

# CHAPTER 1

## INTRODUCTION

*It is a region of vast alluvial plains ... The extensive and enigmatic mound settlements are perhaps the most extraordinary feature to be found in Australian archaeology (Witter 2004:140-2).*

### 1.1 BACKGROUND TO THE STUDY

This thesis focuses on the ‘mounds’ or mounded cultural deposits that characterise the Hay Plain archaeology and form extraordinary landscape features on the seemingly endless and often treeless plains. The Hay Plain, on the Lower Murrumbidgee and Lachlan Rivers, Southeast Australia (Map 1.1), is in the process of being re-evaluated as archaeological research over the last 12 years confirms the significance of this landscape;

*It is a region of vast alluvial plains ... The extensive and enigmatic mound settlements are perhaps the most extraordinary feature to be found in Australian archaeology. The scale of these mound sites suggests that this region was the population centre of Aboriginal Australia... future research in this region is likely to give a very different picture of Aboriginal culture than is generally accepted elsewhere in Australia (Witter 2004:140-2).*

I initially visited the Hay Plain in the mid 1980’s to undertake a small survey on the Murrumbidgee River at Hay where I recorded middens and scarred trees, then went away and thought no more about it. At this time only 3 other sites were recorded over the whole 20,000 km<sup>2</sup> of the Hay Plain and archaeologists are on record as describing the landscape as ‘seen by our blinkered eyes to be empty...because we drive *through* it on our way to other places’ (Pardoe et al. 1993), as being of no interest because “we were looking for Pleistocene lunettes” (Ron Lampert pers. comm. 1995), and ‘the Hay Plain, it must be one of the most boring places in the Australian landscape...like a ...sea of clay plain’ (Jim Bowler quoted in Douglas 2002:77). However, the flatness is found to be no deterrent now everyone has a GPS in their hand; it is flat but **not** empty (Pardoe et al. 1993).

In 1992 the Hay Local Aboriginal Land Council (LALC) demanded that some action be taken to protect the many burials that were being exposed by erosion, rabbits and other disturbances on the Hay Plain. They requested that NSW National Parks & Wildlife Service (NPWS) record and provide conservation protection for burials they had located away from the rivers on the flat, apparently featureless plain. This dry, mostly treeless plain proved to contain numerous burials, large complexes of mounds, as well as other unexpected material such as microblade workshops (Johnston & Littleton 1993, Littleton 1993, 1994a & b, 1995a & b, Pardoe et al. 1993). As a result, I was contracted in 1995 by NSW NPWS and the Hay Local Aboriginal Land Council to undertake a burials management project and to excavate a section of the large Tchelery 1.1 mound.

The 1995 work enabled me to glimpse the complexity of the archaeology of the “Hay, Hell and Booligal” laconically described by the poet Banjo Patterson. In brief the survey results indicated that areas in the west of the Hay Plain are dominated by very large mounds and mound complexes, associated with burial clusters and microblade technology. The eastern side of the Hay Plain displayed large artefact scatters and ovens along palaeochannels with a range of stone technologies including blade and pebble tool technology, contradicting previous assumptions about the lack of stone and stone reduction strategies on the Hay Plain. Along the modern Murrumbidgee and Lachlan Rivers, smaller mounds, ovens, middens and ashy archaeological deposits, and isolated burials or small clusters of burials were found (Martin 1996 a, b).

Due to the unexpected withdrawal of funding the Hay Plain Burial project was completed only to draft report stage and the Tchelery excavation materials remained unanalysed. This thesis was born out of my frustration at lack of action from various government agencies, and the fact that the Hay LALC, community, and myself, my family and friends, were all hooked by the mirages and magic of the Hay Plain. I was aware that the summary of the archaeology of the Hay Plain produced in 1995-6 was inadequate and masked complexities that were yet to become apparent. A paper given at the 1996 Australian Archaeological Association conference in Adelaide summed up the situation and concluded:

None of the possible functions of mounds discussed [in this paper] appear to fully explain all of the mound characteristics. Some of the functions suggested are at best only secondary (eg. burials), and others do not explain the consistent round to elliptical and domed shape of the mounds and extraordinary height of some, the

variation of components even within one complex, the spatial patterning of mound complexes, the burial patterns and the microblade technology. ...

The mound complexes contain evidence that reflect the exploitation of a range of environments, but more importantly they are evidence frozen in time of the unique social organization that was behind it all. While we need to continue research into the physical evidence of the mounds it is time to broaden the scope of the research and try and fit this evidence into what we know about the changes in social organization and use of technology that apparently occurred in some Australian environments during the last 5000 or so years. ... We have to be aware that just as not all cemeteries are the same, not all mounds are the same, and may have had a variety of uses, and may vary considerably from one landform to the next ... Researchers have tended to look for a purely economic function to explain the mounds, but a social factor is more likely to be the reason for the distinctive shape and clustering of the mounds (Martin 1996c).

I therefore began this study with few facts and many questions. An initial literature review of mounds in Australia indicated that although everyone has a favourite explanation for the mound phenomena, none of them provided explanations for the distribution, spatial patterning, structure contents, size and shape of the Hay Plain mounds. Much research on mounds has relied heavily on either ethnographic or environmental models and often floats detached from the rest of the archaeology in the area. A more transparent theoretical approach and models that could be tested against data became the major aim of this study. At the same time the overseas literature held convincing clues that mechanisms of world-wide application were involved in the phenomena of mounds, often called 'burnt', 'fire-cracked rock' or 'black earth' mounds in North America and Europe. The role of heat retainer technology offered a single explanatory model for all mounds and became a focus of the research. I examined the range of theory and specific models that had been applied in Australia to the mound enigma, and additional models that could be applied. Taking a quote from Lourandos (1997:4) I began looking for '*possibilities and relationships*' to unravel the complexities of the archaeological record.

## 1.2 DESCRIPTION OF THE HAY PLAIN

This study focuses on the Hay Plain encompassing the Lower Murrumbidgee and Lachlan Riverine Plain, an extremely flat sedimentary basin forming part of the Murray Riverine Plain of South-Eastern Australia (Figure 1.1). The Hay Plain is

centred on the town of Hay on the Lower Murrumbidgee River. It has various definitions, but for the purpose of this thesis it includes the Riverine Plain as far north as the Lachlan River around Booligal and Oxley, as far south as Forest Creek near Moulamein, to the east of Hay as far as Carrathool, and west as far as Yanga Lake near Balranald (Figure 1.2). This is an area of approximately 20,000 km<sup>2</sup>. The large size of the study area and lack of definitive natural boundaries necessitated dividing the area into smaller areas for sampling and descriptive purposes. The Cobb Highway was used to divide the area arbitrarily into west and east, and the Murrumbidgee River channel divided it into north and south. The distinctive natural area called the Lowbidgee (Lower Murrumbidgee), the eastern section of the Murrumbidgee, and the plains, were thus divided into: Lowbidgee, Murrumbidgee East, Hay Plain Southwest, Hay Plain Southeast, Hay Plain Northwest, and Hay Plain Northeast (Figure 1.2). The Hay Plain takes in the central and western part of the Murrumbidgee Province and the southern side of the Lachlan Province of the Riverina Bioregion (Eardley 1999). The area of interest was originally determined by the Hay Local Aboriginal Land Council, and comprises the Land Council area plus some areas at the edges over which they had negotiated a heritage management caretaker role (principally for burial sites) with neighbouring Land Councils. These areas at the edges of the Land Council boundary were considered to belong to the 'Hay Plain' as defined by the Hay Aboriginal community, and to form a cultural landscape they identified with.

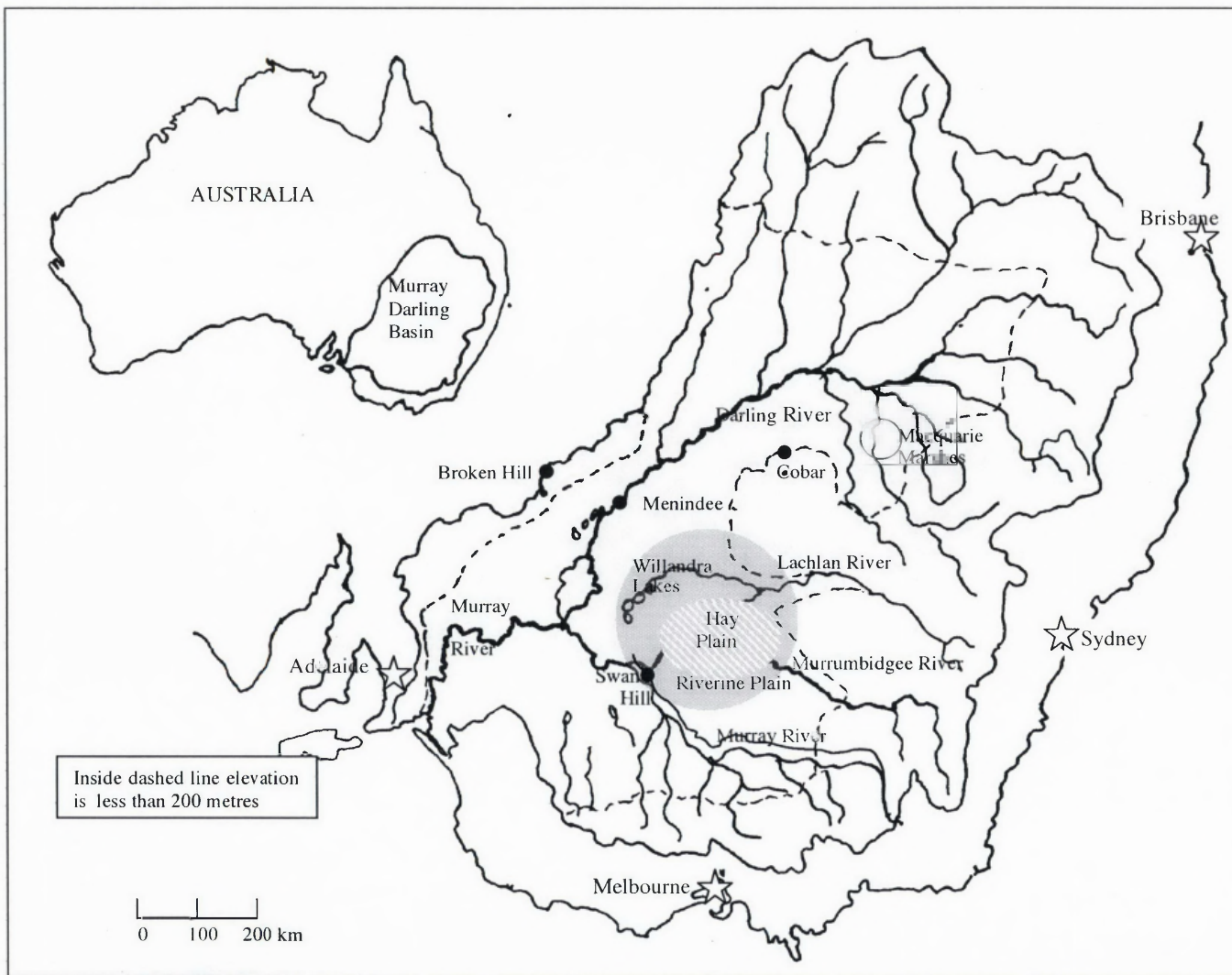


Figure 1.1 : Murray Darling Basin, Riverine Plain (grey) and Hay Plain

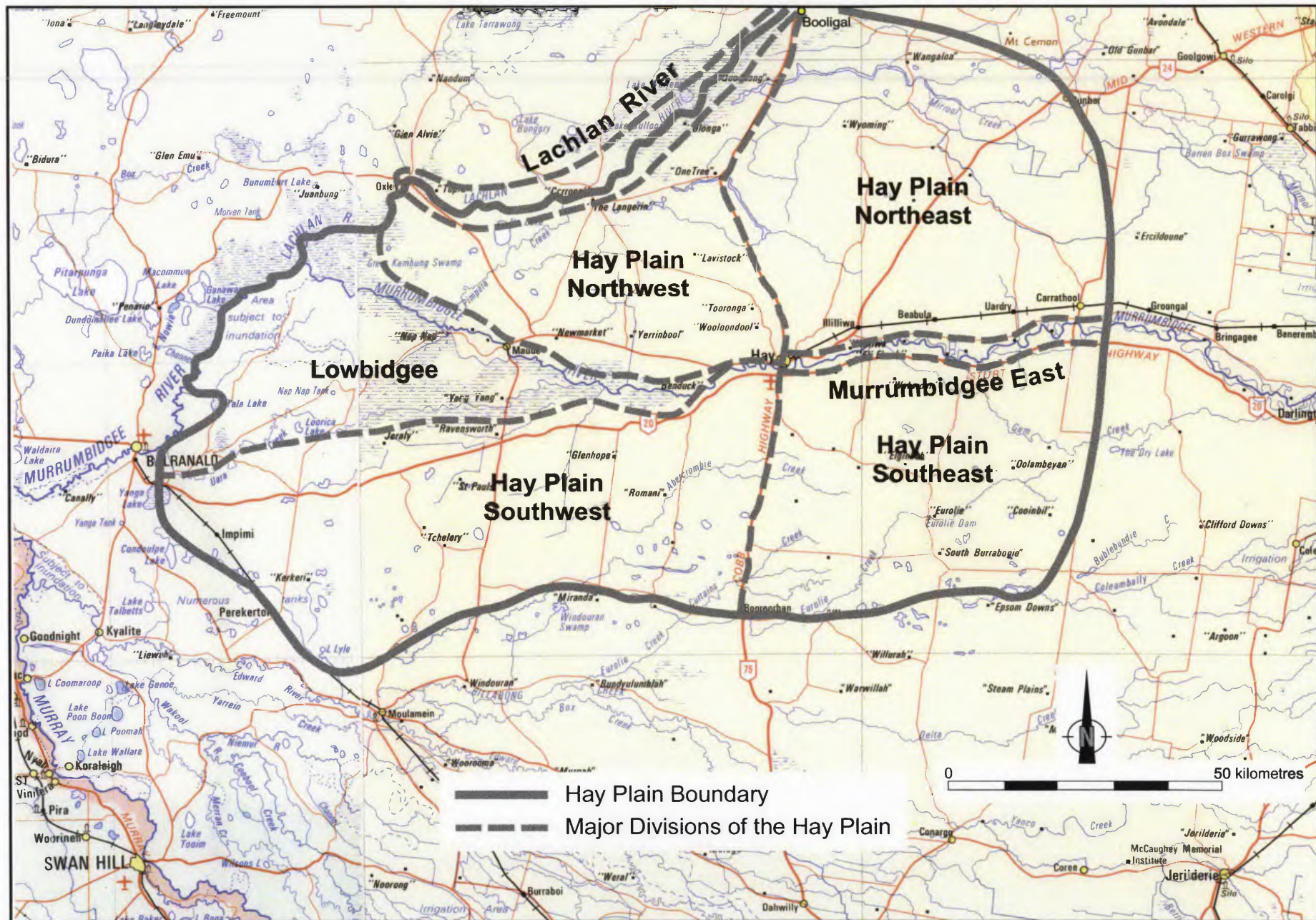


Figure 1.2: Divisions of the Hay Plain

The climate is semi-arid with high evaporation and a winter rainfall maximum. However, winter and spring rainfall and snow melts from the highlands to the east discharge through the network of rivers, creeks, anabranches and distributaries that traverse the plain and channel water towards the Murray River for eventual discharge into the southern ocean. Prior to the water control system now in place the spring snow melts provided consistent annual flooding, a significant factor affecting the archaeology. The Hay Plain has an average gradient of only 20cm/km and is well known for its flatness and vast chenopod dominated plains (Soil Conservation Service NSW 1990). It consists of clays, silts and sands of mainly fluvial origin and its primary surface features result from the evolution of the river systems through the Pleistocene and Holocene periods. The modern rivers of the Hay Plain are the Murrumbidgee and Lachlan, both narrow, incised and very sinuous and characterised by suspended-load clays and silts. Palaeochannels that carried water and a sandier sediment prior to and throughout the last glacial period can now be seen as wide channels of sand often slightly raised above the average level of the plain, and associated levees and source-bordering dunes. The shallow, sometimes tree lined, palaeochannels may be 'captured' by modern creeks and thus still carry floodwater. Palaeochannels affect the topography and geomorphology, and therefore influence the modern rivers, creeks and wetland habitats (Kingsford 2003, Page et al.1996, Page et al. 2005). Interpretation of the influence of environment on the archaeology has to factor in the complex and subtle relationships between the myriad palaeofeatures and the more recent Holocene landscape.

### **1.3 AIMS OF THE STUDY**

This study aims to examine the spatial, temporal and socio-cultural relationships evidenced by the mid to Late Holocene archaeology of the Hay Plain, and relate this to models that can be applied to other areas of Australia and the world. The study focuses on the mounded cultural deposits, often called black earth mounds, or just 'mounds', that are very common on the Hay Plain and in places constitute the only visual landscape features. A range of evidence is examined, including the role heat retainer technology, the relationship between mound location and environment, chronology and change, and the role of mounds as an element in the cultural landscape. The vast area of the Hay Plain was chosen as a research area because it is only at such a large scale that some of the potential questions and answers become

evident. The archaeology of areas with and without mounds were sampled to provide testable evidence of causal relationships. Two areas in landforms off the Hay Plain were also sampled to further test the models applied to the Hay Plain. Only one other study focussing on mounds (Klaver 1998) has looked at an area sufficiently large to provide data on mound regional distribution and variation. Smaller studies in adjoining areas including the Murrumbidgee River to the east of Hay (Klaver 1998), the Wakool, Edwards and Murray Rivers to the south (Bonhomme 1990a, Edmonds & Long 1998, Coutts et al. 1979), and the Macquarie Marshes to the north, provided comparative data that broadened out the scope of the study.

This study also aims to demonstrate how archaeological theory and resulting models of change in the archaeological record are essential tools for structuring research. Coherent and non-circular arguments must be developed from a transparent discussion of theory and models. This makes it possible to ask questions about dynamics of changes in human behaviour and for future researchers to build on the research. The theory and models underpinning research are seldom explicit in studies focussing on mounds. For example, one explanation for mounds is that they were built on regularly waterlogged ground to provide dry campsites (Williams 1988). This explanation may be a factor, but it does not stand on its own. It does not explain why people decided to build mounds in such areas in the first place, and it does not explain the spatial patterning, size, and contents of mounds, or the variation between mounds. However, more recent work has attempted to address and test models such as the ‘unilinear development model’ (Klaver 1998), that is : are mounds a result of the increase in intensity of resource use and complexity of technology and social organization described by Lourandos (1985) and others?

In Chapter 2 I review previous work on Australian mounds and mid to late Holocene socio-cultural change, and examine the theoretical approaches and explanatory modelling employed. Some of these models, such as variations of the ‘intensification’ model, provide a useful tool for examining changes in human behaviour on the Hay Plain over the last 5,000 years. I found however, that questions about the shape, size and clustering of mounds could not be answered by using these existing avenues for research. Literature on interpretative archaeology was reviewed to find new methods and models that I was able to employ in this study to explain some of the variations seen in the archaeological record of the Hay Plain. On another scale, I became interested in finding a common thread between all mounds in Australia, in order to

explain the distribution of mounds in tightly bounded spatial and chronological patterns in widely separated areas of Australia. Heat retainers of various materials are found in mounds in all areas of Australia, a fact that is documented by previous researchers. However, previous research has not questioned this commonality, or investigated the global history of heat retainer technology and applied it to mounds in Australia. Early contact historical descriptions provide eye-witness accounts of heat retainer cooking in the mounds on the Hay Plain and the adjacent Murray Riverine Plain (Chapter 4), defining the complexity and diversity of this technology. This thesis contributes a detailed understanding of why people use heat retainers and global trends in their use, thus providing a generalised explanation of mound distribution in Australia.

## 1.4 A BRIEF INTRODUCTION TO 'MOUNDS' IN AUSTRALIA

### 1.4.1 *What are Mounds?*

The characteristics of the Hay Plain mounds are discussed in more detail in the later chapters of the thesis. However, this brief introduction is sufficient to define this type of feature and distinguish it from other types of mounds frequently considered in the Australian archaeological literature, including the megapode incubation mounds, shell mounds and shell middens discussed in the following sections.

The mounds researched in this study are variously called 'earth mounds' (Balme & Beck 1996, Lourandos 1997), 'mounds, ovens or oven mounds' (Bonhomme 1990a). Literature referring to 'mounds' is mainly focussed on the Southwest Victorian basalt plains (Lourandos 1997, Williams 1988) and the Murray Riverine Plain and Murray-Darling tributaries in Victoria and New South Wales (Balme & Beck 1996, Berryman & Frankel 1984, Coutts et al. 1979, Klaver 1998, Pardoe & Martin 2001), although recent research on the Lower Murray and the Adelaide Plains deltas have widened the scope of this research (James Knight pers. comm. 1998, Wood 1995) (Figure 1.3). Similar features are also found around freshwater swamps of the northern Australian coastal plain, notably in the Arnhem Land region (Peterson 1973, Roberts 1994, Brockwell 1996). I will consider all of these 'mounds' as one archaeological 'type'.

The 'earth' or mound matrix is full of archaeological material such as heat retainers, ash, charcoal, faunal remains, stone tools, and occasionally burials. Even the word

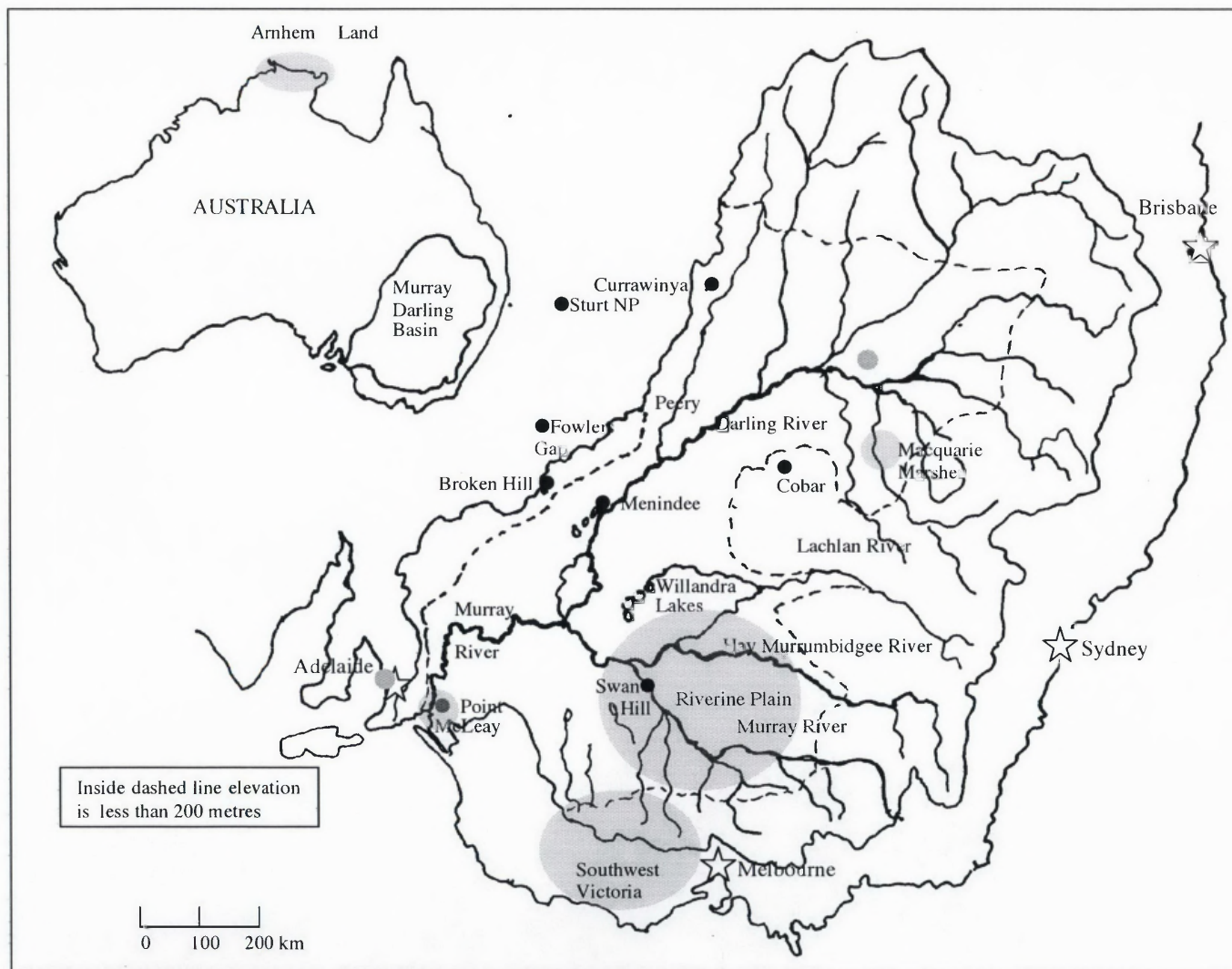


Figure 1.3 : Areas with 'Earth' Mounds Shown in Grey

mound is unsatisfactory as the end result of erosion is a scatter of heat retainers and other erosion resistant archaeological material on what may be termed a claypan. The early ethnographic records and local Hay Plain farmers usually call them 'ovens', 'Blackfella's ovens' or 'oven mounds', although this biases interpretation towards a single mundane function. Local Aboriginal people also call them 'ovens', but are more likely to call them 'camps', unless they have been around archaeologists too much and then they call them 'mounds'. Many Victorian ethnographic records refer to *Mirrn-yong* (various spellings) heaps or mounds (Etheridge 1893:21) referring to *Microseris scapigera* tubers (Gott 1982:63) that were cooked in mounds in some areas.

An aim of this thesis is to find out just what these 'mounds' are, and so the name should not pre-determine the findings. Ovens, camps, earth have been crossed out in favour of 'mounded cultural deposit', following Klaver 1998, or simply 'mounds' for short.

The most obvious characteristics of mounded cultural deposits (mounds) are:

- cultural deposit that is mounded and circular or elliptical in outline
- usually dark coloured, organic rich sediment, the dark grey to black colour due to the addition of ash, charcoal, burnt animal bone or mussel shell, and other organic material possibly including animal fats and plant waxes. Weathering may bleach the deposit to medium to pale grey or grey-brown.
- varying amounts of heat retainers or stone or clay material that have been heated in a fire and then enclosed in an oven to act as a heating element for prolonged cooking. The material of heat retainers varies depending on availability, but is usually baked clay on the stoneless riverine plains, and stone showing heat-induced fractures in areas where stone is available (Williams 1988:189). Individual ovens and ashy deposits in sand-plain country to the west of the Murray riverine plain commonly contain termite nest heat retainers (Pardoe & Martin 2002), as do mounds on the Arnhem Land coastal plain (Peterson 1973). Walls and floor of oven pits can also act as heat retainer.
- a varying range of artefacts including flaked stone artefacts, debitage, ground stone artefacts, chips off edge ground greenstone axes, and bone

points

- a varying range of faunal material, predominantly burnt and fragmented
- some mounds have a secondary function as burial mounds
- erosion or deflation may result in removal of the sediment leaving only a lag deposit of heat retainers and varying amounts of burnt animal bone or stone material (a remnant mound) (Martin 1996a).
- mounds vary in size from length of 2 metres to 180 metres and range in height from a few centimetres up to two metres, and are often clustered in complexes of 20 or more individual mounds (Littleton 1996, Klaver 1998, Martin 1996a, 1996c, Pardoe and Martin 2001).

Mounds grade into other types of sites including:

- exposed heat retainer hearths or pit ovens, composed predominantly of baked clay pieces above a charcoal/ash layer
- exposed heat retainer hearth or pit oven complexes composed of several coalesced ovens, distinguished from mounds by a lack of mounded material
- non-mounded ashy deposit, composed of charcoal, ash, heat retainers, sediment, artefacts and burnt bone
- middens in inland South Eastern Australia are usually lens shaped, rarely mounded or deliberately shaped, but some mounds incorporate enough mussel shell to be called a midden (but see below), and some middens contain minor amounts of heat retainer
- natural sand deposits such as source bordering dunes with varying amounts of cultural material such as baked clay heat retainers, ash charcoal, burnt animal bone, burials, and stone artefacts incorporated into the upper layers of the sandy sediment or mounded on top of the sandy sediment
- burials in natural sand deposits may include some minor charcoal staining from cremations or fires related to burial ceremonies, but may also include minor amounts of cultural material such as baked clay heat retainers or

burnt animal bone

- hut platforms; or deliberately mounded and shaped deposits of sediment that are then lived on (apparently found in South Western Victoria (Williams 1988) but not yet identified in NSW)
- mounds formed from collapsed huts that had mud incorporated into the roof and/or walls (apparently found in South Western Victoria (Williams 1988) but not yet identified in NSW).

#### ***1.4.2 Comparisons with Incubation Mounds***

The mounds of the Hay Plain should not be confused with the various kinds of megapode incubation mounds that have been suggested as the origin of some mounds on the coast of northern Australia (Stone 1989, 1991, but see Cribb 1991, Bailey 1994, Bailey et al. 1994, Veitch 1994 for archaeological evidence refuting Stone's views). The only species of mound building bird found near the Riverine Plain is the mallee fowl, which, as its name implies, lives in the mallee shrubland confined to the Mallee Sandplain to the west of the Riverine Plain (Eardley 1999). Map 2 (Chapter 7) shows that there are small sand islands on the eastern side of the Murrumbidgee near Lake Tala, but that all other sandplain occurs on the western side of the lower Murrumbidgee as part of the Murray Mallee bioregion sandplain, or on the north-eastern edge near Griffith.

Environmental change could not have produced a change in vegetation that would have made the Hay Plain a suitable habitat for mallee fowl, as mallee in south-western NSW is specifically adapted to grow in the distinct sands of the Woorinen Formation (Brown and Stephenson 1991), and does not and cannot grow in the clay rich soils of the Riverine Plain (Eardley 1999). Mallee fowl utilise the coarse, friable, sandy soil and the mallee leaves to make their nests. In addition mallee fowl nests would not contain the substantial amounts of culturally derived charcoal, burnt bone, shell, stone and heat retainer found in mounds, or features such as burials, oven pits or heat retainer clusters.

#### ***1.4.3 Comparisons with Shell Middens and Shell Mounds***

References to mounds may refer to what might be called shell mounds or shell rich mounds along the coastlines, and in particular the northern Australian coastlines

(Bailey et al. 1994, Sullivan & O'Connor 1993, Stone 1989). The mounded cultural deposits (mounds) of the Hay Plain have variable amounts of shell, including the river dwelling species of freshwater mussel, *Alathyria jacksoni* or *condola*, and/or the billabong and lake species, *Velesunio ambiguus*. Mounds may have no shell, or tiny fragments of shell, or, rarely, a substantial amount of shell, but still not more than a maximum 30% mixed in with the usually dark grey or grey-brown deposit. However, even the rare mound with a relatively high percentage of shell will still have the characteristic 'moundedness' and circular or elliptical shape. In a mound the shell does not appear in distinct activity areas or lenses as is the case in a normal midden, but is mixed up in the sediment with the other archaeological material and is normally very fragmented and burnt or calcined. Large shell mounds occur on parts of the northern Australian coastline, and have been the subject of detailed research (Bailey 1994, Bailey et al. 1994, Cribb 1991, 1996, Peterson 1973, Veitch 1994). In Arnhem Land they occur in the same regions as earth mounds, but each type is confined to slightly different locations and habitats (Peterson 1973). Shell mounds have not been recorded on the Hay Plain or the Murray Darling Basin, although shell middens are common.

## 1.5 THESIS OUTLINE

The thesis is organised into nine chapters. In Chapter 2, I review relevant research and place this study within the context of previous research on mounds in Australia. I also examine the theoretical approaches and concepts that have been employed in mound research and some other relevant studies of mid to late Holocene socio-cultural change in Australia. This chapter arrives at a basic research framework incorporating three major themes, each with a different approach and analytical scale. This is refined in Chapter 3 into a series of research questions and testable models. The first theme investigates a generalised explanatory model for the spatial and temporal distribution of mounds in Australia. My own field work and the literature review suggests that heat retainer is the common factor in all mounds and may explain the contents of mounds and their disjunct distribution. In Chapter 4 a detailed analysis of the history and uses of heat retainer technology concludes that heat retainer technology is a global phenomenon that in the mid to late Holocene enabled people to extract maximum energy returns from a range of carbohydrate rich plant foods, which were previously not fully utilised. Chapter 5 details the excavation

of two mounds and three heat retainer ovens, and Chapter 6 provides analysis of the heat retainers and sediments from one mound. These chapters provide detailed examination of the Hay Plain mounds to determine if they are formed by the repetitive use of heat retainers, and outline other activities carried out on mounds, a series of dates for each mound, and a date for each oven.

Chapter 7 provides an analysis of the temporal and spatial distribution of mounds and other archaeological material on the Hay Plain and comparative sample areas. This relates mound distribution to permanent wetland areas and suggests localised movement of mound building related to environmental variables, and outward movement of the idea of mound building. This chapter provides evidence for the second theme; the intertwining of environment, human agency and historical processes, leading to localised and generalised models of the dynamics of human behaviour. Chapter 8 focuses on the third theme, where concepts of interpretive archaeology such as landscape archaeology, style and gender relations, are used as tools to tease out finer details of human agency and historical processes on the Hay Plain. This chapter begins by analysing the mound attributes of size, shape and cluster size to determine if mounds have 'style', follows through into a discussion of the constructed and conceptualised landscape, aspects of social organization, and landscape management and gender relations. Chapter 9 provides a discussion of the results and their relevance to the models listed in Chapter 3. This is followed by a proposed generalised model of mound distribution in Australia, and a discussion that ties the constructed, conceptualised and socialised landscape of the Hay Plain to models of change in the mid to late Holocene. A concluding statement discusses the application of the research objectives and framework, and the effectiveness of the approaches, scales and methods used in the study.