

## 4

## ARCHAEOLOGICAL CONTEXT

Archaeological evidence demonstrates that the Aboriginal people observed in Sydney at European settlement had not remained unchanged throughout the Holocene. The social dynamic identified by the relatively sparse European observations must be seen in terms of an increasingly complex understanding of the region's late Holocene record.

Temporal and spatial trends in occupation patterns are pertinent to the rock art analyses undertaken here, and these are summarised. In the original thesis most of the regional temporal trends came from rockshelter sites. Val Attenbrow's work in Upper Mangrove Creek catchment (UMCC - 1987, 2004) formed the focus of this, since occupation trends in rockshelter use contextualize the diachronic art analyses.

Attenbrow's 1987 UMCC work focused on 31 habitations. In 1994 this was the most comprehensive data set for the region, demonstrating as it did, the variability within a local catchment using sites from a range of landscapes. Since 1994, more than 50 open sites on (mainly) the Cumberland Plain have been excavated as a result of cultural heritage management projects. These open area excavations currently target c. 100 square metres (following systematic testing) in representative landscapes. The number and variety of sites investigated, and the sheer size of the assemblages retrieved from these Cumberland Plain sites (Table 4.1) provides a stark contrast to the 19,400 artefacts from 16.5 square metres excavated in UMCC (Attenbrow 2004: Tables 3.4 and 4.6).

**Table 4.1: Open Site excavations on the Cumberland Plain since 1993, showing areas excavated (testing and open area), total lithics and artefacts retrieved**

Location	Site	Total area m <sup>2</sup>	Total artefacts	Total lithics	Reference
RHDA* Second Ponds Creek	OWR2	104	743	n/a	JMcD CHM 2005d
	RH/SP12 South	387	19,280	22,860	
	RH/SP12 North	148	1,522	2,004	
	RH/SP13C	120	175	251	
	RH/SP13G	151.5	1,954	2,427	
	RH/SP20	76	27	38	
	RH/SP21	153	194	209	
	RH/SP22	175	3,491	4,453	
	RH/SP13J	35	184	189	JMcD CHM 2004a
	RH/SP7	97	83	88	JMcD CHM 2006c
	RH/AC2	32	695	942	S. Garling 2000
	RH/SP9	162	10,376	12,300	JMcD CHM 1999, 2005a
Caddies Creek	RH/CD5	153	10,777	12,080	JMcD CHM 2007
	RH/CD10	122	2,004	2,549	
	RH/CD7	270	5,482	7,415	
	Mungerie Park	211	5,504	n/a	AMBS 2000
	RH/CD12	248	15,409	19,252	JMcD CHM 2002a, 2005a
	RH/CC2	111	6,705	8,554	JMcD CHM 1999a, 2005a

Location	Site	Total area m <sup>2</sup>	Total artefacts	Total lithics	Reference
	RH/CC2 mech.	100	1,073	1,167	JMcD CHM 2001, 2005a
	KV1	50	125	141	JMcD CHM 2001, 2005a
	RH/OC1	13	635	678	
	RH/SCT1	21	87	224	
	RH/SC5	54	821	1,099	JMcD CHM 2002b
Total for RHDA	21 sites	2,993.5	87,346	98,920	
Parramatta sand body	CG1	214.5	n/a	6,376	JMcD CHM 2005b
	RTA-G1	132	4,181	4,789	JMcD CHM 2005e
	CG3	123.5	487	1,198	JMcD CHM 2006b
Parramatta	Smith St	77	171	198	JMcD CHM 2004b
Fairfield	OSC1	12	358	358	Mebberson 2002
Colebee release area, Schofields	SA20	148	8,872	n/a	JMcD CHM 2006d
	SA21	112	6,646	n/a	
	SA22	106	2,944	n/a	
	SA23	86	48,873	n/a	
	SA24	114	1,695	n/a	
	SA25	69	9,493	n/a	
	SA26	52	1,835	n/a	
Greystanes	CSIRO2	25	73	131	JMcD CHM 1997a
	PH2+3	192	4,765	4,996	JMcD CHM 2004c
Eastern Ck	Power St bridge	4.5	246	272	Brayshaw McDonald 1993
Eastern Ck	Aus 1 Reedy Ck	121	1,502	2,019	JMcD CHM 2004d
	Aus 4/M7 Hub	125	118	140	JMcD CHM 2005e
	EC3	394	1,419	1,550	JMcD CHM 2006e
South Ck	LEC6-10	27	153	153	Steele 2001
Londonderry	LY2	24	398	1,067	JMcD CHM 1999b
Richmond	RM1	114	2,504	12,226	JMcD CHM 1997b
ADI St Marys	SA1	10	447	1,246	JMcD CHM 1997c
	SA2	17	458	1,163	
	SA3	14	88	188	
	SA4	37	284	539	
	SA5	33	139	325	
	ADI 47+48	193	3,981	4,956	JMcD CHM 2003b
	EP1	85	6,167	n/a	JMcD CHM 2006f
Rossmore	McCann Rd 1	25	11	11	White 2003
West Hoxton	WH3 areas	18.5	3,292	3,344	Rich and McDonald 1995
Regentville	RS1	290	n/a	18,854	Koettig and Hughes 1995; McDonald et al. 1996; Craib et al. 1999
Wattle Grove	WGO3 – 2	54.25	n/a	1,708	JMcD CHM 1998
Total	32	3,061.75	>115,000	>197,842	

\*RHDA = Rouse Hill Development Area

These open site excavations have identified an increasing number of sites with stratified deposits, from which the earliest date for human occupation in the region has now been obtained. The Cumberland Plain is of relevance to this research because of its centrality in the region geographically and within the identified culture bloc. While no sandstone shelters or platforms, and therefore no art, occurs across this area, the Plain was inhabited at European contact by *Darug* speakers who also inhabited – and produced art – in the sandstone country to its north and south. Stylistic cohesion within the *Darug* art assemblages is investigated in Chapters 8 and 9 and thus the dynamics of populations living across this area requires comment.

Excavations of shelter and open locations across the Sydney region<sup>6</sup> have yielded 121 radiocarbon determinations (Figure 4.1). There are thousands of known occupation sites and the available radiocarbon ages are thus only indicative of the rates of occupation for each millennium.

These dates reveal a slightly different pattern to that described for UMCC - where habitation establishment rates and numbers of habitations used per millennium increased slowly until the 2<sup>nd</sup> millennium, and local artefact accumulation rates suggest that this increase commenced in the 3<sup>rd</sup> millennium (see Attenbrow 2004: Table 10.4; Figure 9.1). The regional dates reveal a much earlier start for occupation - earlier in the late Pleistocene - with occupation becoming archaeologically visible at the beginning of the Holocene. An early spike in artefact accumulation rates in UMCC in the 9<sup>th</sup> and 10<sup>th</sup> millennia is replicated with regionally dated assemblages – in the 9<sup>th</sup> and 8<sup>th</sup> millennia.

There is a steady increase in sites being used from around 6,000 years ago and almost 80% of the region's determinations date to the last 5,000 years. The number of dated sites peaks in the 2<sup>nd</sup> millennium - and 28% of the regional dates fall between 1,000-2,000ka BP. There is no indication that the Cumberland Plain was occupied any later than the surrounding Hawkesbury sandstone country. The idea that the Plain was a distinct cultural unit (*contra* Kohen 1987) has no credence or utility, and the movement of people north and south of the Plain would be expected. This open Plain landscape provides complementary material to the Mangrove Creek evidence which focuses on settlement behaviour in sheltered locations. Excavation of more open sites in sandstone country is needed to test whether there was a shift in settlement behaviour towards occupation of open locations here, particularly in the last millennium. Most of the older open sites (inferred on the basis of their lithic assemblages) in the region have still not been dated (JMCD CHM 2005a, 2007) and it is likely that the 121 determinations under-estimate the number of assemblages greater than 5,000 years old. And rising sea levels have no doubt drowned a substantial proportion of the earliest occupation evidence in the region. It is also possible that many of the most recent sites in the region are also omitted from this graph. Most dating exercises focus on establishing the earliest occupation phase, and few lodge dates from the uppermost (potentially more disturbed) layers. Many Cumberland Plain open sites have not been dated because of the absence of reliably associated charcoal features.

The archaeological sequence in Sydney matches patterning found elsewhere. Human arrival on the Australian continent is now generally accepted as c.43-45ka (O'Connell and Allen 2004), with semi-arid south-western New South Wales yielding the oldest human remains known from the continent (Bowler *et al.* 2003). It has been argued that the Cranebrook Terrace, on the Hawkesbury River, has evidence of occupation dating to >40,000 years (Nanson *et al.* 1987), although the authenticity of these artefacts and the security of their context has since been queried by many researchers. Until fairly recently, archaeological shelters in the Blue Mountains [at Shaw's Creek KII: 14,700 yrs BP (Nanson *et al.* 1987)] on the south coast [at Burrill Lake: 20,000 yrs BP (Lampert 1971a)] provided the earliest securely dated evidence for occupation in the region. Open sites on the Cumberland Plain and on the coastal strip now provide good evidence for Pleistocene and early Holocene occupation in Sydney.

A Pleistocene sand body on the Parramatta River, excavated in three different development contexts as sites CG1, RTA-G1 and GG3 (JMCD CHM 2005b, 2005e and 2006a) has returned the oldest date for the region (30,735 ± 407 BP Wk-17435). This extensive sand body was first occupied during the Late Pleistocene at which time an assemblage dominated by silicified tuff artefacts was found. The upper limit for the silicified tuff assemblage is bracketed by age determinations of c.6,000-8,000 BP. Ground stone hatchet heads here are dated to c.3ka, consistent with most age estimations for the earliest appearance of this artefact type in the region<sup>7</sup>. Heat treatment

<sup>6</sup>Some sites have multiple determinations, so the number of sites included in this list is less than 121. Dates as reported in Attenbrow 2002, 2004; Balme *et al.* 2001; JMCD CHM 2005d, e, f and 2006c; Mary Dallas Consulting Archaeologists 2002; McDonald 1994; Rich 1993.

<sup>7</sup>An earlier date from Discovery Point (see below) may need to be corrected for the marine reservoir effect (Gillespie 1991, Head 1991) while the earlier date from Jamison's Creek was based on the association of a hatchet with a dated

of silcrete, and backed artefact production occurs in the uppermost units of the sand body - the top 2-3,000 years of which had been truncated by modern buildings. The Parramatta sand sheet provides significant new information about timing and patterns of Aboriginal occupation in region. The three salvage programmes completed here (Table 4.1) provide evidence for distinct and clear changes in the archaeological record through time.

Three other early sites are in open Pleistocene dune contexts in coastal Sydney [at Kurnell, Prince of Wales and at Discovery Point (formerly Tempe House): respectively, Smith *et al.* 1990, Godden Mackay and Austral Archaeology 1997 and JMcD CHM 2005c]. The geomorphic contexts of these are significant both in terms of regional models of occupation and because they have provided a deep matrix which has survived 200 years of European impact.

The site at Discovery Point, as with other stratified open sites across the region, had silcrete in its more recent and intensive occupation phase(s). A calibrated date of 10,700BP relates to the earlier silicified tuff assemblage, which is characterised by relatively sparse deposition rates, non-blade technology and stone rationing behaviour (JMcD CHM 2005c). The most intensive period of artefact production on this sand sheet is characterised by concentrated backed artefact production: the frequency of backed artefacts in the Discovery Point assemblage (6.7%) is higher than in any other reported assemblage in the region (JMcD CHM 2005c: Table 23). Subsequent excavations (JMcD CHM 2006c) were dated using shell samples, which provide an age range between 3,500 - 5,000 BP. The midden deposits were associated with heat-treated silcrete-dominated lithic assemblages. The spatial and vertical configuration of dated shellfish remains and artefact-only assemblages strongly suggests that the extensive distribution of cultural deposits across the sand sheet was created through multiple, structured, short-term occupations: e.g. tool making does not occur in prime food consumption locations. The presence of this technology in association with estuarine shellfish gathering has not been documented previously – and certainly more recent (i.e. in the last millennium) midden assemblages reveal a paucity of associated stone artefacts (e.g. McDonald 1992a, 1992b).

The high frequencies and bulk on-site production of backed artefacts place the Discovery Point assemblages in the Middle Bondaian phase, thought to occur between 1,000-4,000 BP for the greater Sydney region (JMcD CHM 2005a:13; although see Attenbrow 2004). One of the age determinations (3,860–4,218 Cal BP) is at the early end of this previously accepted chronology; the other age determination (4,547–4,940 Cal BP) is earlier, even allowing for possible marine reservoir effect (Gillespie 1991, Head 1991). This site suggests that the Middle Bondaian phase could be pushed back to c.5,000 BP or that ‘bulk backed artefact production’ in the Sydney area should be re-defined.

Falling within this age bracket are Sydney’s oldest dated human remains with its associated backed artefacts – which provide the first archaeological evidence for death by ritual killing in Australia (JMcD CHM 2005f; McDonald *et al.* 2007). Seventeen stone pieces were recovered with these excavated human remains. Two artefacts were embedded in the spine of the skeleton, and another two were found within or adjacent to vertebrae. Three small tips were conjoined to larger pieces making a total of 14 backed artefacts. Usewear on three conjoin sets indicates breakage resulting from hard impact. A fragment of hip bone submitted for dating<sup>8</sup> returned an age determination of 3,480 ± 30 radiocarbon years (CAMS-120202). The calibrated range is 3,630-3,721 cal BP (92% probability).

Punishment by spearing in a ritual fashion is documented in many parts of Australia (e.g. Backhouse 1843, Roth 1909), and is referred to in Sydney’s ethnohistoric literature in the spearing of Governor Phillip’s Gamekeeper, MacIntyre (e.g. Tench 1793). The Narrabeen man documents the use of backed artefacts as barbs in death spears. It suggests that some social practices in Sydney during the ethnohistoric present can be traced back for almost four millennia.

Hiscock and Attenbrow have argued (2005:142; and see Attenbrow 2004; Hiscock 2002) that the dramatic increase in artefact accumulation rates between 3,000 and 1,000 years ago, was hearth (Kohen 1986).

<sup>8</sup>This bone fragment was submitted for dating after consultation and full informed consent from the Metropolitan Local Aboriginal Land Council.

a response to climatic change. The onset of ENSO dominated climate initiated a trend to drier and more variable rainfall. Hiscock and Attenbrow hypothesize that those conditions stimulated change in foraging practice, perhaps with a shift to higher mobility.

The spearing of the Narrabeen man c.3,700 years ago could indicate that alterations to social organisation and group interaction may have commenced earlier than 3,000 cal BP. The Narrabeen man was slain at a time of high sea stand (Haworth *et al.*, 2002) and may well signal inter-tribal conflict due to increased territoriality and social pressure in this context. The bulk backed artefact production at Discovery Point between 3,500-5,000 cal BP supports this earlier timing.

And the archaeological signature for coastal backed artefacts – at both Narrabeen and Discovery Point – is very similar to that found across the silcrete-dominated Cumberland Plain. Technological similarities, particularly those demonstrated between 3,500-5,000 BP at Parramatta and Discovery Point indicate regional connections – or population movement – in the Middle Bondaian may well have been more fluid than during the last millennium (as observed at contact).

The first three stages of the Rouse Hill Infrastructure Project (McDonald *et al.* 1994; JMcD CHM 2005a, 2005d: see Table 1) have challenged many preconceptions about Cumberland Plain archaeology. A number of lithic reduction strategies have now been defined, most of which are geared towards microblade production. Stream order and distance to lithic sources have found to be important indicators of site size and complexity. By testing sites in an array of landscapes we can now predict how lithic densities might vary in association with increased stream order (i.e. water permanence) and with distance from streams (JMcD CHM 2007). We have also begun to identify how this pattern of site usage has changed over time – Pre-Bondaian assemblages on Shale appear to be located closer to major creeks at the sandstone – shale interface (preserved in deeper deposits) while Bondaian assemblages are distributed more widely across the landscape.

The processing of plant and animal material has been documented, including the processing of plant material using backed blades (McDonald *et al.* 1994:283-5; and see Robertson 2005). Quartz artefacts are found on many sites (in small percentages) demonstrating the movement of raw materials from Hawkesbury Sandstone country onto the Plain.

The open site archaeology of the Cumberland Plain has produced extensive evidence for technological production and living sites in the open – and we are continuing to increase our understanding of these assemblages and how they have varied through time. The extensive and unprecedented scale of investigation continues to alter the way we interpret the Aboriginal prehistory of the Sydney Basin. Just as the UMCC work (Attenbrow 2004) demonstrated that regional prehistories should not be written based on a single or few shelters – similarly the Cumberland Plain work indicates that regional prehistories must embrace open site archaeology to explain changing settlement patterns.

Our understanding of the mosaic of habitation indices across the region has evolved since Fred McCarthy (1948, 1964) first characterised the Eastern Regional Sequence (ERS). The currently used terminology in the Sydney region for phases within the ERS are Pre Bondaian (previously Capertian), followed by Early, Middle and Late Bondaian (Hiscock and Attenbrow 2005; JMcD CHM 2005a, b, e). Recent dates allow us to refine the timing of these (Table 4.2).

The change to the Small Tool Tradition is a continent-wide phenomenon of the mid-Holocene and is generally assumed to have been associated with widely ramified social changes (although see Hiscock and Attenbrow 2005: 143). Phases within the Bondaian are based on the introduction and subsequent decline of backed implements, and the increasing predominance of the bipolar technique and the use of quartz. A change in the proportions of raw materials throughout these phases is considered a factor, arguably related to changes in access to and acquisition of supplies (cf. McNiven 1999). The introduction of ground implements around 4,000 BP and shell fishhooks in the last 1,000 years were major technological innovations.

The social import of changes in stone artefacts throughout the Bondaian has been extensively debated (e.g. Attenbrow 2004; Beaton 1985; Hiscock 1986, 1993; Hiscock and Attenbrow 2003,



**Table 4.2: The Eastern Regional Sequence (dates after JMcD CHM 2005e)**

Period	Approximate age estimate	Description
Pre-Bondaian	30,000-c.8,000 BP	Preference for silicified tuff. At great distances from sources this material was augmented with quartz and unheated silcrete (coarse-grained raw materials). Cores and tools vary widely in size. No backed artefacts, elouera or ground stone. Unifacial flaking was the predominant technique, bipolar flaking was rare. A date of 30,000 BP indicates the earliest identified time frame for this Phase.
Early Bondaian	8,000 - 4,000 BP	There is a decline in silicified tuff as preferred stone and more use of local raw materials, especially at sites occupied for first time. Backed artefacts were uncommon until the later stages of this phase, bipolar flaking occurs widely although relatively rarely at individual sites. Unifacial and bifacial flaking were the dominant technique.
Middle Bondaian	4,000 - 1,000 BP	Stone raw materials vary between and within sites over time. Main phase of backed artefact production. Asymmetric flaking with platform faceting was adopted. Smaller cores and tools, bipolar flaking increases, ground stone artefacts appear infrequently (at less than half of the dated sites). Elouera are rare.
Late Bondaian	1,000 BP to European Contact	Stone raw materials continue to diversify. Backed artefacts possibly decline becoming rare or absent particularly in coastal sites. Bipolar flaking became a little more common. Ground stone is found in low frequencies at the small number of dated sites – but was identified as the major tool type at contact. Elouera a little more frequent.

2005; Johnson 1979; Lourandos 1985; Ross 1985; M.A. Smith 1982; Williams 1985). A dual social system is generally thought to have become dominant along the south-eastern seaboard with the introduction of fishhooks in the last millennium (Walters 1988). The role of women within the economic productions of this may have been radically different from that in place beforehand, where it is assumed that male hegemony was stronger (Hamilton 1980, Walters 1988). The significance of such social change is discussed below.

### **A behavioural model for the Sydney region**

Two previous behavioral models for Aboriginal land use in the Sydney region were those of Ross (1976, 1988) and Kohen (1986, 1988; Kohen and Lampert 1988). Both models favoured a coastal: hinterland social division with coastal and inland groups operating independently within culturally prescribed areas. Seasonal movement inland by coastal tribes was not envisaged as the cultural boundaries were seen as a barrier to such movement. Ceremonial activities were seen by Ross as the critical element in social interaction between the linguistic groups in the area. The main differences between these two models were the nature of regional contacts and interaction, and the location of the designated linguistic boundaries.

These earlier behavioural models are not completely overturned by the vast amount of excavated evidence collected since their inception (Table 4.1), although it is now possible to describe these in terms of residential mobility, stone tool logistics and rock art correlates. The model<sup>9</sup> used in this work proposes the following:

During the late Pleistocene/early Holocene, people had high residential mobility and travelled considerable distances between base camps. They camped near the resources they were exploiting. Residential mobility was high but logistical mobility was not: people did not engage in extensive preparation for specialised foraging. Groups moved within large territorial areas, and

<sup>9</sup>I would like to acknowledge Beth White for her contribution in developing this model over the last 10 years - and for analysing the many hundreds of thousands of artefacts we have salvaged in the numerous JMcD CHM open site projects.

the preferred raw material was silicified tuff. We know that this is now sourced primarily from the Nepean River gravels: prior to sea level rise it is possible that the Hawkesbury River would have been a source for this material along its entire length. At greater distances from the Nepean River, local stone was also relied upon. Transported silicified tuff was carried as large cores and tools to make and maintain wooden implements and to butcher animals. While cores and tools were quite large, stone was used sparingly, and few artefacts were discarded. Cores were continually transported as portable raw material supplies. Backed artefacts were rarely made.

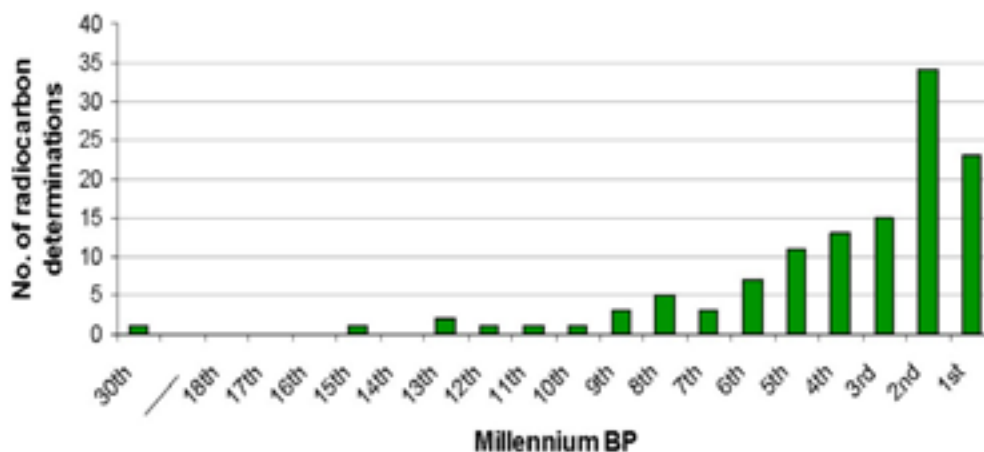
Sea levels rose and stabilised after 6,500 BP. Groups that previously occupied the now drowned coastal strip were forced inland. Bays and estuaries formed within areas that were previously low lying valleys and flats. The region's population continued to increase. After 5,000 BP technological strategies underwent substantial change, particularly evident in the emphasis placed on the use of locally available stone. By 4,000 years ago people appear to have occupied smaller territories and on a more permanent basis. Some groups lived full-time on the Cumberland Plain, some full-time in the surrounding sandstone country. Groups moved between these two biogeographic zones. Residential mobility decreased, but logistical pre-equipping (*sensu* Veth 1993) increased. While it is difficult to know what the foraging and logistical ranges of the Cumberland Plain people were – we assume that they used residential bases and defined foraging ranges on annual and extended cycles (after Binford 1982). We have been able to identify a number of sites which qualify as base camps (e.g. RH/CD12, RH/SP12 South, RH/CC2, SA23) while others contain single isolated or several short term knapping events (e.g. RH/SP13J, EC3, Aus1, WH3).

Throughout the last 4-5,000 years on the Cumberland Plain people mainly used locally available silcrete. It varied in quality but was used for a wide variety of tasks, with time and effort spent on heat-treating. The development of heat treatment technology may have occurred before this shift in resource focus. The RTA-G1 site indicates glossy silcrete was used between c.6,700 to 5,050 cal BP (Wk-17436 and Wk-17432). Glossy silcrete artefacts also dominate assemblages at Second Ponds Creek [dated between 3,640 - 3,440 cal BP and 470-290 cal BP (Wk-16227, Wk-16226: JMcD CHM 2005d:73; 135)].

Most artefacts, including cores and tools, were small. People prepared stone at local sources and transported smaller pieces of selected materials back to their residential sites. They often undertook further processing of this raw material to improve its flakeability. On some sites (e.g. RH/CD5, RH/CD12, RH/SP9) backed artefact production was practiced at an industrial scale. These tools have been described as standardized, multifunctional, reliable, maintainable and portable with the production geared to raw material conservatism: characteristics related to risk minimization in peoples' initial survival in arid zone sites (Hiscock 1994: 287, 287). Our studies in the fertile coastal Sydney region have shown that there is considerable variability in the morphology of these implements both within sites and across the Cumberland Plain and that they are not standardized. Further, the quantities of stone and numbers of artefacts left behind at production locations belie the idea of stone conservation. An arid/fertile dichotomy and the effects of this on social dynamics may well explain this finding. Conversely, the massive samples that the current open site salvages have generated may well be describing the full range of variation possible with this tool type. Microscopic usewear and residue studies indicate that these were probably multi-purpose tools (McDonald *et al.* 1994, Robertson 2005). As well as being hafted in spears (McDonald *et al.* 2007), they appear to have been hand-held and used to process plant materials and small game (e.g. birds). More intensive rounded usewear and scarring on the chords of some examples also suggests the processing of a range of soft and harder materials.

Technological change continued to take place in the most recent phase of the sequence. Bipolar flaking increased, probably reflecting even more intensive use of local resources (Hiscock 1994). Ground stone implements were ubiquitous at contact, possibly replacing larger flaked stone tools which had been dropped from the tool kit. Backed artefacts may have declined in frequency during the last millennium (Hiscock 2002, Attenbrow 2004), although there is only good evidence that backed artefact production declined on the coastal strip – where fish hooks

and organic (wood, shell and bone) tools do seem to have dominated in this time period. While fewer sites have been dated in this time frame (Figure 4.1), there are various examples of backed artefact production in the last millennium and indeed within the last 500 years [e.g. Loggers shelter 780±80 BP (SUA-1124): Attenbrow 2004; RH/SP12 South at 337±37 BP (Wk-16226): JMcD CHM 2005d; Ropesend Creek rockshelter 230±50 BP (Beta-65747): Rich 1993].



**Figure 4.1: Radiocarbon determinations from the Sydney region, millennial sequence.**

It is not known whether the gender divide observed on the coast (exemplified by use of fishhooks by women and fishing spears by men) was replicated on the Cumberland Plain. The starch evidence that plant material was processed using backed artefacts (McDonald *et al.* 1994) may hint that women used these tools to process their collected contribution to the diet. It certainly seems unlikely that the dual social system in place in the last millennium was restricted to the coastal strip. Woman's roles in the social system at this time are likely to be demonstrated by gender-sensitive aspects of the archaeological record (e.g. in art and material culture).

#### *Summary of the model with likely art correlates*

The Sydney Basin has been occupied since c.30,000 years ago. The earliest stone assemblages, as with Pleistocene evidence from elsewhere across the continent (O'Connor *et al.* 1998; Smith 1987, Thorley 1998, Veth 2005) represent sparse – but real – populations. The technology being used at this time was flexible and settlement appears to be focussed on riverine resources – now preserved in deep sand bodies. The settlement pattern appears to have been one of high residential and low logistical mobility.

Social networks during the Pleistocene were probably more open and far reaching than recorded at contact. Rock art used in this social context would have demonstrated widespread group cohesion (McDonald 2005). The visually homogenous, multivalent engraved (petroglyph) art graphic which is present across vast tracts of Australia – particularly in the arid zone – exemplifies the type of art used at this time. There is some evidence for this type of art functioning as a graphic system across the Sydney region.

In the late Holocene with the advent of larger and more frequent Pre-Bondaian assemblages, we begin to observe indices of social complexity – emerging territoriality and changing levels of mobility. Regionalised style provinces are likely to have evolved with this increasing social complexity, although it seems likely that it was only in areas where high populations and intense social exchanges occurred – combined with stable art matrices (e.g. the Pilbara, Arnhem Land and possibly the Western Desert) that extensive art bodies are likely to survive from this phase. Much of this early evidence in Sydney may have existed on the (now) drowned coastal plain.



The Sydney region's Bondaian assemblages demonstrate a range of archaeological indices with behavioural and resource structure correlates (Ambrose and Lorenz 1990). Residential mobility decreases, there is increased territoriality, group sizes increase and spatial organisation becomes more structured. There is an increase in the use of localised as well as exotic raw material and assemblage diversity burgeons.

Rock art, and symbolic behaviour generally, is seen as an important facilitator and component of increasing and continuing social complexity across the region throughout the late Holocene. The larger culture group (Peterson 1974) would be likely to distinguish itself from other culture groups: local group identity within the culture group would be increasingly demonstrated. Local group identity may be correlated with language boundaries. The dual social system of the last millennium may be identifiable in aspects of the rock art as with items of material culture.

This model forms the basis for the following rock art analyses.