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## Hunter-gatherer social complexity at Roonka Flat, South Australia

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### Introduction

The two phenomena of the appearance of cemeteries and the presence of mortuary differentiation within those cemeteries have been used as indicators of increased sedentism and organisational complexity in past societies. Thus, the analysis of cemetery sites has played a central role in the examination of past social complexity in hunter-gatherer and agricultural societies. As there have been a limited number of well-controlled excavations of pre-European contact cemetery sites in Australia in comparison to other regions of the world, a few key burial sites have emerged as important databases for the study of Aboriginal social change. These include the Willandra Lakes sites in New South Wales (Bowler *et al.* 1970, 1972; Thorne *et al.* 1999; Webb 1989), Kow Swamp in Victoria (Thorne 1971; Thorne & Macumber 1972), Roonka in South Australia (Pretty 1977), and Broadbeach in Queensland (Haglund 1976).

Rescue excavations conducted by the South Australian Museum at the Roonka Flat archaeological site between 1968 and 1977 produced one of the largest, best provenanced pre-European contact Aboriginal burial populations in Australia. The excavations along the eroding sandy banks of the lower Murray River near Blanchetown, South Australia (Figure 1) resulted in the recovery of over 150 interments dated from *ca.* 10 000 BP to 1840 CE (Pretty 1977, 1986), i.e. spanning most of the Holocene. The mortuary variability and elaborate grave goods observed at this hunter-gatherer site suggested the possibility of a non-egalitarian social organisation (Pretty 1977; Pate 1984). Because of the worldwide focus on hunter-gatherer diversity and social complexity at the time, the Roonka Flat site received a great deal of attention from archaeologists and anthropologists in Australia and abroad.

Aboriginal societies were generally regarded as egalitarian by social anthropologists (see review by Hiatt 1986). Meggit (1964) argued that Aboriginal society was intensely egalitarian and had no enduring hierarchy of authority for the administration of public affairs. In contrast, Myers (1980a, 1980b)



Figure 1. Map showing location of the Roonka Flat archaeological site, lower Murray River, South Australia.

argued that Pintupi political life in central Australia involved a co-existence of hierarchy and egalitarianism. Religious authoritarianism as expressed in male cult-lodges existed alongside an egalitarian secular life. Strehlow (1970) supported this latter view in relation to the monopoly of cult-based power held by male ceremonial leaders and old men of authority among the Arrernte of central Australia.

Prior to the early 1980s, the traditional Australian archaeological paradigm depicted Aboriginal culture as relatively homogenous and unchanging. Long-term socioeconomic and demographic stability were inferred from a simple, generalised, conservative stone-tool technology and stable population estimates. Aboriginal people were seen as recent migrants to Australia who adapted to the new continent by achieving a rapid homeostasis or equilibration with various natural environments (see reviews by Mulvaney 1975; White & O'Connell 1982; Beaton 1983, 1990; Lourandos 1985, 1997; Williams 1987, 1988; Mulvaney & Kamminga 1999). Thus, technology and social forces were not regarded as major catalysts for social dynamics and change.

Following the first international conference on hunter-gatherers (the Man the Hunter conference) in 1966, it was widely recognised that hunter-gatherers showed extreme diversity in relation to subsistence practices, technology, and social organisation. Sedentary and semisedentary hunter-gatherer societies with specialised food procurement and storage technologies and stratified social systems were reported for various regions of the world (Lee & DeVore 1968).

In regions of the world where there were reliable water sources associated with abundant wild plant and animal foods, hunter-gatherers could live a settled village life without the use of agriculture. The development of new food extraction techniques, or the intensification of existing subsistence strategies to improve the yields of wild foods combined with food preservation and storage methods allowed hunter-gatherers to accumulate food surpluses. These surpluses were used to even out the distribution of wild foods over the year, thus providing a reliable long-term food source that allowed the development of permanent and semipermanent villages. Social networks and exchange systems provided additional mechanisms to reduce risks associated with long-term variability in food production.

Following an analysis of differential mortuary practices at hunter-gatherer cemeteries in central California in the mid-1970s, Tom King argued that many of the traits previously associated with intensive agriculturalists could also be attributed to sedentary hunter-gatherers. King (1978, p. 228) stated:

Much of California was occupied by hunter-gatherers living under the administration of fairly powerful chiefs who each stood at the apex of an hereditary hierarchy. Economic systems utilizing shell bead currencies and validated by ritual exchange obligations facilitated sharing of subsistence resources over broad areas while maintaining ruling lineages in positions of authority. Rulers were often fed and housed by the ruled and in turn might support specialists in various non-subsistence trades . . . California societies largely approximate 'chiefdoms' or 'ranked societies' rather than 'bands'.

Archaeological research in Australia was influenced significantly by these developments overseas. In the late 1960s Graeme Pretty, Senior Curator of Archaeology at the South Australian Museum, commenced excavations at a large pre-European contact Aboriginal burial ground on the lower Murray River near Blanchetown, South Australia, in order to address hunter-gatherer social complexity via an analysis of variability in mortuary practices. Pretty's research at the Roonka Flat site was modeled after Stuart Struever's (1968) analyses of pre-European contact hunter-gatherer cemetery populations at the Koster site in Illinois, USA. As the central and lower Murray River regions of

Australia were one of the most densely populated areas of Aboriginal Australia, they provided an ideal landscape to address social complexity in hunter-gatherer societies.

Harry Lourandos conducted research in south-eastern Australia to address the impacts of technological and social forces on sedentism and social complexity in late-Holocene Aboriginal Australia (Lourandos 1977, 1980a, 1980b, 1983, 1985). Following Bender (1978, 1981), Lourandos argued that the economic, settlement, and wider cultural changes observed in the late-Holocene archaeological record in Australia were influenced strongly by the development of more intensive and competitive social networks.

The changes are described as closely associated with a restructuring of social relations that placed increasing demands on economy and production. Such processes appear to have resulted in increases in the complexity of social relations and economic growth, semisedentism and, by inference, population sizes (Lourandos 1985, p. 386).

In more recent work, Lourandos (1988, 1993) focused on the key role of intergroup social relations in establishing the context for change within hunter-gatherer societies. He argued that competitive relations between various residential groups associated with access to food resources, raw materials, spouses, exchange partners, and information necessitated the employment of intergroup meetings and ritual ceremonies that functioned to validate, maintain, and enhance the status of local groups within the larger social system (*cf.* Mulvaney & Joyce 1965; McBryde 1984, 1987; David & Chant 1995; Hayden 1996a, 1996b; David & Wilson 1999; McNiven 1999; Bulth 2002). Intensive harvesting and land management practices were required to produce surpluses of key food resources (e.g. eels, fish, yams, cereals) that could be used to support these large intergroup meetings and ceremonies. The social dynamics generated by intergroup competitive relations provided a catalyst for further changes or 'complexification' in hunter-gatherer societies, including the establishment of extensive exchange and alliance networks, craft specialists, ritual leaders, polygyny, more complex economic strategies and facilities, territorial boundaries, and semi-sedentism.

Lourandos' research addressing 'intensification' and 'complexification' has made a major contribution to the evolution of archaeological theory and method in Australian archaeology, culminating with the publication of his book *Continent of hunter-gatherers* in 1997. Research at Roonka Flat provides additional archaeological evidence that supports the development of more complex social relations in late-Holocene Aboriginal Australia associated with increased sedentism, greater intergroup competition, and the maintenance of territorial boundaries.

### Social complexity in the Murray–Darling river system

Large cemeteries are generally associated with semi-permanent or permanent settlements (Rothschild 1979; Chapman *et al.* 1981; O’Shea 1984; Price & Brown 1985; Chatters 1987; Bird & Monahan 1995; Beck 1995). Aboriginal burial grounds are common in the soft Holocene sand dunes, flats and lunettes bordering the Murray–Darling river system in south-eastern Australia (Figure 2). Large cemeteries are concentrated in the lower and central Murray regions, whereas the upper Murray and lower Darling River regions are dominated by smaller burial grounds consisting of clusters of between two to twenty individuals (Littleton 1999). Cemetery sites in the riverine region become larger and denser after 5000 BP (Pardoe 1988, 1994, 1995). The occurrence of these large cemeteries in the lower and central Murray provides archaeological evidence for the presence of semisedentary and sedentary hunter-gatherer settlement systems.

In his paper ‘The cemetery as symbol’ Pardoe (1988, p. 14) argues that the social organisation of the Murray River people ‘was clearly designed at least

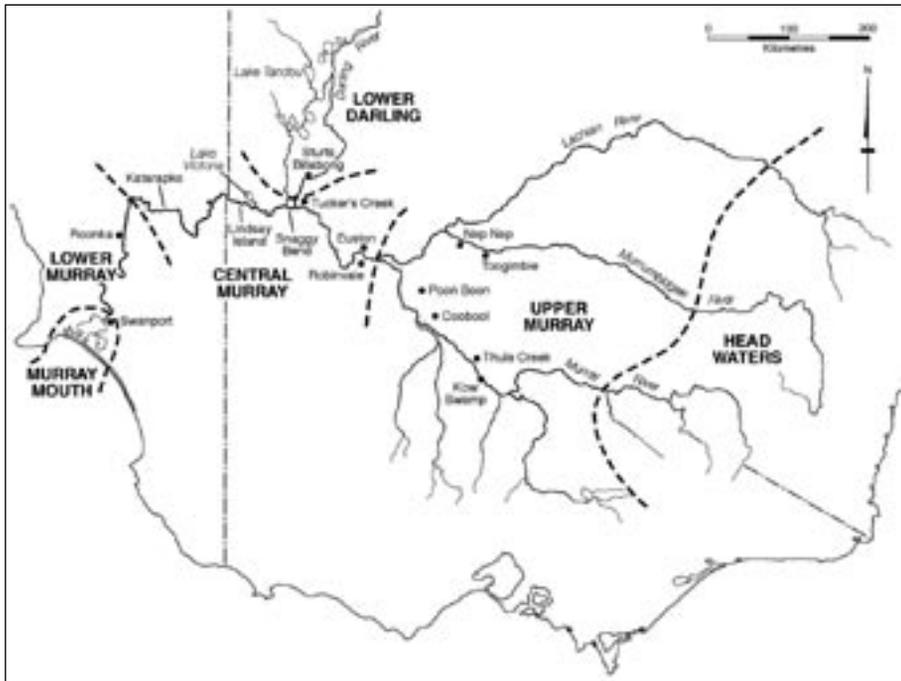


Figure 2. Map showing location of larger Aboriginal burial sites (more than twenty individuals) in the Murray–Darling river system, south-eastern Australia (after Littleton 1999).

partly around some form of corporate descent group'. These corporate descent groups are regarded as territorially based, and their burial grounds provide one of the symbols validating corporate ownership of that territory. Thus, in the late Holocene, large well-defined cemeteries along the banks of the lower and central Murray River provide a mechanism of boundary maintenance for various Aboriginal territorial groups occupying the region.

Stable isotope, palaeopathological, and cranial non-metric analyses of human skeletons recovered from the riverine zone provide additional evidence for increased sedentism and territoriality in this region during the Late Holocene (Prokopec 1979; Hobson & Collier 1984; Pretty & Kricun 1989; Pate 1995, 1997, 2000; Webb 1995; Pardoe 1994, 1995).

### Stable isotope analysis

Stable carbon- and nitrogen-isotope analysis of collagen derived from small 0.5–1 g pieces of bone provides an indication of geographic source of dietary protein and access to foods from various habitats from the coast to inland regions. Analyses of human bone samples from the coastal Coorong and Murray-mouth regions, the riverine Swanport area, and the riverine Roonka area provide strong evidence for the existence of sedentary, territorial social organisations along the lower Murray River and adjacent southern coastal regions of South Australia during the late Holocene. Stable isotope results indicate that neither significant amounts of foods nor people were moving across the various boundaries of the corridor stretching from the coastal Coorong and Murray River mouth in the south to the inland riverine Swanport and Roonka sites toward the north (Pate 1998a, 1998b; Pate *et al.* 2002).

Stable carbon- and nitrogen-isotope analysis of bone collagen from late-Holocene human remains recovered from various cemeteries in south-eastern South Australia provide isotopic signatures that distinguish the following geographic regions: the coastal Coorong; the coastal Murray River mouth, Adelaide–lower Murray River; and the upper Murray River.

The first regional group, the coastal Coorong, has the most positive  $\delta^{13}\text{C}$  and  $\delta^{15}\text{N}$  values in relation to high levels of seafood intake. The second group, from the Murray River mouth, shows intermediate  $\delta^{13}\text{C}$  and  $\delta^{15}\text{N}$  values due to consumption of marine and terrestrial foods. The third and fourth groups, the Adelaide–lower Murray River and upper Murray River regions, have the most negative  $\delta^{13}\text{C}$  values reflecting a predominantly terrestrial diet based on  $\text{C}_3$  plant foods and animals that fed on  $\text{C}_3$  plants. However,  $\delta^{15}\text{N}$  values are more positive in the inland semi-arid Roonka population than they are in the temperate Adelaide–lower Murray region (Pate *et al.* 2002). These distinct regional isotopic signatures, which are related to long-term dietary intake, provide strong evidence for the limited movement of foods and people between

the various environmental zones and associated social territories throughout the late Holocene.

In addition, stable-isotope data from the Roonka Flat population indicate that adult males had diets that were significantly different from those of adult females and subadults (individuals less than fifteen years of age). In comparison to adult males, adult females and children included greater amounts of  $\delta^{13}\text{C}$ -depleted foods such as aquatic and terrestrial plants and freshwater shellfish in their diets (Pate 1998a, 1998b).

### Palaeopathology

Webb (1995) provides an overview of the distribution of human pathological conditions in middle-late Holocene Aboriginal Australia. The study examined six ecological zones: South Coast; East and Southwest Coasts; Central Murray; Rufus River; Desert and Arid Area; and Tropical Area. The pathological conditions assessed include chronic and acute stress (cribra orbitalia, dental enamel hypoplasia, Harris lines); infectious disease; osteoarthritis; and trauma.

Aboriginal populations that occupied the Desert Arid continental interior were generally the healthiest, whereas those from the Central Murray region were the least healthy. Arid-land inhabitants had the lowest incidence of cribra orbitalia (anaemia), dental enamel hypoplasia, and Harris lines. Thus, chronic malnutrition, parasitic infection, and population aggregation would have been minimal in the arid zone. In contrast, the Central Murray shows a high incidence of cribra orbitalia and dental enamel hypoplasia in children and adults, but a low incidence of Harris lines. This pathological profile indicates that Central Murray populations were subject to chronic stress. Harris line formation was most likely suppressed by this persistent stress. After considering the archaeological evidence relating to the dense occurrence of large oven mounds in the Central Murray, Webb argues that the health pattern for this region reflects that of large, sedentary populations with high frequencies of malnutrition, parasitism, non-specific infection, endemic (non-venereal) treponematoses, and mechanical stress associated with increased workload. Thus, the Central Murray populations provide a health pattern similar to that of settled agriculturalists (*cf.* Cohen & Armelagos 1984a, 1984b).

### Cranial non-metric traits

Analyses of thirty-five cranial non-metric traits (Pardoe 1994) at a large number of burial sites along the Murray River also support the existence of 'exclusive' social relations and territoriality during the late Holocene. Non-metric traits are minor features of skeletal morphology that are classed as attributes

rather than measurements, i.e. they are recorded as either absent or present. Multivariate analyses of these traits provide patterns of variation associated with different geographic populations. Differences between geographic populations are calculated and provide a matrix of biological differences or distances. On the basis of biological distance, as determined by cranial non-metric traits, biological diversity is much greater along the Murray River than elsewhere, and gene flow between territorial groups along the river was minimal during the late Holocene. These data suggest that there were well-defined boundaries between various territories along the riverine zone that were maintained by social practices of exclusion (Pardoe 1994, p. 188).

### Mortuary practices

The use of a range of skeletal orientations in the burials at Roonka provided one means of differentiation of the various individuals interred there. Furthermore, the burials at Roonka contained a range of grave goods suggesting the use of material culture as an additional means of signalling differences in social status during life. Some burials included a large number of grave goods and elaborate ornamentation that suggested the possibility of social roles during a past life that required greater economic input at time of death. Prior to the Roonka excavations there was only limited evidence for extreme mortuary differentiation on the basis of burial mode and the association of grave goods in pre-European contact Aboriginal Australia.

### Lower Darling River burial sites

A number of Aboriginal burials were found eroding from an aeolian lunette at Lake Nitchie along the lower Darling River anabranch north-east of Lake Victoria (Macintosh *et al.* 1970; Mulvaney & Kamminga 1999, p. 37). The best-preserved burial was excavated and it produced the first evidence for the presence of elaborate grave goods with pre-European contact Aboriginal inhumations in Australia. The Lake Nitchie burial consisted of an adult male skeleton crammed into a narrow circular pit in a contracted position. A long necklace constructed from the pierced teeth of an extinct marsupial carnivore *Sacrophilus* (Tasmanian Devil) was found around the neck of the skeleton and draped over the chest. Additional grave goods included pieces of pearl shell and a tektite (fused silica related to meteor impact). The skeleton had been covered with red ochre and the remains of a small fire were adjacent to the burial. Pretty stated that 'This discovery cast a completely new light on Australian mortuary practice as it was understood' (1977, p. 324). The skeleton was later radiocarbon dated to 6820 ± 200 BP (Macintosh 1971).

### Central Murray River burial sites

Blackwood and Simpson (1973) reported the use of a range of burial orientations at seven late-Holocene Aboriginal burial sites along the central Murray River between Mildura, Victoria, and the South Australian border and at one site at Lake Victoria, New South Wales. Of the seventy-two skeletons recovered, sixty-seven retained enough burial integrity to determine orientation of the skeleton. Of these sixty-seven burials, twenty-seven were extended supine, one extended prone, two extended on side, ten flexed prone, fourteen flexed on right side, four flexed on left side, and eight squatting. No artefacts or personal possessions were reported as associated with the burials. The skull of one skeleton from the Lake Victoria site was adorned with a gypsum 'widow's cap'.

In contrast, grave goods including plaster 'widow's caps', bone awls, stone scrapers, and freshwater shellfish had been recorded previously in the region during the recovery of over 800 Aboriginal burials from sand dunes along the central Murray River by the pastoralist George Murray Black from 1943–50. Unfortunately, the Murray Black Collection was removed without the use of the detailed recording practices associated with professional archaeology. Thus, there is limited information regarding spatial relationships between buried skeletons and associations of grave goods with individual burials (Sunderland & Ray 1959).

### Lower Murray River burial sites

A large late-Holocene Aboriginal burial ground was discovered at Swanport near Murray Bridge, South Australia, by Crown Lands Department workers in 1911 during swampland reclamation (Stirling 1911; Pate *et al.* 2003). Over 135 individuals were recovered from the site. Unfortunately, the portion of the site that contained the majority of the burials had been disturbed by the workers prior to the arrival of Mr FR Zeitz from the South Australian Museum. The bones had been indiscriminately placed in a large hole or shovelled into the trucks with sediment. Consequently, the individual identity of each skeleton and its position in the burial ground were lost. Bones of dingoes, kangaroos, possums, bustards, pelicans, turtles, and fish were also found heaped with the human material. The faunal bones may have been associated with either the burials or the kitchen middens.

Zeitz recorded the stratigraphic positions, burial postures, and associations of grave goods for sixteen skeletons following his arrival at the site. Most of the inhumations consisted of single adults placed in a sitting position with knees drawn up to the chest. Some had been placed in this position on their sides. None of the burials were extended. Group burials contained only two

individuals and usually consisted of an adult and a child. Crania and the small bones of the hands and feet were often missing from the grave pit. Grave goods consisted of two kangaroo fibulae awls, one quartzite graver, stone flakes, hammerstones, and oven/hearth stones. Several of the graves included large oval slabs of a composite material consisting of sand, white earth, small fragments of limestone, burnt clay, broken mussel shell, and pieces of charcoal. The largest slab measured 53 cm x 38 cm and was 13 cm thick.

In addition, five bone points were associated with one of three Aboriginal burials recovered at Tartanga along the lower Murray River south of Roonka, but grave goods were absent with three burials at the nearby Devon Downs site (Hale & Tindale 1930). The skeleton of a six-month-old dingo and vegetal mats were associated with three burials at Fromms Landing (Mulvaney 1960; Mulvaney *et al.* 1964).

## **Social complexity at Roonka Flat**

### **Archaeological excavations**

The Roonka Flat archaeological sites are located on a 350 ha sand flat on the western bank of the Murray River 7 km north of Blanchetown, South Australia (Pretty 1977; Pate 1998c, pp. 204–5). Pretty excavated four 15 m x 30 m units (Trenches A, 1A, B, 1B) and six smaller trenches (0A, 0A1, 0B, 2A, 3A, 3B) at various localities on the Roonka Flat. Lenses of ash, charcoal, and freshwater mussel shells are the dominant cultural components at these open-air sites. Limestone oven stones are the predominant stone artefacts. Bone and stone tools and faunal remains are not well represented. The most common features are the remains of fireplaces. Radiocarbon dates on occupation debris indicate that the first Aboriginal use of Roonka Flat was at approximately 18 000 years BP.

In addition to cooking refuse, Roonka Flat Dune Trench A exposed an extensive Aboriginal burial ground. Trench A was divided into eighteen 5 m x 5 m units and excavated vertically at 3 cm levels until basement clays were encountered at approximately 6–7 m. Most of the human skeletons were concentrated in a 15 m x 30 m x 2 m area of the trench. The absence of refuse in the lower levels of the trench suggests that the dune was used exclusively as a burial ground from *ca.* 10 000–7000 years BP. Thereafter, camp debris occurred in burial pit fill and in sediments adjacent to the burials.

The Trench A subsample consisted of 147 skeletons with the following temporal distribution: 10 000–7000 years BP (23); 6000–4000 years BP (16); 3000 BP–1840 CE (82); and undetermined (26). Many of the late-Holocene burials were lost to aeolian erosion at the surface of the dune.

## Mortuary variability

Approximately 60% (53/90) of the Trench A adults that could be sexed were male (Prokopec 1979). When subadults were present, they often accompanied adults. Forty percent (20/50) of the subadults were placed in group burials with single adults. Over 80% of these adults (10/12) were male. Thirteen of these subadults were infants with a mean age of 2.2 years. These group burials also contain the most elaborate grave furnishings, including ornaments (animal bone and teeth pendants, necklaces, and chaplets), animal skeletons, ochre, bone cloak pins, and stone and bone tools. Six of the remaining subadults occurred in two group burials, while the other twenty-four were buried singly. These latter individuals had a mean age of 7.0 years. New modes of burial were added to existing forms throughout the temporal sequence. Orientation of the body in relation to compass points and location of interment within the burial ground also varied with time (Pretty 1977, 1986; Pate 1984).

Three basic types of burial pits were excavated in the loose sands of the Roonka Flat dune. Shallow longitudinal pits and deep circular shaft pits were used in the early and late Holocene. The shallow pits averaged 114 cm x 36 cm x 21 cm and mostly contained fully extended dorsal burials. Several extended prone burials dated to the late Holocene. The shaft pits averaged 75 cm x 62 cm x 74 cm. It appears that Aboriginal bodies were placed in a vertical, standing position in these deep pits and were then allowed to slump down. Circular-to-oval pits averaging 107 cm x 47 cm x 22 cm were confined to the late Holocene. The bodies buried in these pits had been placed on their sides, and the upper and lower limbs were contracted so that the knees approached the chest and the arms hugged the lower body. Because of aeolian reworking of the sands, little horizontal stratification occurred in the adjacent layers of sand (Pretty 1977, 1986).

In summary, a majority of the early-Holocene burials consisted of adult males associated with a distinct cemetery, whereas late-Holocene interments included an entire age/sex cross-section of the population associated with habitation remains. Modes of burial also changed through time. Early-Holocene burial was dominated by individuals who were placed fully extended in shallow pits or slumped in deep, vertical shafts. Late-Holocene interments occurred in shallow pits in either a fully extended, recumbent-contracted or fully contracted (flexed) position, with approximately 38% of individuals included in group burials consisting of two to five persons per grave pit.

Grave goods were associated with most of the burials. These included a range of stone and bone tools, animal-bone and tooth headbands, necklaces and pendants, animal-bone clothing pins, animal skeletons, freshwater mussel and snail shells, vegetable mats, hearthstones and associated ash and burnt

nuts, seeds, clay and bone, and various ochres. Contact-period burials included items of European origin, such as pearl and metal buttons and clay and metal pipe fragments (Pretty 1977, Pate 1984).

Due to the increased representation of females in the late-Holocene sample, mortuary differentiation on the basis of role or division of labor was addressed. The types of artefacts included as grave goods varied with sex. Ochre, bone projectile points, and stone tools were associated primarily with males, whereas vegetable mats placed beneath the bodies were confined to female and sub-adult burials. Animal bones and mussel shells were associated with both males and females. The association of bone projectile points and stone tools with the male activities of hunting and tool manufacture/maintenance and vegetable mats with the gathering activities of females and subadults is suggested by these differences in grave goods. In addition, there is differentiation based on quantity of grave goods. The majority of the more elaborate graves with greater amounts of grave goods are those of older males.

### Historical accounts

According to historical accounts, the lower Murray region was one of the most densely settled Aboriginal areas of Australia (Eyre 1845, II, p. 317; Taplin 1874, 1879; Lawrence 1968). The artist George French Angas (1847, p. 58) commented:

In this district the natives were very numerous, their encampments being scattered along the narrow strip of ground between the limestone cliffs and the water's edge; there they find plenty of food from the fish, mussels, crayfish, bullrush root and other products of this larger river.

Conflict developed between European pastoralists and Aboriginal hunters from 1838 as the pastoralists drove herds of stock down the lower Murray River corridor. EJ Eyre was appointed as resident magistrate and occupied a government station from October 1841 to November 1844. The station was located at Moorunde, 11 km south of the Roonka Flat. Eyre's journals provide an invaluable source of information about Aboriginal lifeways during this tumultuous period of contact. Eyre (1845, II, pp. 251–89) provides data regarding Aboriginal subsistence and settlement practices. Aboriginal gatherings as large as 400–500 occurred at Moorunde. He noted that settlement sizes changed from season to season according to the abundance of food. During the summer, the river flooded and increased the wetland habitat size for mussels, crayfish, and fish. Summer camps were quite large and consisted of simple brush windbreaks on the banks of the river. In the winter, the populations dispersed into smaller

camps consisting of rockshelters or solid log huts covered with grass and vegetation in response to cold, wet weather and reduced river levels.

The riverine populations exploited a wide range of resources. Fish were netted, speared, captured in weirs and dams placed across smaller streams, and caught with seines made from rush string. Turtles and mussels were obtained by diving; the mussels being placed in a net worn around the neck. Large crayfish — weighing up to 1.8 kg — were speared from canoes or were captured by divers at night. Small crayfish and frogs were taken by waders. Waterfowl were netted and both their eggs and nestlings eaten. The bulrush root was roasted year-round and leaves and stems of other river plants were steamed in stone-earth ovens.

Both animal and vegetable foods were also obtained from the surrounding mallee plains. Emus and kangaroos were speared, netted, or caught in pitfalls. Emu and mallee hen eggs were popular. Other animal foods included stick-nest rats, possums, snakes, lizards, moths, grubs, and white ants. Berries, fleshy fruits, roots, and fungi were gathered from plants. Honey was extracted from banksia cones and beehives. Eyre reports three methods used to prepare foods: broiling on hot coals; baking in hot ashes; and roasting or steaming in ovens.

Furthermore, Eyre provides some information regarding social differentiation on the basis of sex and age and gender-specific subsistence roles. Old men were privileged members of society, and they received the best and largest share of everything (Eyre 1845):

Males generally are generous and liberal to each other in sharing what food they have, but it is not often that females participate in the division. I have seen the men after an hour or two's fishing with the nets, sit down and devour all they had caught, without saving anything for their family or wives, and then hurry about noon to the camps to share in what had been procured by the women, who usually begin to return at that hour, with what they have been able to collect.

In relation to Aboriginal political organisation in the lower Murray River region of South Australia, ethnohistoric accounts report the existence of two separate formal offices of territorial headman (secular) and cult-lodge leader or spirit medium (religious) within local landowning groups. Both of these offices were occupied by dominant, older men (Howitt 1904, Elkin 1938–40, 1945; Berndt & Berndt 1993).

There are a number of detailed historic and ethnographic accounts relating to the socioeconomically complex Ngarrindjeri people, whose country included the area downriver from the Roonka Flat. The Ngarrindjeri peoples consisted of a number of territorial clans that occupied a large triangular area of coastal and riverine land stretching from just above Murray Bridge in the

north to Encounter Bay in the south-west and Kingston in the south-east. This region includes the coastal Coorong, the Murray River mouth, and the lower Murray River in the vicinity of Swanport. The written records include the journals of the missionary George Taplin (1874, 1879); ethnographic accounts of the anthropologists Norman Tindale (1974) and Ronald and Catherine Berndt (1993); and more recent overviews by Graham Jenkin (1979), Steve Hemming, Philip Jones and Philip Clarke (1989), Steve Hemming (1994, 2000), Barbara Salgado (1994), Diane Bell (1998, 2001), Brian Marshall (2003), and Tim Owen (2004).

Taplin (1879, p. 34) estimates that there were eighteen territorial clans or *Lakalinyeri* that constituted the Ngarrindjeri 'confederacy' or 'nation'. Each territorial clan was administered by a group of ten to twelve men or elders, referred to as the *Tendi*. The *Tendi* from each clan collectively elected the *Rupulli* or the head of the entire Ngarrindjeri confederacy. Religion and the powers of supernatural forces played a major role in the maintenance of social order by the *Tendi* and *Rupulli*. Thus, the Ngarrindjeri were landowners who had a centralised and hierarchical government to administer the laws of the confederacy and its eighteen independent territories.

Thus, historical documents provide additional support for increased sedentism and social complexity in the resource-rich region along the lower Murray River. On the basis of these accounts it can be hypothesised that some older men (e.g. headmen, or cult-lodge leaders: the *Tendi*) may have been treated differently in death than other members of the society. Archaeology provides the time depth that allows the testing of this hypothesis over various periods of time, e.g. the early Holocene (10 000–5000 years BP) versus the late Holocene (5000 years BP to the present). For example, at Roonka Flat the majority of the more elaborate graves are those of older males throughout the Holocene period. Thus, mortuary differentiation at Roonka can be employed as one line of evidence to support increased Aboriginal social complexity in the lower Murray River region of South Australia.

## Discussion

Several independent forms of data suggest increased territoriality and social complexity in the lower Murray region in the vicinity of Roonka Flat during the late Holocene. Mortuary practices at Roonka also suggest some differential treatment of older men in the early Holocene.

At Roonka Flat, mortuary practices provide indicators of social differentiation in three areas: gender roles related to subsistence activities; some specialised hierarchical role for older men; and differential treatment of older men not being extended to their wives or children.

In addition, stable-isotope analysis indicates that adult males had diets that were distinctly different from those of adult females and children. Thus, distinctions in diet and mortuary practice appear to be restricted to the variables of age and sex and are not extended to individuals based on their social or family relationships to higher status persons. This suggests that a highly stratified non-egalitarian system of social differentiation like that associated with hereditary chiefdoms was not employed at Roonka (see Binford 1971, pp. 19–20; Saxe 1970, 1971; Peebles & Kus 1977). However, some form of ranking based on sex and age was clearly operating at Roonka. The greater mortuary attention associated with older males at Roonka throughout the Holocene provides archaeological evidence for the possible existence of male authoritarian roles such as headman, law-man, cult-lodge leader, or sorcerer.

The limited number of well-provenanced excavated burial sites in the lower Murray region places major limitations on analyses of social complexity employing mortuary practices and biological anthropology. Because a majority of the Roonka Flat burials were excavated from a single 15 m x 30 m unit (Trench A), intra-site spatial variability is difficult to assess. Furthermore, as Roonka Flat is the only well-documented prehistoric mortuary site in the region, inter-site variability cannot be assessed. In other words, the Roonka Flat burial ground may not represent the total range of mortuary behavior associated with past local and/or regional social systems. Consequently, analyses of prehistoric mortuary differentiation in the lower Murray River valley are currently restricted to a limited number of variables relating to intra-site behavior at Roonka Flat, e.g. age, sex, pathology, genetic variability, diet, treatment of body, mortuary facility, and grave furnishings (Pate 1997, p. 111).

Nevertheless, research at Roonka Flat provides valuable data that contribute to ongoing debates regarding the context, timing, and causes of the development of more complex hunter-gatherer social relations in Australia and other regions of the world.

Evidence from Roonka for increased sedentism, greater intergroup competition, the maintenance of territorial boundaries, and social ranking based on sex and age complement archaeological research from other regions of Australia in relation to complexification during the late Holocene. Furthermore, mortuary evidence for differential treatment of older men in the early Holocene suggests that the emergence of male authoritarian roles in the lower Murray region may have preceded the development of intense territoriality and boundary maintenance.

Finally, the Roonka research challenges traditional perceptions regarding the long-term survival of an egalitarian, nomadic, culturally homogenous, and static Aboriginal society. It complements a growing body of research addressing complexification in Aboriginal Australia that is providing valuable data

to deconstruct these resilient European myths. Such research has important implications for our views of past cultural diversity in Aboriginal Australia and their relation to ongoing negotiations regarding the roles of Aboriginal peoples in contemporary Australian societies.

### **Acknowledgements**

I am grateful to the late Colin Cook, former chairman, Gerard Reserve Council, and the late Graeme Pretty, former senior curator of archaeology, South Australian Museum, for their long-term efforts associated with the development of an inclusive archaeological research in South Australia. Richard Gould and Doug Anderson (Anthropology, Brown University), Margaret Schoeninger (Anthropology, University of California, San Diego), Keith Norrish and the late John Hutton (CSIRO Soils, Adelaide), Ken Brown (Dentistry, University of Adelaide), Jack Golson and the late Rhys Jones (Prehistory, Australian National University), and Donald Munns (Land, Air and Water Resources, University of California, Davis) played key roles in my MA, PhD, and postdoctoral research at Roonka Flat. Bruno David provided valuable comments regarding the development of the manuscript. My research at Roonka has been funded by various institutions, including the South Australian Museum, the Australian Institute of Aboriginal and Torres Strait Islander Studies, the Australian Research Council, the Wenner-Gren Foundation for Anthropological Research, the Sigma Xi Scientific Research Society, the Australian Institute for Nuclear Science and Engineering (AINSE), Brown University, Harvard University, the University of Wisconsin (Madison), the University of Adelaide, the Australian National University, and Flinders University.