see Figure 2). The narrow range of magnetic intensity values (less than 30nT) highlights the subtlety of these features, probably a result of the low expected level of iron oxides within the local sediment (cf. Gaffney & Gater 2004: 39). Despite this, features from Indigenous burning activity have successfully been detected using the same equipment as that used in this survey and so the results are directly comparable (Abbott & Frederick 1990; Frederick & Abbott 1992). No discrete anomalies were located using EMI. This may reflect the small volume of skeletal material present within individual burials and the relatively homogenous composition of the lithological material within the survey area, suggesting that transitions between grave fill and *in situ* material would be muted.

Clearly this investigation was not a definitive test of the applicability of magnetometry and EMI methods to locate sub-surface skeletal material, for which many studies already

Figure 3. View of the reburial ceremony being conducted on 26 September 2006. Note the low mounded feature, known to be a traditional burial ground, and the recently dug grave for the repatriated Old People.

exist (eg. Buck 2003); indeed, it would have contradicted the philosophy of this study to attempt to ground-truth the geophysical results. Nevertheless, on the basis of the geophysical survey results, an area with no evidence for prior disturbance was identified, the grave was subsequently dug without encountering any cultural material and the first Ngarrindjeri reburial ceremony and reinterment was successfully conducted on 26 September 2006 (see Figure 3).

Towards a community based geophysical survey methodology

The geophysical survey philosophy developed in this case study has significant applications within the repatriation process. Indigenous communities are often confounded by the number of individuals repatriated and the desire to reinter their ancestors in known burial grounds whilst not disturbing *in situ* burials. Given the lack of financial support to Indigenous communities for conducting reburials (Meara 2007; Wilson 2005), particularly when numerous reinterments are involved, the cost of utilising commercial geophysical survey companies to help locate appropriate sites would be prohibitive. The solution proposed here was the employment of a robust survey methodology that can be applied using inexpensive and widely available equipment that is relatively simple to operate in the field by the members of the community themselves.

Previous experience of teaching undergraduate and postgraduate archaeology students at Flinders University with no prior geophysical survey experience has shown that in just two days students can become sufficiently skilled to independently conduct simple magnetometer and EMI surveys over small areas. While competency in data acquisition tasks is rapidly attained, a much greater investment of time is required in order to attain proficiency in data processing and interpretation. This is because the operator must have been exposed to the geophysical responses of many targets in a variety of settings before they can make robust interpretations of their data (Schurr 1997: 76). We consider this point to be particularly relevant here, as the types of anomalies likely to be found in repatriation related surveys will present as very subtle targets. Our experience does however suggest that like university students, Indigenous community members could be trained to collect their own geophysical data with some techniques, which could then be passed on to experienced operators for processing and interpretation to assist in the identification of suitable sites for reburial. This would significantly decrease the cost of conducting commercial geophysical survey on such sites, through the elimination of field related professional staff and mobilisation costs.

Conclusion

As repatriation events become more common throughout Australia and around the world, Indigenous communities are moving forward, making decisions about how best to care for their newly returned ancestors. At the same time archaeologists continue to negotiate their position(s) in the repatriation debate, with many attempting to establish new, more equitable relationships with communities to ensure the continued relevance of the discipline in the modern political context. Geophysical methods were successfully utilised by the Ngarrindjeri community to assist them in carrying out a reburial ceremony in 2006 without causing damage to their already interred Old People. At the same time, investigations here and elsewhere (Moffat *et al.* 2007) have demonstrated that in at least some instances geophysical techniques offer the potential to locate and map Indigenous burials (or their absence) in a non-invasive, culturally appropriate manner. Thus, working in partnership with the Ngarrindjeri community, archaeologists have discovered that reburial is affording hitherto unrealised opportunities for research. Our experience suggests it is relatively inexpensive to train Indigenous community members in geophysical data acquisition techniques. They can then purchase or hire the equipment necessary to conduct geophysical surveys of potential reinterment locations themselves. Archaeologists and geophysicists can provide off-site support in processing and interpretation and at the same time reap a research dividend. The Ngarrindjeri case study demonstrates that archaeologists can continue to engage with Indigenous communities in the repatriation process in a positive manner, building relationships that facilitate collaborative research opportunities in the future.

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