Water Dreams, Earthen Histories: Exploring Urban Environmental History at the Penrith Lakes Scheme and Castlereagh, Sydney

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ABSTRACT

Urban environmental history comprises both human and ecological experience; the two were and are inseparable, and their interaction is dynamic. This essay explores the human and bioregional history of the Penrith Lakes Scheme at Castlereagh in outer Western Sydney as a case study in integrating the two approaches. Conceived in the late 1960s, the Scheme is a quintessential 'hybrid landscape', aiming to rehabilitate 2,000 hectares of open-cut gravel quarries by creating huge artificial lakes and landforms. But it destroyed a rich palimpsest of earlier farming and Aboriginal landscapes, both of which had also transformed the environment. By focusing on this place over time, it is possible to track the succession of Aboriginal, settler, industrial and urban histories, to explore the shifting meanings of this environment, the different ways they knew and shaped this country, and the politics and strategic uses of different types of environmental knowledge.

KEYWORDS

Urban environmental history, hybrid landscapes/ landscape history, gravel/sand mining, landscape and memory

INTRODUCTION

Australians look to their rural and outback landscapes for national identity, uniqueness and mystique, but most of them live on the greener, lusher coastlines of the continent's south-east crescent. They strive to get as close to the booming Pacific as possible. On the outskirts of their cities are the dynamic, ever-shift-

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ing hinterlands, places of loss and transformation which blur the boundaries between urban and rural. This essay explores one such place. It is a story about water dreams on the world's driest continent; it is also an urban story about earth and stone and the uncompromising demands of a city. The story tracks the way human visions, dreams and experiences have been entangled with ecological realities in Australian cities.

URBAN ENVIRONMENTAL HISTORY AND THE CULTURAL TURN

For some years now, environmental historians have acknowledged and argued that the nature/culture divide which posits humans outside (usually against) nature is a false and misleading dichotomy. Hence, 'wilderness' is more a powerful cultural construct than objective fact. Conversely, its nemesis, the city, can be seen to some extent as an ecosystem, part of nature. Richard White argued forcefully that most landscapes are hybrid landscapes and discussed the 'cultural turn' in more recent environmental history. He meant 'culture' in the most general sense, as any aspect of the environment created, shaped or otherwise affected by humans.[1]

This is not simply a case of the pendulum swinging too far the other way and into the hands of anti-environmentalists. William Cronon, in a new introduction to *Uncommon Ground*, insisted that such insights were not anti-environmentalist but 'quite the opposite', for they promoted 'greater understanding and self-knowledge, qualities which … should only strengthen and deepen the insights [environmentalism] has to offer'. Donald Worster argued that if historical perspectives on environments reveal change, disturbance and dynamism rather than stability and equilibrium, they also reveal that 'change is various', rather than the same or equal. Historical change in one time or place does not justify every other environmental change. As for cities, over a decade ago Martin Melosi called for a more integrated approach to urban environmental histories – urban scholars need to look beyond 'growth, infrastructure and pollution' while scholars of 'humans and nature' also need to be persuaded to 'look at the cities'.[2]

Despite this pronounced 'cultural turn' in environmental history generally, *urban* environmental history still tends to be written according to the older dichotomy of pure nature versus corrupt culture, sacred wilderness in opposition to the non-sacred ordinariness of cities, technology and modernity. In Australia, where 85 per cent of the population lives in urban areas, the study of urban environments has been largely concerned with either the historical reconstruction of indigenous vegetation (the 'original' nature) or tracking, measuring and mapping the destructive impacts of urban expansion upon the natural environment. Inevitably the latter list is long: air and water pollution, erosion, the destruction of increasingly scarce bushland, waste management or mismanagement, dryland salinity and the reckless exploitation of non-renewable resources. These stud-

ies take their cue from the urgent environmental problems facing cities – their focus is biosphere and they grade into the sciences of ecology.[3] Often, the *a priori* assumption is that role of humans, and the city itself, is damaging: thus nature and the city are opposed and city dwellers are environmental vandals. The outlook is dire.

Those relatively few Australian studies which explore human environmental experience in cities provide important insights into belonging, experience and sense of place. These are emotional, intimate and/or celebratory histories, but they generally do not engage with vital urban problems or urban ecology.[4] Very recently, however, some historians and ecologists have broken away from the approach focused on destruction and pollution and demonstrated the value of new, more integrated ways of thinking about nature in the cities. Examples include Andrea Gaynor's study of suburban food growing, and the work of Heather Goodall and her co-researchers on the human and environmental history of the Georges River in south Sydney.[5] At the same time, ecologist Tim Low's provocative book *The New Nature* questions the very notion of what is 'natural', and tracks new urban ecologies in which all manner of plants, birds and animals make new homes in our cities, often in surprising places.[6]

Meanwhile in the United States, Mike Davies' *City of Quartz* presented an apocalyptic vision of interlinked social and ecological disaster in Los Angeles, and William Cronon's sprawling *Nature's Metropolis* demonstrates that city and hinterland cannot be understood separately: they form a system. Adam Rome's *The Bulldozer in the Countryside* locates the origins of postwar environmentalism in the rapidly expanding suburbs rather than with government bodies, recreational groups or wilderness campaigners. These works similarly demonstrate 'how environmental and social history both benefit from a tighter association'.[7] Other key interests are the development of planning ideas and practices, urban service infrastructure and the city's relationship to technology.

Nonetheless, the older approach still dominates much of the urban environmental historiography of Europe and the United States. Much of it focuses on the deleterious environmental impacts of cities, usually industrial cities; historians have taken a 'problems' approach, with good reason. Driven in part by urgent current concerns, scholars are interested in identifying and tracking 'source and sink' patterns – that is, where cities have procured their energy and materials, how they transform natural resources, where they dump wastes after consumption and the environmental and social impacts of these processes. The pathbreaking works of Andrew Hurley, Martin Melosi and Joel Tarr on air, land and water pollution and sanitary infrastructure opened a whole new vista on city growth and its true costs, and the power politics shaping environmental conditions, particularly in relation to class and race.[8] Environmental history in European scholarship is said to be characterised by its frequent focus on urban areas, as well as cultural landscapes. Here too, pollution looms large in the study of cities. They tend to be studied primarily as sites of material and energy

exchange - some argue that this approach is the way to 'bridge' the humanities and the sciences.[9]

Overall, then, urban environmental history is often underpinned by a powerful *metabolic* model: the city is conceived as a body, consuming and excreting. Its environmental impacts can be measured as an 'ecological footprint', hundreds of kilometres in extent, stamped on the hinterland.[10] Such histories are invaluable for contextualising current 'crises' (in some cases by showing they are not unprecedented crises at all, but constants) as well as future strategies for sustainability, by 'showing how urban systems work', particularly as 'we know little about what makes a city sustainable'. But, as Peter Coates recently asked, where are the 'ideas of nature' – in this case, of city, suburban and peri-urban people? [11]

As several scholars have demonstrated, then, urban environmental history clearly comprises *both* human and ecological experience: these are just as entangled in towns and cities as in rural and 'wilderness' areas, they encompass much more than pollution and degradation, and their interaction is dynamic. We know a lot about the messes that cities make, but the cultural, emotional and visceral environmental experiences and behaviours of city dwellers are rarely acknowledged or explored. Instead, people tend to be seen in ant-like proportions, either victims or villains of the relentless leviathan cities. And what is meant by 'culture'? While it can be argued that consumption and pollution are 'cultural', because they usually involve humans, I believe a more specific definition of 'culture' would be useful here. As many non-urban environmental histories demonstrate, culture can be seen as the 'webs of meaning', processes by which people make sense of their worlds, strands which bind together pre-existing ideas with ongoing encounters and learning, and which shape actions and responses.[12]

While economists and ecologists routinely regard cultural beliefs, practices and behaviour as peripheral – a sort of 'icing on the cake' – in fact they are drivers.[13] Some examples: it is difficult to understand the demonisation of urban working class neighbourhoods in the nineteenth and twentieth centuries without examining the powerful social and cultural ideas which helped to create the 'slum'. How can we understand the complete turnaround in attitudes to Australian beaches in the nineteenth century (from howling wastes to nature's invigorating paradise), and their physical transformations, without grasping the rise of middle class popular culture and their passion for genteel seaboard picnicking? Air pollution from car exhausts and endlessly expanding freeways might be properly related to the powerful culture and image of the car, and how owning and driving one makes people *feel*.[14] In short, if cities are hybrid landscapes, if we are to study them as cultural as well as natural environments, then we need to use the methods, perspectives and insights of cultural history in tandem with those which deal with ecosystems and the biosphere.[15]

How would it be possible to integrate the two meaningfully? Cities are such large and complex artefacts, where built and natural environments are constantly reconfigured by the interplay of culture and nature, memory and amnesia. As well, such an approach would have to be cross-disciplinary, integrating scientific and humanities research. One way of linking deep human experience and biosphere history is to look at the interaction over time in a particular place, a key site or a bioregion. 'We ought to aim' wrote Dan Flores 'for the "big view" not so much through wide geographic generalisations in shallow time, but through analysing deep time in a single space'.[16]

This essay examines the Penrith Lakes Scheme and Castlereagh in Western Sydney, NSW, Australia, in this way. Located in the hinterland, this place demonstrates the processes by which cities are made, and the ways they transform landscapes. By recovering the histories of people *and* country here over time, by integrating ecology and history, it is possible to track the succession of Aboriginal, settler, industrial and suburban impacts upon this place, to see how city and hinterland were linked, how one is now being subsumed by the other, and the means, costs and transformations of urban expansion.

Ironically this is also a history of amnesia. At each of the three points of radical transformation, existing landscapes, histories, traditions and communities were forgotten or ignored. Forgotten or invisible landscapes are rarely acknowledged or valued.[17] Castlereagh, like many Australian places, was conceived by newcomers and outsiders as a *tabula rasa*, unfettered by human or ecological history, destined only for reinvention.

THE PENRITH LAKES SCHEME AND CASTLEREAGH

Sydney grew on a magnificent harbour which has its headwaters on the Cumberland Plain. Fifty kilometres to the west, the Nepean River runs at the foot of the Blue Mountains escarpment, flowing north, then east, girdling the plain. Since the 1890s, the gravels and sands laid down by the ancestral river have been being extracted to feed the ever-expanding city. Today the suburbs that make up most of Sydney have spread over the plain to engulf the older farmlands and country towns established on the rich floodplain soils.

At Castlereagh, on the banks of the Nepean, 2,000 hectares of these former farmlands are now an open cut mine. By 2010 all the gravel – around 200 million tonnes of it – will be gone and in its place will be an entirely new landscape of huge artificial recreational and wetland lakes as big as Sydney Harbour, surrounded by rolling hills. A housing development is also in the final stages of planning, comprising about 4,000 new dwellings to house around 10,000 people. Every aspect of this future physical environment here must be created, monitored and managed, from soil and subsoil structure to water catchments, runoff patterns and purifying strategies, from flora and fauna to homes for

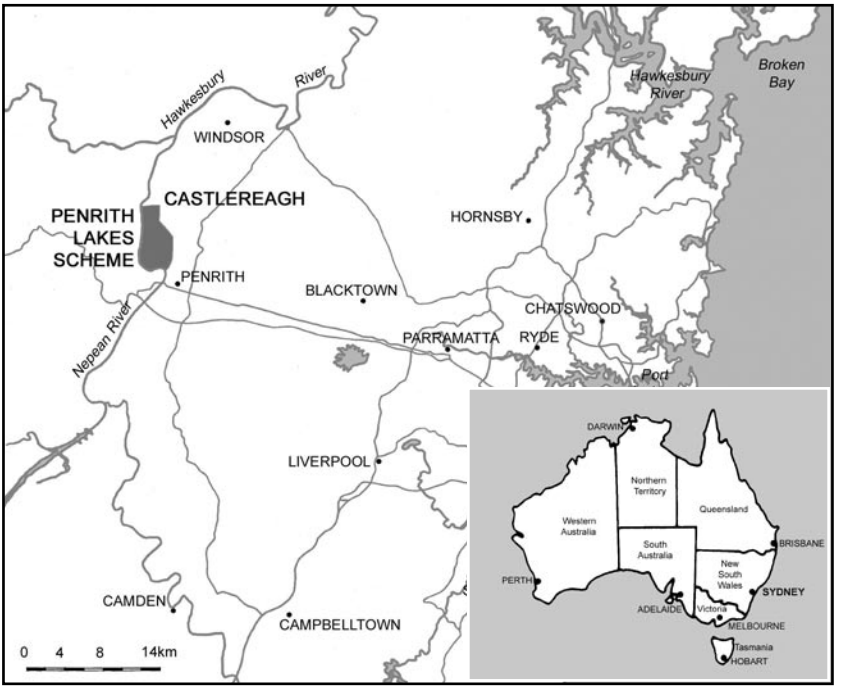

FIGURE 1. Location of the Penrith Lakes Scheme and Castlereagh (Angela Lober)

those whom ecologists like to call the 'keystone species' of this future suburban habitat: humans.[18]

The present *tabula rasa* appearance of this place – a vast orange quarry, seven metres deep, as far as you can see – elides its history. The Scheme destroyed a rich palimpsest of earlier farming and Aboriginal landscapes, both of which had also transformed the environment here. These included an early colonial settler landscape on the Nepean River floodplain, set beneath the brow of the Blue Mountains. Scattered over the landscape, or lying below the surface, was the much older, deeper archaeological record of the Mulgowie and Boorooberongal Aboriginal people. There were also black clay freshwater wetlands, and remnants of the riverflat forest and Castlereagh woodland. And there is an ongoing history of human belonging and dispossession here. At both points of major disruption and removal, people fought for their country; they still mourn for it.

The Scheme is a quintessential 'hybrid landscape' where the interaction of humans upon nature has been cataclysmic, but where nature nevertheless often sets the agenda, often in wild and unpredicted ways. At Castlereagh, as in most other places in Australia, human and ecological histories are inseparable. But if

hybrid landscapes usually hold 'the hope of return', the possibility of restoration, here that hope has been extinguished.[19] The river, despite its problems, still runs its course, the ancient shoulders of the Blue Mountains will always loom above, but Castlereagh cannot be recovered: it must be remade.

RIVER, FARMS, FENCES: THE SETTLERS

Before the quarry destroyed it, Castlereagh was most obviously a landscape of small farming. Some fence-lines, running east to west, still marked out the farms of the earliest European settlers allotted land here in 1803.[20] The ways they farmed and their building styles reflected practices and traditions that were much older.

The fertility of the river-flat soils had been discovered in 1789 and from January 1794 settlers had already cleared and planted farms at the Green Hills (later Windsor), further downriver.[21] But the richness of the soil, the slackness of acting governors and the distance from Sydney had ironically resulted in a perversion of the agrarian dream. Instead of social order, neat, smiling rural landscapes and a sturdy yeomanry, Green Hills was a site of disorder, defiance and debauchery. Judge Advocate David Collins observed, scandalised, whereas other settlers were 'putting their wheat into the ground', the Hawkesbury settlers

> … had scarcely made any preparations, consuming their time and substance in drinking and rioting; and trusting to the extreme fertility of the soil, which they declared would produce an ample crop at any time without much labour.[22]

In the growing, raffish town of Sydney the soil was too poor to support the ideal agrarian community; here, perversely, the colonial earth was too rich.

So when Governor King decided to grant land at Castlereagh further south in 1803, he had learned the lessons of the Green Hills. Castlereagh was set out in an orderly fashion, surveyed before occupation, the paper lines laid over the tangled brush of the river flats. The long, narrow blocks each had a river frontage and backed onto a track running north to Richmond. The acreages were carefully calibrated to family size and status. And where the Green Hills settlers had been largely ex-convicts who settled themselves, here settlers were carefully selected and arranged upon the land. Veteran soldiers were alternated with emancipists and a few free settlers. King's Castlereagh was an exercise in social engineering; the land was the raw material and the canvas which they would transform.

They encountered a landscape of dense, viney river-flat forest ('brush' in settler terminology) which grew on the rich alluviums, dominated by river oak (*Casuarina cunninghamia*), broad-leafed apple (*Angophora subvelutina*), forest red gum (*Eucalyptus tereticornis*) and cabbage gum (*E. amplifolia*). Further to the northeast, a quite different forest, Castlereagh Woodland, grew on the sands,

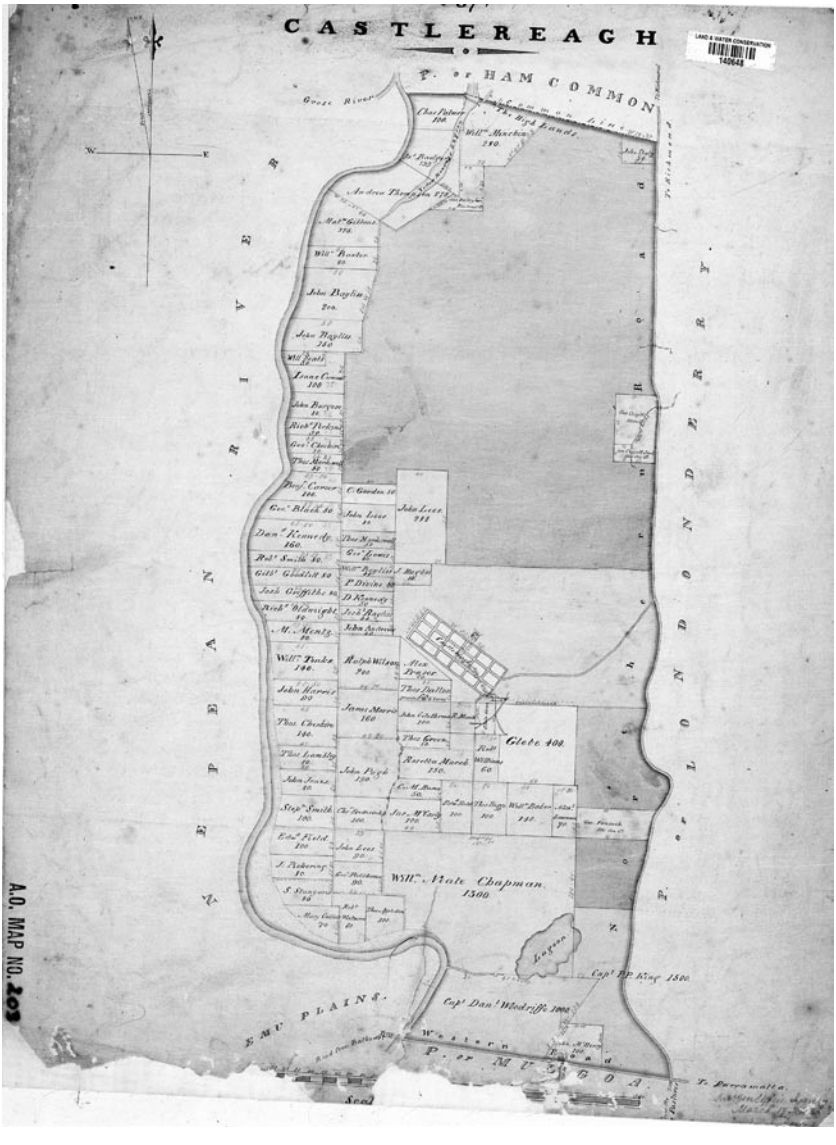

FIGURE 2. Map showing original Castlereagh farms granted in 1803 along the Nepean River. Further east (centre), Macquarie's failed township is marked out on higher ground. (Castlereagh Parish Map 1835, Courtesy NSW Lands Department)

clays and gravely soils. Here ironbarks (*E. fibrosa* and *E. cerebra*) and Mugga (*E. sideroxylon*) dominate on the clays, while scribbly gums (*E. sclerophylla*) and narrow-leafed apple (*Angophora bakeri*) thrive in sandy parts. Freshwater wetlands and lagoons, alive with water birds, were found in the swales behind the high banks of the river, and here watercourses ran roughly parallel to the river. Along the eastern portions of what later became the Scheme lands, a seam of black clay, which had filled the river's ancient path about 36,000 years ago, supported a wetland of reeds and water couch, the tall sedge *Carex appressa*, once typical on the coastal lowlands, and *Melaleuca linariifolia*, narrow-leafed paperbarks. [23]

The Castlereagh farmers quickly cleared the dense forest on the floodplain, cutting trees to about a metre from the ground, leaving the stumps and roots, later burning trunks and branches. By 1804 the loss of trees and plants along the river had been so heavy, and with such devastating results, Governor King forbade further clearing there, thereby instigating some of Australia's earliest environmental legislation. The settlers' agricultural methods were primitive: they planted mainly wheat and maize, broadcasting seed by hand, often growing two crops on the same land in a year (this last was a matter of great wonder, reported in every letter sent Home). These small settlers kept pigs and goats, which required little grazing land and reproduced quickly. They learned to use local timbers to build their small boats, travelled up and downriver, and their mills harnessed the currents of the river to grind wheat and corn. By the early 1820s they had one-acre orchards of oranges, lemons and peaches, and kitchen gardens where they grew potatoes, peas and beans, though they did not fence their land extensively and kept stock confined in pens. [24] Early fencing was installed by the larger, wealthier landowners who were graziers. Fences had political as well as practical purposes, for they marked out claims to contested ground, enclosed land by formalising property boundaries and cut off the early network of unofficial but commonly-used roads, much to the inconvenience of small settlers.[25]

Wheat-growing on the Cumberland Plain ended after the onset of rust in the 1860s, but the arrival of the railway at Penrith in 1863 and the availability of refrigeration further encouraged fruitgrowing and dairying. Farmers – both landowners and leaseholders – planted orchards, vines and olive groves, and established market gardens and small dairies to feed the growing metropolis. The advent of modern 'scientific' farming of the twentieth century brought the fertilisers, herbicides and pesticides which ended up in the earth and the waterways. By the 1960s and 1970s the area had been farmed continuously for almost 200 years.[26]

The impacts on the landscape and vegetation of the floodplain were dramatic. Only two years after the first settlers went to the river at Castlereagh, three-quarters of the small grants had been cleared of trees. Thirty years after the settlement of the valley as a whole, James Atkinson wrote that the 'greater

FIGURE. 3 Aerial view over Castlereagh to the south in 1985, showing quarrying operations, the early Penrith Lakes Scheme, the Nepean River (top right), the farmed floodplain and suburban and industrial development beyond. The fencelines on the right still mark out the first land grants of 1803 (compare with Fig. 2). This is the area (DA4) being quarried at present (courtesy Penrith City Library Studies Collection).

part of the alluvial lands upon the Hawkesbury and Nepean have been cleared and are under cultivation', with the concomitant loss of wildlife. Ever since then 'areas of unproductive vegetation appear to be kept to a minimum in order to capitalise on the productivity of the land'.[27] But while the river-flat forest mostly vanished, the Castlereagh woodlands on the higher, less fertile ground were largely shunned by settlers, and as a result a considerable extent is still there today. Timbergetters in the region stripped the forests further north of red cedar in the first ten years, then logged blue gum, blackbutts, mahoganies, ironbarks, stringybarks and bloodwoods.[28]

Farmers occasionally left trees, such as the slow-growing blue box, (*E. bauerana*) or the cabbage gum (*E. amplifolia*), in the paddocks. These grew and

FIGURE 4. Satellite image of Castlereagh c.2006 showing the impact of open-cut gravel quarrying on the earlier landscape (courtesy Google Earth)

spread into giants, havens for birds and animals. A plethora of exotic plants, useful and ornamental, took root in pastures, gardens and orchards. Some specimens surviving in old Castlereagh gardens and on properties, such as Chinese holly, carob trees, hoop pines and Chinese windmill palms, are now unusual or rare. Others, such as weeping and basket willows, oaks, castor oil plants, blackberries, peaches, figs and privet went wild. But over the decades settlers also took a fancy to indigenous trees, such as kurrajongs (*Brachychiton populneus*), white cedar (*Melia azedarach var. australiasica*) and angophoras, and planted them in their gardens, along laneways and in cemeteries. [29]

The landscape was also slowly scattered with buildings 'like specks amidst fields of grain and meadows'.[30] Houses here were mostly modest, built of slabs and sawn timber, and later salmon-coloured bricks fired from local clays, and cropped or drooping roofs of bark or shingles. Settlers brought the traditional architecture of England and Ireland with them. Some lived in mean three-sided cottages – the side with the hearth was open to the weather.[31] Those with more means and interest in comfort built farmhouses like Hadley Park, a simple,

FIGURE 5. Hadley Park, vernacular farmhouse built c1812, still largely unchanged and intact (photo: Benedict Taylor, 2005)

two-storey farm house with a steep jerkinhead roof, dating from about 1812 and still extant. Gradually a succession of other buildings appeared, dotted here and there: farmhouses, dairies, roadside pubs, schools and chapels, boiling down works, mills, slaughterhouses, barns and sheds. The people buried their dead in small plots across the plain, the graves properly facing east, ready for Christ's return at the final trump.[32]

But this could never have been a simple story of one-way pioneer progress for one major reason: floods. The Hawkesbury-Nepean valley is particularly flood-prone because of its geomorphology. It is like a gigantic basin with relatively narrow exit channel – the section from Sackville winding through steep sandstone country to the north and east. Floodwaters from the extensive mountainous catchments of the Nepean, Warragamba and Grose Rivers and South and Eastern Creeks roar down into this basin, cannot escape, and so they fill it, drowning the broad floodplain and making islands of the high points.[33]

The 1803 Castlereagh settlers knew that their farms and lives were at risk from devastating inundations. Every white visitor to the Hawkesbury before 1794 had seen the eerie, silent warning of driftwood caught high up in the trees. For five years the farmers in the region escaped major flood, but then two inundations swept through from the south in May 1799 and March 1800 and a third in 1801. Twenty metres of rising, rushing waters carried off building, grain and livestock, as well as the very soils they prized, exposed as a result of their clearing. David Mann wrote in later years 'Scarcely … had they begun to revive after this calamity – scarcely had they repaired the ravages occasioned by this tremendous inundation … before those ill-fated settlers were doomed to experience a repetition of destructive calamity'.[34]

But the settlers were not discouraged, and the settlement continued to grow – by 1810 the Hawkesbury-Nepean was the 'breadbasket of the colony'. At Castlereagh the grants hugged the river bank too and were inundated in 1806 and then twice in 1809. Floods kept many of the farmers in a wretched state, living on maize. Governor Macquarie toured Castlereagh and found 'good farms', but condemned the meanness and poverty of the housing. Farming should have been a life of neatness, ease and comfort. At Castlereagh he decreed that a new village should be established above the flood levels, and directed the settlers to move there. As an added incentive, he had a common marked out for their use. But they refused to shift, staying stubbornly on the flats near the river, replanting, some building two storied houses and barns with lofts further back from the high banks, where they could take refuge when the next flood swept through.[35]

There is something slightly mad in the way the settlers stuck to the river flats, knowing as they did the capricious powers of these waters. Their attitudes, experience and expectations of land and river clearly differed from those of governors. Contemporary reports portray the river as a powerful living entity with a will of its own, surging well beyond puny human ideas of order and control. The *mentalité* of ordinary settlers, those of the lower orders, allowed them to

grasp the floods. Their world view turned upon fate and opportunity rather than notions of control, forethought and prudence. The flooding river stood alongside life's other awesome and inescapable factors: the vast ocean which might drown them, disease, madness, accident, death; any of these might strike at any time. The best, and perhaps only responses to occurrences beyond human control were resignation and pragmatism. This meant that good fortune was also conditional on luck, fate, Acts of God. The shining river brought plenty in rich alluvium to replenish soils; and it brought devastation.[36]

At Castlereagh, unlike so many other places where small farming was tried, many of the families remained on their land, some right up until they sold out to the quarrymen in the 1960s and 1970s. They intermarried to such an extent that descendent John Byrne describes the community as a 'rope, all intertwined as people married out of one family into another … so long as they stayed around the same district'. This continuity allowed knowledge about the land and river to be passed on. Sue Rosen, historian of the Hawkesbury-Nepean River, observes that the 'nature of the various floods then and subsequently are an established part of folk wisdom of the area. They are a source of many astounding stories … unpredictable, spectacular and threatening … flooding has become a subject of study and speculation'.[37] Big floods were the temporal markers of local memory; they shaped and divided lives.

VISIONS SPLENDID AND NOSTALGIC: ARTISTS AND WRITERS

Powerful arcadian visions continued to be vectors for government policy and settlers' democratic ideals as settlement expanded far inland from the Nepean.[38] Yet at the end of the nineteenth century, the old, settled Nepean landscapes were rediscovered by artists like Arthur Streeton, Charles Condor, Julian Ashton, and many more. The artists climbed to the ridge-tops, staked their canvasses and painted splendid visions of 'peaceful settled farmlands set in the light and heat of the "slow immense Australian summer"', the silver waters winding away to the north. They painted misty mornings, dewy paddocks and warm-hued, comfortable old colonial buildings. Historian Helen Proudfoot writes that this landscape entered the Australian consciousness through these paintings. Where other paintings – those of Tom Roberts for example – still portrayed the Bush as sombre and melancholy, or rough and male, here white Australians beheld, and embraced, a new image of the Bush, and of themselves.[39]

In the first decades of the twentieth century, writers, journalists and early popular historians were also drawn to Castlereagh, the river and its farming folk. Theirs were stories of rediscovery, for here was a lost world, a bygone era of rusticity, right on the doorstep of the great throbbing city. Novelist Miles Franklin set her third novel, lumbered with the ungainly title *Some Everyday Folk and Dawn* (1909) in the region. The towns here, she wrote, were 'divided

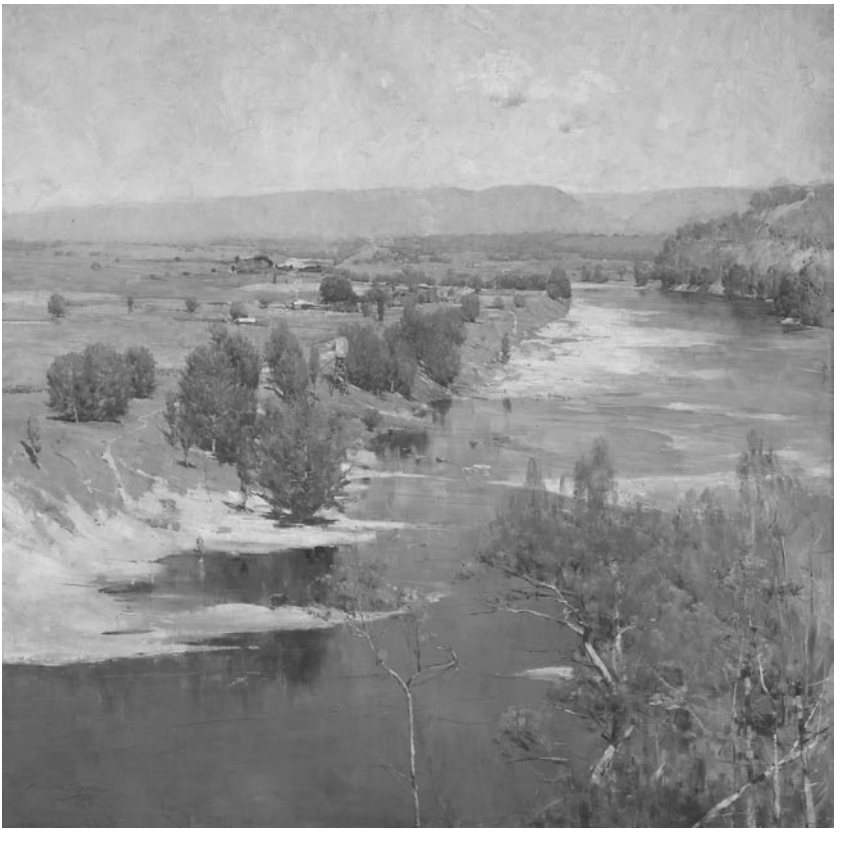

FIGURE 6. Arthur Streeton's famous picture of the Nepean River valley, 'The Purple Noon's Transparent Might' 1896 was painted from the ridge at Agnes Banks, just north of Castlereagh

by a mile and the river … they lay asleep against the ranges in a slow-going world of their own'. The valley was one of fruitfulness and plenty, a cornucopia of melons and grapes, and its 'little homesteads lay royally, peacefully free from molestation amid their wealth of trees and vines'. The farming people's ancestors had become part of the very land: for in the light of the shining moon 'here and there a gleaming white cluster of tombstones bespoke the graveyards where slept the early pioneers and the folk who followed them … and which one by one were settling their last earthly score'.[40]

Early antiquarians and historians including J.C.L. Fitzpatrick, William Freame, George C. Johnson, and the indefatigable Frank Walker wrote rambling and patchworked 'peeps into the past' for Australians newly interested in their own

history. They delighted their readers by putting on their boots and going 'On Tramp', as G.C. Johnson's 1904 series was called. He conjured an almost English scene of 'pleasant lanes, with maize growing on one hand and clustering grapes on the other', and he too was drawn to the old burial grounds. He visited them, carefully recorded the gravestone inscriptions, and mused on the lives and fates of the pioneers and the way they were remembered.[41]

People and land were also inseparable in journalist and historian William Freame's interviews with local Penrith personality Michael Long, published as 'Reminiscences of a District Veteran' in the *Nepean Times* in 1912. These sought to capture local society and culture which had passed away: illiterate, rude, preindustrial; but also rustic, unpretentious and honest. When Long died in 1926, Freame wrote a heartfelt tribute to his friend which was a lament for a lost generation, and which mingled spiritual and environmental:

> Today, as he always said, the river will continue its song … the sun its rising and setting...the dark shadows will fill the mountain gorges and creep to the river's edge … [and] the soul of Michael Long still goes on towards the hills of God.[42]

Why did writers like Miles Franklin and the historians write such deeply felt prose about this particular landscape? Why were the paintings of Streeton and Condor so popular? From the 1860s, Selection and small-farming in Australia had in so many places proved a disaster, with terrible environmental and human costs. Mechanisation had already transformed the shearing sheds into factories and the scientific management of soil, plants, animals and water were held up as the modern weapons in the battle to conquer the environment.[43] As well, the booming, modern, fast-paced cities were clearly the places where most Australians lived, a deeply worrying fact. Who were the 'real' Australians? Did whites really belong here? In Castlereagh, in the old river valley settlements, there seemed to be proof that here at least, small farming had been successful. Simple hard work and simple ways of life had flourished free of city pretensions and corruption. Families had put down roots into the earth, been born to it, were laid to rest in it; and they had learned to love the river.

RIVER, STONE, FOREST, FIRE: ABORIGINAL PEOPLE OF THE NEPEAN VALLEY

The sunlit languor, the dappled rural glory of the paintings and the powerful appeal to emotion and intimacy in the prose, concealed a splendid amnesia too, of course. These seemingly whole pioneer and settler vistas do not reveal that the long-ploughed and flooded fields were densely scattered and studded with stone tools and chips, nor that this country had already been intimately known. And Aboriginal people still lived here when these images and stories, this jubilant or nostalgic 'white noise', as historian Tom Griffiths calls it, were fashioned.[44]

The Europeans who came crashing through to the Nepean in 1789 saw the marks of smallpox on the faces of Aboriginal people here and they knew that the disease had swept through, as on the coast. From some they learned that entire bands west of Parramatta had been killed by the disease. Survivors had probably formed new bands, the human landscape had already changed forever.[45] So in anything we say about Aboriginal people and country here, there is this undertow of appalling loss – the loss of people, knowledge and culture.

And yet we do have artefacts, words and environmental data. The signs of Aboriginal occupation had always been there in stone, silent yet insistent. Castlereagh's earth was deeply inscribed with the occupation of Aboriginal people, despite clearing, intensive farming, other development, and artefact collecting. We also have the words of early white explorers, words and stories collected by early anthropologists, and the words of surviving Aboriginal people.

The Boorooberongal people lived on Dyarubbin, the river, around what became Windsor, but perhaps also southwards. Near Castlereagh, the people are said to have been called Mulgowie, probably after the mulgoa, the black swans which were once so abundant on Dyarubbin. Mulgowie country stretched along the river from Castlereagh to the Mulgoa area. It is possible that Castlereagh, at a deep bend in the river, was a border area between these two groups.[46]

Artefacts are found in higher densities around the river and the tributary waterways, so archaeologists suggest that these were the densest places of occupation. In the 1880s Na Daang, or Black Nellie, the so-called 'last of her tribe' in this area said that it had been a place of plentiful food and thus many Aboriginal people: 'plenty of wallaby, kangaroo, plenty to eat, plenty of blacks, not many whites'.[47] The implication is that scarcity of food came with the whites. The waterways and swamps nourished them with edible tubers, lilies and rhizomes, floating Nardoo ferns, mullet, eel, tortoises, freshwater mussels and waterfowl – swans, wood duck, chestnut teal, brown quail. Creepers and vines with yam-like roots, like wombat berry (*Eustrephesus latifolius*), native potato (*Marsdenia flavescens*) and native yam (*Dioscorea transversa*) grew in great abundance along the banks and floodplains. Edible fruits grew in or near rainforest in steep gullies on the western side of the river. Most of these were available in autumn and winter. Aboriginal people, as Val Attenbrow points out, 'organised the location of their camps and movements to take advantage of … variations in distribution, abundance and seasonality of food', and these patterns were highly regionalised.[48]

The Europeans most often noticed the importance of small animals, particularly possums, in the Aboriginal diet, and the method of possum hunting was of great interest. A fire was lit in the hollowed out base of a tree to smoke the animal out, and the hunter nimbly climbed up using notches cut in the trunk so he could club the possum as it emerged. The Boorooberongal were renowned for their climbing and could scale heights of over 20 metres. Climbing and hunting seems to have been a skill which distinguished the people of the inland, as the

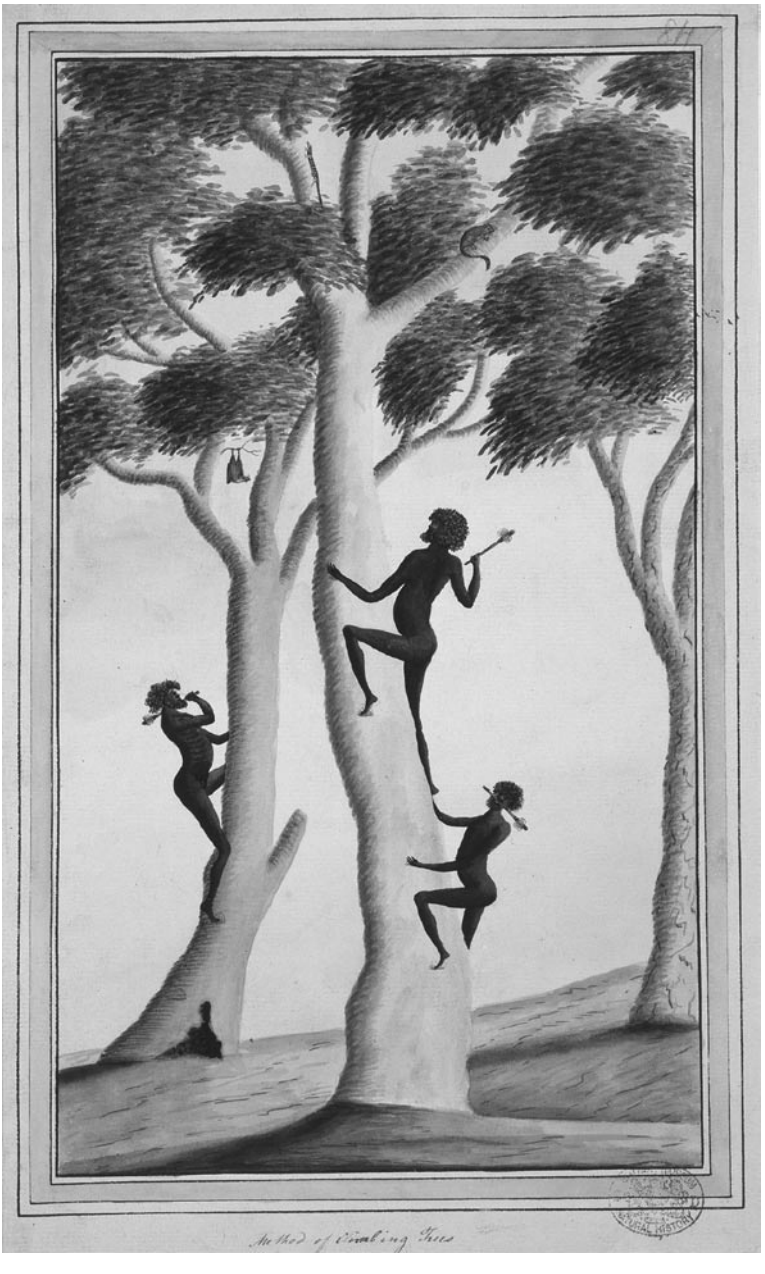

FIGURE 7. Port Jackson Painter, 'Method of Climbing Trees' (courtesy British Museum of Natural History, Watling Collection 75)

coastal Aboriginal people referred to them as 'climbers of trees and men who lived by hunting'. The Europeans simply called them 'woods people'.[49]

They also must have been known for the stone and stone tools they produced. The cobble-beds between Emu Plains and Richmond appear to have been the source of tools and stone for whole region north of Botany Bay – it was a tool-making powerhouse. The gravel beds and paleochannels of the river, creeks and river flats yielded smooth basalt pebbles, chert, mudstone, quartz and red and yellow silcrete boulders. At many places on the plain and the high ground of the Cranebrook ridge to the east, Aboriginal people worked stone into tools and weapons, sharp adze blades and spear points, scrapers and edge-ground axe heads. The tool-makers left hundreds of stone flakes and cores scattered on the ground around them, and these 'workshop' sites were among the major sites located when the Penrith Lakes Consortium commissioned archaeological surveys from 1981.[50]

Smoke was the unmistakable sign of Aboriginal presence, and it was everywhere. Fires in trees smoked out animals, but also left snug little shelters in the trees' bases. Cooking fires in front of them were left alight, and led to the incineration of the whole tree. The Europeans passed many of these trees, flaming like giant torches. Despite the fact that Europeans burned enthusiastically and often, they thought the natives careless and complained that their burning ruined the timber. Fire cracked stones for tools, heated wood so it could be shaped into weapons and implements, hardened shields, and melted sticky resins for fixing stone to wood.[51]

It is likely that the Mulgowie and Boorooberongal used fire to enhance food sources and to clear the forest for easier movement. However the extent to which this was carried out close to the river is not clear, since it was described by the first white explorers as a dense tangle of long sedge, fallen branches, nettles and vines. Yet fire promotes the growth and flowering of the edible tuberous plants which were abundant in the riverflat forests, so some suggest that these areas would have been burnt quite often. There may therefore have been impacts on the flow of water and soil composition and erosion. Available evidence strongly suggests that complex Aboriginal fire-regimes resulted in a patchwork of vegetation types on the Cumberland Plain, as in other parts of the continent.[52] Fire was used in different ways by different groups of people, but we may never know the specificities of burning in the riverflat and Castlereagh forests.

Living in this country must have meant knowing it elementally, holistically and with intense intimacy: what time of the year plants fruited, when the mullet ran, where mussels grew, the life cycle and habits of possums, when to burn and how often and how extensively, where the best stone was, how it flaked when struck. But the people who lived around Dyarubbin would also have known their country spiritually; it would have been saturated in meaning, through stories of origins, law-legends which bound country, people and animals together. The maelstrom of white settlement meant that much of this knowledge was lost.

Yet those fragments which do survive are not frozen glimpses about a timeless, unchanging land; they are dynamic, they writhe with power and movement. The great prowess of humans, animals and sky heroes are linked with powerful eruptions and magic, land deeply gouged and torn up, rushing rivers, drowned valleys, flooded plains.[53]

Early contacts between Aboriginal people and whites were hesitant, curious, friendly and dignified. But when the Europeans began to settle on the Hawkesbury from 1794, violent conflict quickly flared. Unlike the coastal people, the Dyarubbin people used fire to attack the settlers, burn down their huts and destroy their crops. The Hawkesbury-Nepean district was the site of violent struggle between 1794 and 1811, part of the wider war for the Cumberland Plain, said to have ended with the massacre of fourteen men, women and children at Appin to the south in 1816.[54]

And yet, the roads, the river, fields and higher forest lands were also shared. Many Aboriginal people and Europeans knew one another personally. While words and some knowledge about plants and animals most likely crossed between them, the larger, holistic knowledge of country did not. It was the Aborigines who had to find ways of living in a land which no longer belonged to them.[55] Some worked in the fields for settlers, a few owned and held onto their own land. Several Aboriginal women married ex-convicts and their children took both Aboriginal and non-Aboriginal spouses; and their children after them. Some maintained their traditional lifestyles in this district at least until the late 1830s; they also went hunting with whites, and tracked down bushrangers and convict runaways. Others moved onto the larger estates, and were called by new names: the Mulgoa Tribe, the South Creek Tribe. A large number lived in Penrith in the 1850s, and in 1914 one local man remembered that local Aborigines would have a 'roaring time for weeks with corroborees and wild dancing'. A farmer interviewed in the 1990s recalled the 'blacks' camp' in his father's time down near the river on 'Smith's land' at Castlereagh.[56]

By the 1880s though, the consensus among whites here as elsewhere was that the Aborigines were doomed, simply waiting for their demise. Na Daang was named the last 'full-blood' of the Mulgoa tribe. The old woman told her mistress Sarah Shand that she remembered the land before the white people came, and the terror local Aborigines had of the 'wild blacks' from regions further inland. She sang a song, some words in Darug, some in English, which mentioned the McCarthys, an early Catholic family among the long-term settlers. It seems to be a song of dispossession: the refrain was 'All the land belong to Mr McCarthy'.[57]

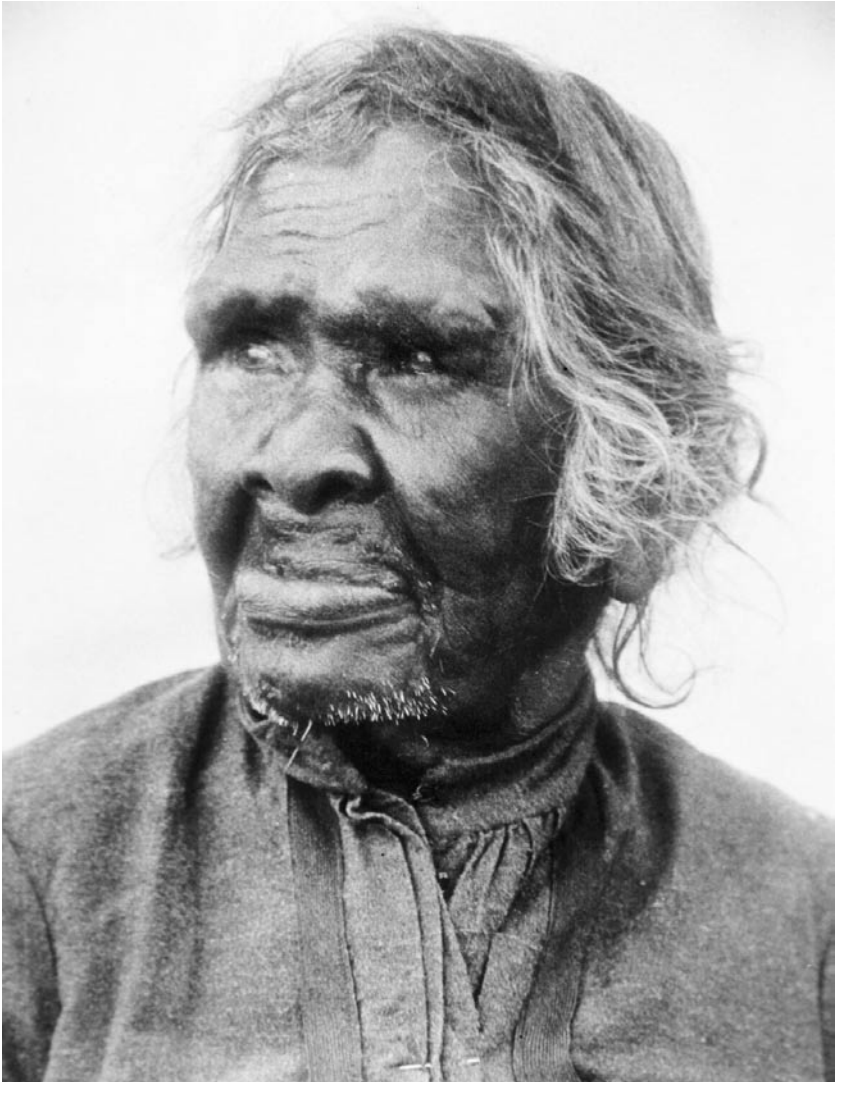

FIGURE 8. Na Daang, also called Black Nellie, about 1880 (courtesy Penrith City Library Local Studies Collection).

HUNTERS AND COLLECTORS, STONES AND WORDS

Meanwhile, white collectors had begun combing the fields of Castlereagh, hunting for stone tools. These collectors amassed hundreds of axe heads, 'pygmy implements' and pebble choppers 'turned up by the plough' and published their findings in learned journals. For them land was a treasure trove, a hunting ground, the stuff of the 'antiquarian imagination'.[58]

The Hawkesbury/Nepean valley was the site of belated attempts at cultural recovery. Pioneer anthropologists and archaeologists came to Castlereagh and Emu Plains to record surviving Aboriginal language and sites. In 1900, the surveyor and linguist R.H. Matthews published a paper which first named the language spoken by Aboriginal people still living on the Hawkesbury as 'Dharruk'. Later, 'Dharruk' (now spelt 'Darug') was adopted as the name for the inland 'tribe' by anthropologists and it continues to be used by the thousands of Aboriginal people of this region today.[59] In 1948, archaeologist F.D. McCarthy from the University of Sydney began to examine the Aboriginal sites around the gravel beds at Penrith and Castlereagh. He found and documented the extensive 'surface workshops' of chips and cores from tool-making, one of them coinciding with the old McCarthy's Farm, the place Na Daang had sung about. Fred McCarthy also carried out the first 'systematic' excavation in NSW in a rockshelter on Lapstone Creek, across the river. From the observations he made here, he developed a model for the prehistory of Sydney and south-eastern Australia: successive phases of Aboriginal occupation, readable in the 'large' and 'small' tool traditions.[60] His model and terminology have been used by archaeologists ever since. As we shall see, it was this type of archaeology, and not local knowledge, which came to dominate the discourse about Aboriginal occupation and cultural heritage at Castlereagh.

WINNING STONE AND SAND: THE QUARRYMEN

Other types of stone-hunting had also begun. Gravel quarrying has been carried out in the Penrith and Castlereagh area since the 1890s, and the early workings were by wet extraction from beaches or from the river itself. Works stretched along the entire course from Penrith to Yarramundi, and when the river bed and banks were completely mined out, the companies turned to land-based or 'off-river' extraction. Gravel and sand mining gathered pace as the companies acquired more and more gravel-bearing lands in the 1960s to feed the great post-war Sydney building boom.[61]

The 'words for country' used by the quarrymen are a fascinating reversal of earlier language. For them it is the gravel beds, not the earth, which are 'rich' and must be 'won'. Once extracted, gravel and sand are 'raw feed' for the processing plants. The fertile topsoils are merely part of the 'overburden' which must be

'stripped', while an un-mineable sandstone outcrop is an 'intrusion'. Should quarrying be prevented for any reason, then the deposit is 'frozen' or 'sterilised' – useless and impotent, an unnatural waste.[62]

Sydney's 1960s building boom was partnered by emerging environmental consciousness. The local government authority, Penrith Council, like most others, accepted that the companies had a right to work their lands and the economic importance and inevitability of extraction. But it became keenly aware of the environmental and aesthetic costs and began insisting on rehabilitation and other environmental requirements. Continuous land acquisition and applications by the companies meant that piecemeal approvals were made, subject to a range of environmental requirements. Council and the newly-formed State Planning Authority (SPA) were concerned that with this piecemeal approach, the companies would leave behind an 'unplanned no-man's land of water-holes' – the usual scenario for Sydney's urban hinterlands. Though the Penrith district was still firmly 'rural lands' in the immediate post-war period, twenty years later it was showing signs of the rapid population growth which had already inundated much of Western Sydney.[63] In 1964, with the suburbs rapidly closing in, Penrith Council issued no further consents to quarry pending the development of a policy dealing with the environmental impacts. Quarrying operations were restricted and the companies began to feel they were 'under threat of closure'. Some already owned and quarried tracts of farmland, 'felt they had the right of continuing use'.[64]

THINKING BIG: PLANNERS AND ENGINEERS

The thinking behind the 'restoration' scheme for Castlereagh which was eventually adopted bespoke the credo of modernity: instead of old-fashioned, piecemeal quarrying, an overall, planned and co-ordinated strategy for mining and rehabilitation was required. The origin of the lakes concept, however, is itself contested. Engineers B.F. Smith and T.M. Smyth claim that the fantasy of a beautiful, aquatic recreation park was first conjured up by Penrith and the SPA at a conference held in 1969. But Warren Pinfold, former Superintendent of Blue Metal Industries, insists that he was the originator. As a local resident and a BMI employee, Pinfold says he felt the urgency of finding a solution which would both rehabilitate the landscape and allow his company to keep operating.[65]

In either case, the creation of recreation lakes was seen as both a practical and 'visionary' solution. It was about forward planning and 'thinking big', the watchwords of postwar urban planning. Cultural ideas about the importance and uses of water bodies for recreation were also central. The State Planning Authority stated that one of its aims was to 'preserve or create in the west of the Sydney Region significant bodies of water to counter-balance the ocean frontages to the east'. Western Sydney, despite the river, was clearly considered

disadvantaged by a lack of water bodies. The Scheme would provide a 'sports oasis' in the 'desert' of Sydney's West. The association of Sydneysiders with beach culture and water sports, indeed their right as citizens to such amenities, was by now a powerful one.[66]

For the quarrymen, the scheme represented a bonanza because the 'large lakes' alternative involved the relocation of Castlereagh Road and the obliteration of the old lanes and easements, giving them complete access to the gravels and sands. A joint venture, requiring their cooperation, meant that Castlereagh would be a virtual, and then a real, *tabula rasa* of 2,000 hectares, unencumbered by the existing cultural landscape and ownership. No longer a series of separate, 'inefficient' quarries, but one huge open-cut mine, 'winning' an estimated two hundred million tonnes of gravel and sand. Five of the companies formed a consortium, the Penrith Lakes Development Corporation (PLDC) in 1980.[67] Meanwhile they continued to buy out the remaining local farmers. Some families went willingly; they saw no future for their children in farming, and felt the tide of city development had finally arrived in Castlereagh. Others refused to sell. They held out against the gravel companies, and ordered the consultants off their properties at gunpoint.[68]

A feasibility study had been carried out by a firm of engineers in 1977. The report quickly sketched out the lakes playground, with swimming, boating and wildlife lakes, and even an 'artificial surf lake' and an 'electrically powered water ski-tow'. Anything was possible. In 1977, this was an exciting and far-sighted proposal. It was go-ahead, it had 'business and government working together', and it would endow Western Sydney with a wonderful piece of infrastructure, not to mention prestige.[69] The 'rehabilitation' of the landscape seemed like a good move for conservation. Staff at the National Trust's city office reviewed the proposal and concluded that the scheme was 'an excellent one, and the mining companies are to be congratulated'.[70] The language of the Scheme planners and engineers was, and still is, suffused with the spirit of modernity, technology, efficiency and 'vision'. There is something almost intoxicating about the scale of the project, the audacity of removing and remaking an entire landscape from the hard shale beds up. As one former CEO remarked: 'We're playing God with five thousand acres'.

What was not mentioned at this initial stage was that the Scheme would remove an entire landscape and community. The original planning appears to have been devised in a state of historical amnesia. It was as if Castlereagh, on the farthest fringe of the city, was already *tabula rasa*, a blank space, free from the tendrils of history and heritage, waiting passively for its exploitation, refurbishment and urban future.

Perhaps still more ironic is the fact that the historic European cultural landscape (let alone the deeper Aboriginal one), was simply not recognised, even by the National Trust, at precisely the moment when natural and urban conservation were at the forefront of heritage battles in the distant city. This was the era of

the world's first Green Bans, the alliances of Sydney people and the Builders' Labourer's Federation to defend their natural and historic environments from rapacious developers and faceless bureaucrats. These campaigns, protests and sometimes violent clashes resulted in the state's first heritage legislation, the *NSW Heritage Act* (1977). Meanwhile, Aboriginal sites, seen as part of 'natural heritage,' had already been protected by a 1969 amendment to the National Parks and Wildlife Act.[71] Thus the newly formed Corporation had to somehow negotiate the requirements of these new protective laws *and* ensure that extraction went ahead uninterrupted.

Misgivings about the Scheme surfaced among heritage professionals and lobby groups in the 1980s, and there were also determined protests from local groups from 1980, with particularly vocal campaign against Development Application 4 (DA4) from 1996. The earlier protests had little impact on the Scheme and later protests came too late to save Castlereagh. The Corporation, perhaps presciently, had already signed a Deed of Agreement with the NSW State Government in 1987, which guaranteed the extraction project and the Scheme's completion.[72]

ENVIRONMENTAL IMPACT STUDIES: CONSULTANTS, GREY LITERATURE AND THE POLITICS OF KNOWLEDGE

The scheme's formative years also coincided with the passing of the *NSW Environmental Planning and Assessment Act* in 1979, which made thorough, professional and objective assessments of environmental impacts mandatory for new developments. Environmental Impact Studies (EIS) were/are usually managed and produced by engineering firms and the *Penrith Lakes Scheme Regional Environmental Study* (RES), published by the Department of Planning in 1984, was among the first such studies to be undertaken.[73] It was the template for three other major studies of the Scheme lands at Castlereagh which preceded each stage of excavation (Development Application 2, DA3 and DA4). In each case, consultants in a multitude of environmental and cultural fields were commissioned to write reports. In 1984, they included experts in water, air and acoustics, biology, Aboriginal archaeology, European heritage, as well as overall economic importance and feasibility, recreation, quarrying and many others. The RES gave the impression that every possible angle of country had been exhaustively and objectively studied. Since then, the Scheme has generated a mountain of this grey literature, prepared by a veritable army of expert consultants. Most of the consultants, like the settlers, artists and scholars before them, came out to Castlereagh from the city.

Some of these and later studies rediscovered and recorded the rich natural and cultural heritage of Castlereagh. But what happened to this information offers lessons in the politics of knowledge. It had to be carefully managed according

to the priorities and inflexible requirements of open-cut quarrying; it had to be translated through the powerful vision of the Scheme itself. For example, in 1982 historical archaeologist Fran Bentley completed a report which found that area's physical, social, scenic and heritage environment reflected almost two hundred years of European occupation, and was thus of outstanding national significance. Bentley says the engineers were indifferent to these findings, and in the published RES, her report was rewritten and reduced to short descriptive account, schematised into harmless tables and 'historical phases'. Of the inventory of seventy-five heritage buildings, sites and features, only five items were scheduled for retention: two early houses (one of which the Corporation did not own) a church and school complex, and two cemeteries. These 'gems' would be preserved, islands of heritage, on the banks of the newly formed lakes. The rest had to go 'due to technical requirements of extraction'.[74]

In 1999 the Corporation commissioned several other historical studies, most notably an excellent comparative study of the cultural landscape of the Scheme lands. This report revealed that the fence-lines here still marked the boundaries of the 1803 settlers' farms. Thus it was (re)discovered that Castlereagh was one of only two surviving early colonial farming landscapes, and that it was the more extensive and intact of the two.[75] But this report was not released, and therefore did not become public knowledge. Today the face shovels and trucks are removing the last of this landscape.

FIGURE 9. Quarrying operations underway near Hadley Park (photo: Benedict Taylor 2005)

With regard to Aboriginal heritage, the EIS system privileges archaeological sites, identified by professional archaeologists, rather than the places, artefacts or knowledge of local Aboriginal people.[76] In spite of the impacts of clearing, farming and earlier collectors, the archaeologist hired by the consortium located forty Aboriginal sites on and adjacent to the Scheme lands over a period of twenty years. The initial reports were also carefully managed in the 1984 RES. Twelve sites not affected by quarrying were included to give the impression that a large proportion of sites were to be preserved, when in fact every one of the nineteen then-known sites on mineable land (61 per cent of the total) were described as 'unimportant' and destroyed. I estimate that a total of 28 sites have been destroyed, at least two of them workshop sites with hundreds of artefacts.[77]

Plotting discrete sites on a map is an odd way to assess Aboriginal heritage, considering the deep and holistic way they must have known and occupied this place. Even this limited title to country was divorced from living Aborigines – the National Parks and Wildlife Service site record cards state that these sites were of 'no importance to Aboriginal people'. But Aboriginal people became aware of the destruction and they did object strongly.[78]

The scientific studies of Castlereagh's vegetation are fascinating in that they shift so radically in interpretation between 1981 and 1996. Early reports stressed the rarity and value of the black clay wetlands and billabongs. But by 1984, and still more in 1996, new biologists hired by the Consortium were mainly looking for rare or endangered species (the Green and Gold Bell Frog in particular), and they measured the local vegetation against the yardstick of pristine wilderness. Valuable and extensive lists of existing plants and animals were drawn up, remnant communities, including some of the now endangered river-flat forest, were plotted on maps. None were considered important enough to preserve. The long-cleared settler landscape was now anathema, for the paddocks were 'featureless' and 'sterile', while the remnant stands were 'weed infested and degraded'; it was a landscape hopelessly diminished by its history.[79]

By contrast, it was generally concluded that the Scheme 'will be advantageous to native fauna' and 'greatly enhance regional biodiversity'. The 1984 RES report had presented a fantasy vision of 'rehabilitated' landscape which would be more environmentally correct, because it would return the land to its pristine condition 'before clearance'. The *tabula rasa* vision was seductive, for in this 'clean sweep', the ravages of history could be undone, and the empty space sparked exotic and exciting visions for the future.[80] So the network of creeks, lagoons and wetlands and the aquifer held in the gravels below were destroyed. Local man Bob Salmond recalled that when a lagoon bank was bulldozed near his farm, they 'let everything flow out on to the ground and die, fish and eels and everything. Just knocked the wall away when they was ready and let everything flow out … [pause] … which was a bit upsetting'.[81]

There has been some success in recreating new wetlands, to some extent using propagules from those which were destroyed; birds are returning to the

area. But the original, confident aim of indigenous vegetation restoration proved a mirage. By 2000 ecologists who reviewed grass and tree-planting trials, inspected the reconstructed earth and the recreated wetlands concluded that, given the massive alteration in soil structure and hydrological patterns, this goal is both impractical and impossible.[82]

The research on water – the river, the aquifer, ground water and stormwater – mainly focused on solving the Scheme's immediate practical problems; thus there was an *a priori* assumption that the scheme would go ahead, and so the development discourse overwhelmed all else. Environmental problems were there to be solved and always weighed against the enormous benefits of the new 'water-oriented leisure facilities'. There were long discussions about the source for water for the lakes, and why it had to come from the Nepean River. Impacts on the Nepean River were assessed, and problems with the reduced flow rate were acknowledged but the report stressed that these had to be seen in the context of the environmental problems of the river generally. The Scheme, it was argued, would 'do less damage that further urban development in the basin'.[83] In more recent years, the role of the Nepean River in supplying the lakes has become a sensitive issue, and has been de-emphasised. The Scheme holds a water extraction licence to divert river water, but only in peak flow periods (greater than 170ML/day at Penrith Weir), in order to replace water lost through evaporation and to flush the lakes. Around 80% of this water is to be returned to the river ten kilometres further north. [84]

Of all the ecological factors involved in remaking the landscape, water remains the key, the 'litmus test', for the whole project, and an enormous challenge to the staff at PLDC. And not just any water – the recreational lakes had to be of primary contact standard to allow water-sports, the *raison d'être* of the Scheme. The first phase of the Scheme was completed with the opening of the rowing lake in time for the 2000 Sydney Olympics. The planned wetland lake is intended to support a biologically diverse community of re-introduced birds, fish, shellfish, amphibians, mammals and plants. The lakes, now filling with rainfall and runoff, must be protected from the same problems which plague all urban water bodies: the negative impacts of urban stormwater (nutrients, turbidity, pathogens and so on), invasive pest species (carp, gambuzia), noxious and environmental weeds (salvinia, alligator weed) and poisonous algal blooms. But all of these have already invaded the lakes, requiring management and eradication programs. All will increase with more urban development outside and within the Scheme. Perhaps it was inevitable that, in May 2005, Penrith Council announced that the abandonment of original aim of primary contact standard water in the main lakes; they will now have 'secondary water quality'. The impact on future recreational activities is unclear. [85]

By 1999–2000, planning for the future development of the Scheme, including a new housing area of 4,000 houses, was underway. Reports were prepared by a team of ecologists from the consulting arm of the CSIRO. These days the 1970s

language of ecological restoration and the 1980s ecological fantasies and business management-speak have been replaced by narratives of urban environment sustainability. Humans must be seen as the 'keystone species' and a sustainable future lies in 'balancing the triple bottom line' of economy, environment and society. But here, once more, the planning assumes Castlereagh, now an open quarry, is a *tabula rasa*, with no history. The ecologists recommend that 'history' be researched so that 'lessons of the past can be learned', apparently unaware that a number of reports had already been completed and that local people with that knowledge still live in the area. At this, the third major transition point in Castlereagh's history, the planning strategies once more start from the present, from the 'a year zero', when history begins. [86]

LANGUAGES OF COUNTRY

Painters, poets, writers and photographers from the turn of the century to the 1940s thought Castlereagh was a beautiful, bountiful landscape, urging that it be treasured and celebrated. But fifty years later, those who wrote about it described it as blank and meaningless, or worn out and degraded, ripe for extraction for the hungry city. The words had changed radically too, of course – EIA reports are largely written in detached, technical and bureaucratic language, while the more recent planning reports employ the jargon of systems analysis and sustainability. Nevertheless the scale of the project, and the prospect of creating new landscapes, continues to excite the planners and engineers, as well as, increasingly, the people of Penrith.[87]

It is clear that those older, deeper understandings of country were ignored in the planning for the Scheme. What has become of such knowledge? Perhaps there is still knowledge about Dyarubbin, the Mulgowie and Boorooberongal among the many Aboriginal voices of Western Sydney, and readable in remaining sites and artefacts. There will be knowledge of the more recent past, and I hope to be allowed to listen.

But, as Rebe Taylor writes of Kangaroo Island in South Australia, dispossession also disrupted and destroyed knowledge to such an extent that 'land, not blood, secretes memory'.[88] This is true of Castlereagh in the sense that settler language and knowledge *is* still current among Castlereagh's white farmers, and it was the Corporation itself which recorded and archived some of this knowledge. These people know the old houses and farms, and which families had belonged in which, who had sold to whom, who had married whom. They can talk of marriages at the little churches, of couples still being tin-kettled on their wedding nights in the 1930s, of peaches and figs that grew wild here before the fly finished them off, of fishing in the days 'when you could eat the fish', of hunting ducks with big muzzle loaders which would 'light up the whole swamp'. Their talk revolves around land and river. They can recall when the waters felt

clean to swim in, they describe the river as 'boiling over' in flood, they track the changes that floodwaters wreak. They are blunt about the destructive impact of quarrying on the local streams, lagoons and the aquifer, the 'beautiful water' which once fed all the farm wells.[89] They mourn the loss of community and the landscape, and they speak of them in the same breath.

Jackie Flowers, a Hadley descendent who still lives at Hadley Park as a tenant of the Corporation, talked about the river and the floods with interviewer Sue Anderson in 1997. She slips between the experience and knowledge of past and present peoples:

> The farmers used to be able to … read the river and the weather here … they know from the rain they've had down south, what the rise in the river will be, and they know to pull the pumps out and they know bring the boat up and don't leave it down the river … you knew it was going to rise, and you could move the furniture upstairs …

Farmers, she says, took the floods in their stride:

> farmers are very good that way … they know how to go along with nature. You can't fight it so what's the point … It just happens … And it sort of balances out, you know. You have bad years, you have good years, you might have a few in a row. But you might have a few good years in a row too. So it works out pretty even.[90]

Most people here did not expect to get rich, get ahead, follow some controlled linear progress: the river still made a nonsense of that. This kind of environmental knowledge is visceral, born of experience, but ironically it has no meaningful place in the EIS system. Of Hadley Park, one of the heritage gems spared drowning, Jackie says 'It's not just the house, it's the whole area … it all fits in together.' The Daruk Local Aboriginal Land Council voiced a similar perspective, pointing out that archaeological sites, taken in isolation, were 'clearly less significant than the same sites in the context of the whole area', an area 'which has always been important to our Aboriginal constituents, and is important to us now'.[91] In contrast, the EIS system fractures landscape and knowledge into a dozen or more expert reports, each busily examining one particular field. Apart from those writing about heritage and the cultural landscape, none saw the sum of the parts. Ironically, the anatomised and professionalised approach of the EIS system, together with the fact that developers finance and control the research, meant that the meaning and significance of this country remained both invisible and irrelevant.

CONCLUSION

The story of Castlereagh is about a real place, about places in the heart, replete with the material evidence and memories of countless generations. Yet it was seen by developers, governments, planners and engineers as blank space hiding a valuable resource, and a place for remaking nature. Faith in technological solutions to future environmental challenges played at least as powerful a role in the decision-making process as scientific and other research; it now seems some of that faith was misplaced. Culture and amnesia shapes the environmental destiny of cities as much as infrastructure and metabolic processes.

Like most places, Castlereagh's history is inseparable from what has been fashioned in words and images about it over time; these constitute different types of environmental knowledge, but they do not necessarily coalesce in any lineal or constructive way. So landscapes once admired and celebrated are now reviled; those which were feared or scorned are now seen as valuable and precious. And where cultural landscapes are re-interpreted as 'disturbance', powerful ideas like 'wilderness' and 'restoration' can be harnessed by dominant groups to justify environmental and social destruction. It is only by historicising environments that the politics implicit in this sort of environmental knowledge are revealed.

Ironically, much of the information for this essay was generated or recorded as a result of the Lakes project itself. New realisations were tied to the certainty of Castlereagh's destruction. It seems we will know far more about this place when it is gone than when it lay there between the river and the early road, the 'real thing from the real past', plainly visible, yet invisible. [92] There is hope of remembrance, if not of return. Yet, as Donald Worster wrote of his Cow Creek in Kansas, once the everyday, lived material signs and elements are gone, 'so much else tend[s] to vanish … from local memory'.[93] The new-minted landscape and the great sheets of water await fresh inscriptions.

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NOTES

[1] Richard White, 'From Wilderness to Hybrid Landscapes: The Cultural Turn in Environmental History, *The Historian* 66, 3 (2004), 557–64.

[2] William Cronon (ed.), *Uncommon Ground: Rethinking the Human Place in Nature* (New York: W.W. Norton & Co., 1996), 20; Donald Worster, 'Nature and the Disorder of History', *Environmental History Review* 18 (1994), 14; Martin Melosi, 'The Place of the City in Environmental History', *Environmental History Review* 17, 1 (1993), 23. See also Jenny Price 'Thirteen Ways of Seeing Nature in L.A.', *The Believer*, April 2006 http://www.believermag.com/issue/200604/?read=article_price.

[3] Griffiths and Robin note the relative paucity of Australian and New Zealand urban environmental history generally, see Libby Robin and Tom Griffiths, 'Environmental History in Australasia', *Environment and History* 10 (2004), 453–4. Doug Benson and Jocelyn Howell, *Taken for Granted: The Bushland of Sydney and its Suburbs* (Sydney: Kangaroo Press, 1990) is a valuable study of Sydney's indigenous vegetation and how it fared after 1788; other studies stress pollution and environmental damage, see N.G. Butlin (ed.), *Sydney's Environmental Amenity 1970–1975: A Study of the System of Waste Management and Pollution Control* (Canberra: Australian National University Press, 1976); Dan Coward, *Out of Sight: Sydney's Environmental History 1851–1981* (Canberra: Department of Economic History, Australian National University, 1988); Sue Rosen, *Losing Ground: An Environmental History of the Hawkesbury-Nepean Catchment* (Sydney: Hale & Iremonger, 1995). Journalist John Birmingham's *Leviathan: The Unauthorised Biography of Sydney* (Sydney: Knopff/Random House, 1999) takes its cues from Mike Davies, *City of Quartz: Excavating the Future in Los Angeles* (London: Vintage, 1992) with its apocalyptic vision of urban dysfunction in Los Angeles. Broader histories such as Geoffrey Bolton's *Spoils and Spoilers: A History of Australians Shaping their Environment* (Allen and Unwin, 1981) also portray the cities as having only negative environmental impacts, although scholars like George Seddon call for a more nuanced recognition of nature in cities, especially Sydney; see his 'Environmental and Social Problems of Cities', *Urbanisation*, University of Melbourne, 1977. Another exception is Tim Bonyhady's *The Colonial Earth* (Melbourne: Melbourne University Press, 2000); Bonyhady demonstrates that the conservation ethic in Australia reaches back to the early years of white settlement. However, as yet this work appears to have had little impact on ecological thinking and widely-held ideas about environmental history and legacies. Urban studies scholars also cover relevant themes such as service infrastructure, housing and technology, see for example Patrick Troy (ed.), *Serving the City: The Crisis in Australia's Urban Services* (Sydney: Pluto Press, 1999); and Patrick Troy (ed.), *Technological Change and the City* (Sydney: Federation Press, 1995).

[4] See Drusilla Modjeska, *Inner Cities: Australian Women's Memory of Place* (Melbourne: Penguin, 1989); Peter Read, *Returning to Nothing: The Meaning of Lost Places* (Melbourne: Cambridge University Press, 1996); Peter Read, *Belonging: Australians, Place and Aboriginal Ownership* (Melbourne: Cambridge University Press, 2000); Clive James, *Unreliable Memoirs* (London: Cape, 1980). There are also some more specialised works in park and garden history, bushwalking and the rise of environmentalism.

[5] Andrea Gaynor, *Harvest of the Suburbs: An Environmental History of Growing Food in Australian Cities* (Perth: University of Western Australia Press, 2006); Heather Goodall, S. Wearing, D. Byrne and A. Cadzow, 'Green Cities: Rethinking Suburban Conservation

Campaigning in Sydney 1940 to 1990', State of Australian Cities Conference, Brisbane, 2005, conference proceedings published February 2006, http://www.gu.edu.au/conference/soac2005/publishedpapers/environmentalcity/env10a.pdf.

[6] Tim Low, *The New Nature: Winners and Losers in Wild Australia* (Melbourne: Penguin, 2003).

[7] Mike Davies, *City of Quartz*; William Cronon, *Nature's Metropolis: Chicago and the Great West* (New York: W.W. Norton, 1992); for discussion of the application of systems theory, see Dan Flores, 'Place: An Argument for Bioregional History', *Environmental History Review* 18 (1994), 8; Adam Rome, *The Bulldozer in the Countryside: Suburban Sprawl and the Rise of American Environmentalism* (New York: Cambridge University Press, 2001). Rome built upon the pioneering work of Kenneth Jackson, *Crabgrass Frontier: The Suburbanisation of the United States* (New York: Oxford University Press, 1985); quote from Peter Coates, 'Emerging from the Wilderness (or, from Redwoods to Bananas): Recent Environmental History in the United States and the Rest of the Americas', *Environment and History* 10 (2004), 411–12.

[8] For discussion see Kathleen A. Brosnan, 'Effluence, Affluence and the Maturing of Urban Environmental History', *Journal of Urban History* 31, 1 (November 2004), 116. Andrew Hurley, *Environmental Inequalities: Class, Race and Industrial Pollution in Gary Indiana*, 1945–1995 (Chapel Hill: University of North Carolina Press, 1995); Joel A. Tarr, *The Search for the Ultimate Sink: Urban Pollution in Historical Perspective* (Akron, Ohio: University of Akron Press, 1996); Martin Melosi, *The Sanitary City: Urban Infrastructure in America from Colonial Times to the Present* (Baltimore: Johns Hopkins University Press, 2000); Martin Melosi, *Effluent America: Cities, Industry, Energy, and the Environment* (Pittsburgh: University of Pittsburgh Press, 2001). For survey discussions of the literature, see Coates, 'Emerging from the Wilderness'; J.R. MacNeill, 'Observations on the Nature and Culture of Environmental History', *History and Theory* 42 (Theme Issue, December 2003), 6–7; Jonathon Keyes, 'A Place of its Own: Urban Environmental History', *Journal of Urban History* 26, 3 (March 2000), 380–90.

[9] See Verena Winiwarter et al., 'Environmental History in Europe from 1994 to 2004: Enthusiasm and Consolidation', *Environment and History* 10 (2004), 501–30, especially 511, 512, 514, 515, 530; overview and summary in MacNeill, 'Observations', 19–20 and Franz-Josef Bruggemeier, 'New developments in Environmental History', *Proceedings of the 19th International Congress on Historical Sciences*, 2000.

[10] Melosi offers an excellent history of the city-as-body idea in 'The Place of the City in Environmental History', 4ff; see also discussion and critique in Marina Alberti, 'Measuring Urban Sustainability', *Environmental Impact Assessment Review* 16 (1996), 384–5; Andreas Dix and Christian Pfister in Winiwarter, 'Environmental History in Europe', argue that 'the analysis of material and energy flows also made it possible to bridge the gap between the social and natural sciences'; it is a 'genuine theory of interaction' (p. 512). Similarly, Stefan Bringezu described socio-economic metabolism as 'a strong concept able to integrate natural science and social science approaches', – practically a Theory of Everything – see 'Introduction' in *Regional and National Flow Accounting: From Paradigm to Practice of Sustainability*, Proceedings of the ConAccount workshop 21–23 January 1997 (Leiden: Wuppertal Institute for Climate, Environment and Energy), 22. Urban policy researchers also commonly use the 'metabolic model', closely aligned with the city-as-ecosystem concept, though often uncritically, see for example Peter W.G.

Newman, 'Sustainability and Cities: Extending the Metabolism Model', *Landscape and Urban Planning* 44 (1999), 219–26.

[11] Alberti, 'Measuring Urban Sustainability', 381, 382; Coates, 'Emerging from the wilderness', 415.

[12] See Clifford Geertz, 'Thick Description: Towards an Interpretative Theory of Culture', in Geertz, *The Interpretation of Cultures* (London: Hutchinson, 1975), 6ff; Raymond Williams, *Keywords: A Vocabulary of Culture and Society* (London: Croom Helm, 1984), 90. Historic-cultural readings/analyses of cities such as Gunther Barth, *City People: The Rise of Modern City Culture in Nineteenth Century America* (New York: Oxford University Press, 1980), and Roy Rosenzweig, *Eight Hours for What We Will: Workers and Leisure in an Industrial City 1870–1920* (Cambridge: Cambridge University Press, 1985) offer suggestive ways to begin to read city environments in cultural ways.

[13] For example Robert Goodland, 'The Concept of Environmental Sustainability' *Annual Reviews* 1995 www.annualreviews.org.aronline; here 'environment' and 'economy' are the substructure upon which the 'social' rests.

[14] Grace Karskens, 'Small Things, Big Pictures: New Perspectives from the Archaeology of Sydney's Rocks Neighbourhood', in Alan Mayne and Tim Murray (eds), *The Archaeology of Urban Landscapes: Explorations in Slumland* (Cambridge: Cambridge University Press, 2002), 69–85; Alan Mayne, *Representing the Slum: Popular Journalism in a Late Nineteenth Century City* (Department of History, University of Melbourne, 1990); Cameron White, 'Picnicking, Surf-bathing and Middle-Class Morality on the Beach in the Eastern Suburbs of Sydney, 1811–1912', *Write/Up, Journal of Australian Studies* 80 (2004), 101–10; Graeme Davison and Sheryl Yelland, *Car Wars: How the Car Won our Hearts and Conquered our Cities* (Sydney: Allen and Unwin, 2004).

[15] See also Robin and Griffiths, 'Environmental History in Australasia'; Taylor, 'Natural Inequalities: Social and Environmental Histories', *Environmental History* 1, 4 (1996). Alberti recognises that 'the quality of urban environments depends on physical elements and socioeconomic conditions *as well as on the culture and values of urban communities*' but also that no means exist as yet to incorporate such values into models for measuring urban sustainability, and so does not attempt to do so ('Measuring Urban Sustainability', 388, 389, 390 my emphasis).

[16] Flores, 'Place: An Argument for Bioregional History'; note that 'bioregional history' is distinct from 'bioregionalism' as a social movement; for a critique of bioregionalism as an approach to environmental study see Donald Alexander, 'Bioregionalism: Science or Sensibility?', *Environmental Ethics* 12, 2 (Summer 1990), 161–73.

[17] Compare with Price's discussion of the 'disappearance' of the Los Angeles River, in 'Thirteen Ways of Seeing Nature in L.A.'.

[18] Allen Kearns, Guy Barnett and Andrew Nolan, 'A Strategy for Ecosystem Rehabilitation and Habitat Construction at Penrith Lakes, New South Wales, Australia', *Proceedings of the 1st International Symposium on Landscape Future* (Armidale: Institute for Bioregional Resource Management, University of New England, 1999).

[19] White, 'From Wilderness to Hybrid Landscapes', 563.

[20] G. Britton and C. Morris, 'Castlereagh Cultural Landscape Study: Assessment and Recommendation', report prepared for PLDC, 1999, 6, 58, 68ff.

[21] Alan Atkinson, *The Europeans In Australia* (Melbourne: Oxford University Press, 1997), 170–1; Brian Fletcher, 'Grose, Paterson and the Settlement of the Hawkesbury', *Journal of the Royal Australian Historical Society* [hereafter *JRAHS*] 51 (1965).

[22] David Collins, *An Account of the English Colony in New South Wales*, cited in Atkinson, *Europeans*, 171.

[23] Benson and Howell, *Taken for Granted*, 21–2, 26, 84–8; Britton and Morris, 'Castlereagh Cultural Landscape Study', 62ff.; R.L. Pressey, 'Survey of Wetlands on the "Black Clay Belt" Nepean Floodplain', report prepared for Kinhill Stearns, Sydney, 1981, and attached covering note, National Trust Archives, Sydney.

[24] Government and General Order, 4 October 1803, *Historical Records of New South Wales*, vol. 5, 230–1; Brian Fletcher, *Landed Enterprise and Penal Society* (University of Sydney Press, 1976), 213–14; Sue Rosen, *Losing Ground*, 22ff.; Atkinson, *Europeans*, 343–4; Britton and Morris, 'Castlereagh Cultural Landscape Study', 35–7.

[25]Benedict Taylor, 'Castlereagh in the 1820s: Grants, Lies and Measuring Tape', draft report courtesy of the author. It is in some ways ironic that fences have become the iconic feature of historic settler landscape.

[26]Britton and Morris, 'Castlereagh Cultural Landscape Study', 49–50; for the history of pesticide/herbicide/fertiliser use and impacts in the Hawkesbury/Nepean valley, see Rosen, *Losing Ground*, 112, 120, 123, 143, 141.

[27] Britton and Morris, 'Castlereagh Cultural Landscape Study', 35, quote 50; James Atkinson, *An Account of the State of Agriculture and Grazing in New South Wales*, 1826, cited in Rosen, *Losing Ground*, 47.

[28] Benson and Howell, *Taken for Granted*, 84–5; Bolton, *Spoil and Spoilers*, 38.

[29] Britton and Morris, 'Castlereagh Cultural Landscape Study', 57–8; 'Old survivors play vital role as home to animals', *Sydney Morning Herald* [hereafter *SMH*] 29 November 1999.

[30] George Bennet, *Gatherings of a Naturalist in Australia*, 1860 cited in Britton and Morris, 40.

[31] Fran Bentley and Judy Birmingham, 'Penrith Lakes Scheme Regional Environmental Study: History of European Settlement', report prepared for Kinhill Stearns and Penrith Lakes Development Corporation, 1983; John Grant, *This Beauteous, Wicked Place: The Letters and Journals of John Grant* (Canberra: National Library of Australia, 2000), 110.

[32] Bentley and Birmingham, *ibid*; Don Godden and Associates Pty Ltd, 'Penrith Cemeteries: Conservation Plans', report prepared for Penrith City Council, November, 1989, 54ff. At Hadley Park is an earlier slab cottage, possibly dating from 1806, which is probably the oldest timber structure in Australia.

[33] Hawkesbury-Nepean Flood Awareness Committee, *Flooding in the Hawkesbury-Nepean Valley*, Sydney, 1994, 3.

[34] D.D. Mann, *The Present Picture of New South Wales* (Sydney: John Ferguson, 1979), f.p. 1811, 8.

[35] Lachlan Macquarie to John Oxley, 23 May 1814, SRNSW Colonial Secretary's Papers: letters received relating to land 1825-58 SR NSW Reel 1149 2/7899; Taylor, 'Grants, Lies and Measuring Tape'.

[36] Grace Karskens, *The Rocks: Life in Early Sydney* (Melbourne University Press, 1997) 12, 47–8; see also Atkinson, *Europeans*, 197–8.

[37] Rosen, *Losing Ground*; Elsie Cuthbert and Gwen Herbert, interview with Sue Anderson, OHM Consultants for PLDC, 1997.

[38] See Richard Waterhouse, *The Vision Splendid: A Cultural History of Rural Australia* (Fremantle: Fremantle Arts Press, 2005).

[39] Helen Proudfoot, *Exploring Sydney's West* (Sydney: Kangaroo Press, 1987), 39–42; see also Richard Waterhouse, 'Australian Legends: Representations of the Bush 1813–1913', *Australian Historical Studies* 13, 115 (October 2000).

[40] Miles Franklin, *Some Everyday Folk and Dawn* (London: William Blackwood and Sons, 1909), 3, 44, 309.

[41] J.C.L. Fitzpatrick, *Those Were the Days* (Sydney: NSW Bookstall Co. Ltd., 1923); Frank Walker, 'Penrith and District: Some Items of Early Australian History', *JRAHS* 2, pts. 2 and 3 (1906), 43–52; George. C. Johnson, 'On Tramp', series of four articles in *The Gazette*, 1904, Mitchell Library, Sydney.

[42] William Freame, 'Reminiscences of a District Veteran' *Nepean Times* 1912, republished by Penrith City Council, 1984; and William Freame, 'Michael Long', *Nepean Times*, 27 February 1926.

[43] Tom Griffiths, 'One Hundred Years of Environmental Crisis', *The Rangelands Journal* 23, 1 (2001), 5–14.

[44] Tom Griffiths, *Hunters and Collectors: The Antiquarian Imagination in Australia* (Melbourne: Cambridge University Press, 1996), chapter 5.

[45] Watkin Tench, *Sydney's First Four Years* (Sydney: Library of Australian History, 1979, f.p. London, 1789), 146–9, 153–5, 223–34.

[46] Britton and Morris, 'Castlereagh Cultural Landscape Study', 26–7.

[47] Na Daang with Sarah Shand, c.1888, *Nepean Times* 18 July 1914, and cited in Lorraine Stacker, *Penrith and St Marys* (Sydney: Kingsclear Books, 2002), 7.

[48] Val Attenbrow, *Sydney's Aboriginal Past* (Sydney: UNSW Press, 2002), chapter 7; James L. Kohen, *Aborigines in the West: Prehistory to Present* (Sydney: Western Sydney Project No 2, 1985), 2–4; Benson and Howell, *Taken for Granted*, 12–15.

[49] Peter Turbet, *The Aborigines of the Sydney District Before 1788* (Sydney: Kangaroo Press, 2001); Attenbrow, *Sydney's Aboriginal Past,* 63.

[50] Attenbrow, *Sydney's Aboriginal Past,* 122–4; F. D. McCarthy, 'The Lapstone Creek Excavation', *Records of the Australian Museum* 22 (1948), 1–34; and see series of archaeological survey reports prepared by J.L. Kohen for PLDC, 1982–1997, NSW National Parks and Wildlife Service.

[51] Attenbrow, *Sydney's Aboriginal Past,* 42, 90, 92–3,113; Benson and Howell, *Taken for Granted*, 15.

[52] Benson and Howell, *ibid.*; J.L. Kohen, *Aboriginal Environmental Impacts* (Sydney: UNSW Press, 1995), chapter 4. Lynette McLoughlin,'Seasons of Burning in the Sydney Region', *Australian Journal of Ecology* 23 (1998), 393–404; Bill Gammage, *Australia Under Aboriginal Management*, Fifteenth Barry Andrew Memorial Lecture, Canberra, UNSW Australian Defence Force Academy, 2002.

[53] Martin Thomas, *The Artificial Horizon: Imagining the Blue Mountains* (Melbourne University Press, 2003), 91–3.

[54] James Kohen, *The Darug and their Neighbours: The Traditional Aboriginal Owners of the Sydney Region* (Sydney: Darug Link and Blacktown and District Historical Society, 1993), 62–7; Carol Liston, *Campbelltown: A Bicentennial History* (Sydney: Allen & Unwin, 1988), 21–3; Michael Martin, *On Darug land: An Aboriginal Perspective* (St Mary's NSW: Greater Western Education Council Collective 1988), 68–75.

[55] Denis Byrne, 'Nervous Landscapes: Race and Space in Australia', *Journal of Social Archaeology* 3 (2003), 169–93.

[56] Kohen, *The Darug and their Neighbours,* 68–70, 92–107; Stacker, *Penrith and St Marys*, 6; Les Perkins, interviewed by Lorna Parr, 1996, Penrith City Library, Local Studies Collection. Smith's land, near Smith's Lane at the northern end of the Scheme lands is the site of an unmineable sandstone outcrop and a major Aboriginal stone-working site.

[57] Sarah Shand, 'Black Nellie', *Nepean Times* 18 July 1914.

[58] For example J.C. Cox, 'Notes and Exhibits', in *Proceedings of the Linnaean Society of NSW*, 5, 271–2; Robert Turner, 'Pygmy Implements', *Mankind* 1 (1932), 110–12. For the broader context and meaning of collecting, see Tom Griffiths, *Hunters and Collectors*. In the 1930s George E. Bunyan, a local butcher from Emu Plains, collected local Aboriginal artefacts, photographed sites and collected stories. He opened a museum in his butcher's shop, taught local history in schools and through tours and wrote for the local newspaper. He lobbied to set up the Nepean and District Historical Society and was its secretary between 1947 and 1960, see Stacker, *Penrith and St Marys*, 4.

[59] R.H. Matthews, 'The Thurruwal Language', *Journal of the Royal Society of New South Wales* 35 (1901), 155–60; Jackelin Troy, *The Sydney Language* (Canberra: Panther Publishing, 1993), 9, 10, 15.

[60] McCarthy, 'The Lapstone Creek Excavation'; J.L. Kohen, 'Report on an Archaeological Survey of the region proposed for the Penrith Lakes Scheme', report prepared for Kinhill Stearns Pty Ltd and the Penrith Lakes Scheme, Sydney, September 1981, 4, 11. McCarthy's Farm was a complex of vernacular rural buildings surviving intact from c.1806 until Blue Metal Industries purchased the property in the early 1970s; it burnt down soon after. See Proudfoot, *Exploring Sydney's West*, 113 and Joy Hughes (ed.), *Demolished Houses of Sydney* (Sydney: Historic Houses Trust, 1999), 112.

[61] Bentley and Birmingham, 'Penrith Lakes Scheme … History of European Settlement', 22; G. Warren Pinfold (former quarry superintendent, Blue Metal Industries), 'Origin of Penrith Lakes Scheme', typescript attachment sent to E. Grogan (General Manager, PLDC) 7 April 1992, PLDC Library.

[62] See Kinhill Stearns, *Penrith Lakes Scheme, Regional Environmental Study* [hereafter *PLSRES*], Sydney, Department of Environment and Planning, 1984; Enviro-Managers Pty Ltd, 'Statement of Environmental Effects Penrith Lakes Scheme Development Application 4' [hereafter DA4], report and appendices prepared for Penrith Lakes Development Corporation Ltd, Sydney, November 1997. Tom Griffiths and Tim Bonyhady (eds), *Words for Country: Landscape and Language in Australia* (Sydney: UNSW Press, 2002).

[63] Peter Spearritt, *Sydney's Century: A History* (Sydney: University of New South Wales Press, 2000), 101, 273. Penrith's population more than doubled to 163,122 between 1976 and 1996.

[64] B.F. Smith and T.M. Smyth, 'The Penrith Lakes Scheme' unpublished paper presented at the 17th Annual Flood Mitigation Conference of NSW , Windsor 27 April 1977, National TrustArchives. This paper was based on Gutteridge Haskins and Davey Pty Ltd,

'Penrith Lakes Feasibility Study, Interim Report', prepared for the Penrith Lakes Scheme Working Party, Sydney, 1976; Pinfold, 'Origin of Penrith Lakes Scheme'.

[65] Smith and Smyth, *ibid*.; Pinfold, *ibid*.

[66] Smith and Smyth, *ibid*.; 'Sports Oasis out West', *SMH* 14 April 1986; but compare with residents' attitudes in 'Beach? No Mate, we've got the Nepean', *SMH* 12 January 1991.

[67] The original constituent companies were Blue Metal Industries, Farley and Lewers, Gravel and Sand Supplies, Pioneer Concrete and Ready Mixed Concrete. Mergers and takeovers mean that today there are only three – Boral Ltd, Pioneer International Ltd and CSR Ltd; see Pinfold, 'Origins of Penrith Lakes Scheme', and Enviro-Managers, 'Statement of Environmental Effects Penrith Lakes Scheme DA4'.

[68] Smith and Smyth, *ibid*. 6ff; Interview, Fran Bentley with Grace Karskens, 16 October 2004.

[69] Gutteridge, Haskins and Davey, 'Penrith Lakes Feasibility Study'.

[70] National Trust of Australia (NSW), Review of proposed Penrith Lakes Scheme, 3 November 1977, National Trust Archives; *Windsor Richmond Gazette* 23 March 1977, 4 May 1977, 3 May 1978, *Windsor Courier* 21 April 1977; see also *SMH* 22 July 1980 'Quarry will Become a Huge Lake'.

[71] Meredith Burgmann and Verity Burgmann, *Green Bans, Red Union: Environmental Activism and the New South Wales Builders Labourers' Federation* (Sydney: University of New South Wales Press, 1998), Part 3; Denis Byrne, Helen Brayshaw and Tracy Ireland, *Social Significance: A Discussion Paper* (Sydney: National Parks and Wildlife Service, 2003), 23, 129.

[72] Protest groups include the Castlereagh Residents Action Groups (1980), the Lambridge Preservation Society (1982), the Cranebrook Village Residents Action Group (1982), the Lower Blue Mountains Conservation Society (c.1980) and Friends of the Nepean (c.1996). See also National Trust of Australia (NSW), 'A Submission on the Penrith Lakes Scheme Regional Environmental Study', Sydney, June 1984, National Trust Archives; Marilyn Jones, Secretary, Friends of the Nepean, to Graham Quint, National Trust of Australia, 7 April 1997, National Trust Archives; Friend of the Nepean, 'Submission regarding the contract between the Penrith Lakes Development Corporation and the State Government', submitted to the NSW State Government, April 1997; *Sydney Morning Herald* 12 August 1987, see also 14 April 1986 and 7 April 1998; *Penrith Press* 26 September 1995; PLDC and NSW State Government, *Penrith Lakes Scheme Deed of Agreement*, 1987, PLDC Library. The Deed of Agreement also involved a deal for the completion of the Sydney International Rowing Complex, the venue for rowing events during the 2000 Sydney Olympics (see Figure 3).

[73] Ben Hills, 'Disturbing Developments: The Engineers of our Environment', *SMH* 23 March 1991. For an assessment of EIS accuracy, see Ralf Buckley, *Precision in Environmental Impact Prediction: First National Environmental Audit, Australia* (Canberra: ANU Press, 1989); Kinhill Stearns, *PLSRES*.

[74] Bentley and Birmingham, 'Penrith Lakes Scheme Regional Environmental Study: History of European Settlement'; Fran Bentley, interview, cf. Kinhill Stearns, *PLSRES*, 11.4 to 12.

[75] Britton and Morris, 'Castlereagh Cultural Landscape Study'.

[76] For discussion see Denis Byrne et al., *Social Significance*, Part 1.

[77] Kohen, 'Report on an Archaeological Survey', 1981, cf. Kinhill Stearns, *PLSRES*, 11-2 to 4; Kohen, 'An Archaeological Survey of the Penrith Lakes Scheme: The DA2 Area', report prepared for PLDC, June 1986; Kohen, 'An Additional Archaeological Survey of the Penrith Lakes Scheme: The DA2 Area at Cranebrook and Upper Castlereagh', report prepared for PLDC, September 1986, 10–12; Kohen, 'Review of Archaeological Significance … DA3 Area', 1994, 10, 15–16; Kohen, 'Archaeological Investigations in the DA4 Area', 1997, 6.

[78] Daruk Local Aboriginal Land Council [DLALC], 'The Penrith Lakes Scheme: An Aboriginal View', report, March 1996, PLDC Library.

[79] Pressey, 'Survey of Wetlands', 1981; cf. Kinhill Stearns, *PLSRES*, 10-1 to 10; Kevin Mills & Associates, 'Flora and Fauna Study', in Enviro-Managers, 'Statement of Environmental Effects … DA4', Appendices, 1997, cf. Britton and Morris, 'Castlereagh Cultural Landscape Study', 7, 62ff. recording remnants of endangered riverflat forest.

[80] During the 1980s these included suggested themes, such as 'Rainforest Gully', 'North American Flood Plain' or even 'Palm Beach', see S.S. Rees, Landscape Manual, PLDC 1987. Later the language of business management was introduced to the process of environmental rehabilitation, with a 'focus on desirable strategic outcomes', and the environment 'balanced' against 'associated business constraints' (Kevin Mills & Associates, 'Flora and Fauna Strategy', PLDC, 1988).

[81] Kinhill Stearns, *PLSRES*, 10.6–10; Bob Salmond, interview with Mary Ann Hamilton, OHM Consultants for PLDC, 1997, PLDC library.

[82] Allen Kearns, M. Doherty, F. Vogt, G. Barnett, 'A Strategy for Ecosystem Rehabilitation and Habitat Construction at Penrith Lakes', report for PLDC March 1999, 14–15; and analysis of problems of reconstructed soils in G. Barnett, D. Tongway, M. Doherty and A Kearns, 'An Ecosystem Function Analysis and Assessment of Ecosystem Rehabilitation at Penrith Lakes', report for PLDC March 1999; pers. com. Allen Kearns and Guy Barnett, 11 February 2004.

[83] Kinhill Stearns, *PLSRES*, 8.10–14. This conclusion was contested by Peter Crawford, chairman of the Healthy Rivers Commission, who publicly stated that the 26,000 megalitres of water drawn from the Nepean would place the already 'critically sensitive' stretch of the river under further stress, see *SMH* 'Lakes Too Much for Stressed River', 7 April 1998 and Healthy Rivers Commission of New South Wales, *Independent Inquiry into the Hawkesbury-Nepean River System, Final Report* (Sydney: August 1998), 85.

[84] UMR Research Pty Ltd 'Public Attitudes Survey of Penrith Residents' prepared for PLDC and CRI, December 1998. The report found that water quality in the Nepean was a 'strong underlying concern', 5; Hawkesbury-Nepean River Management Forum, Department of Infrastructure, Planning and Natural Resources, *Water and Sydney's Future: Balancing the Values of Our Rivers and Economy*, Sydney, the Department, March 2004, 6.

[85] Guy Barnett, Brendon Baker and Allen Kearns, 'Design Principles for Urban Sustainability', prepared for PLDC, April 2000, see especially Chapter 3; Sydney Water Board, 'Preliminary Report: Algal Growth Potential of the Penrith Lakes', report for PLDC, West Ryde, Sydney, 1990, PCL/LSC 16–20; pers. com Neil Cain, Penrith Lakes Environmental Education Centre, 7 December 2004; pers. com. Professor Maria Byrne, Dept. Anatomy and Histology, University of Sydney, 2 February 2005; Penrith City Council, 'Information Paper: Proposed New Urban Area in Penrith', May 2005, see http://www.penrithcity.nsw.gov.au/index.asp?id=2105; primary contact quality water will only

be maintained in the rowing and warm-up lakes, now part of the Sydney International Rowing Centre.

[86] Brendon Baker, 'Introducing Urban Sustainability at Penrith Lakes, Sydney', paper given at the International Local Agenda 21 Conference, 2002; http://www.adelaide.sa.gov.au/soc/pdf/baker.pdf; Kearns et al, 'A Strategy for Ecosystem Rehabilitation'; Barnett et al, 'Design Principles for Urban Sustainability'; Kearns et al., 'A Strategy for Ecosystem Rehabilitation and Habitat Construction'; for discussion see Grace Karskens, 'The Penrith Lakes Scheme and Old Castlereagh: History and Sustainability at Sydney's Urban-Rural Interface', paper given at the European Society for Environmental History Conference, Florence, 2005; see Debra Bird Rose, 'The Year Zero and the North Australian Frontier', in D. Bird Rose and Anne Clark (eds), *Tracking Knowledge in North Australian Landscapes* (Canberra and Darwin: Australian National University, 1997), 19–36.

[87] UMR Research Pty Ltd 'Public Attitudes Survey of Penrith Residents' found that most respondents were very positive about the Lakes Scheme, 7.

[88] Rebe Taylor, '"All I know is History": Memories and Land-Ownership in the Dudley district, Kangaroo Island', in Meaghan Morris and Stephen Muecke (eds), *UTS Review, The Archaeology of Feeling*, vol. 5 no. 1 (May 1999), 17.

[89] Les Perkins, Billie Childs, Effie Smith, interviews with Lorna Parr, 1996, PCL/LSC; Bob Salmond, Colin and Helen Dixson interviews with Mary Ann Hamilton and Sue Anderson, OHM Consultants for PLDC, 1997.

[90] Jackie Flowers, interview with Sue Anderson, OHM Consultants for PLDC, 1997.

[91] Frank Vincent, Chair, Daruk Local Aboriginal Land Council, to Peter McGhee, PLDC 21 February 1996, PLDC Library.

[92] Bernard Smith, 'History and the Collector' [1974] in Bernard Smith, *The Death of the Artist as Hero: Essays in History and Culture* (Melbourne: Oxford University Press, 1988), 69.

[93] Donald Worster, 'Paths Across the Levee', in Donald Worster, *The Wealth of Nature: Environmental History and the Ecological Imagination* (New York: Oxford University Press, 25).