

Gilbert White never came this far South. Naturalist tales and environmental meta-narratives.

In this presentation I look for epistemological guidance in naturalist tales. I suggest a prototype of naturalist knowledge as structured around a life and a place. I use some examples to explore some educational implications of this reading of 'naturalist'.

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Abstract.

'Naturalist' is a complex category which contains opposites. Depending on what prototypes of 'naturalist' are selected, 'naturalist' knowledge may be seamlessly absorbed by universalist themes in globally oriented environmental education, and incorporated into the abstractions of formal education. But that is not the whole story, and the category 'naturalist' also comprises narratives based on ontological assumptions and epistemological interests which help to define some limitations to universalising and abstracting tendencies frequently encountered in outdoor environmental education. The historical, cultural, and political parallels which can be drawn between Canada and Australia are not matched by ecological parallels. Comparisons between the two are well suited to help understand the tensions between environmental education imperatives particular to certain places, and universalising themes which echo the historical influence of colonisation by western Europe and the contemporary influences of globalisation. In the reading of what it means to be a naturalist which I present here, I use the image of the intertwining of autobiography and the natural history of a particular place as an organising theme around which to discuss some limits to outdoor environmental education, and the explore some hitherto often neglected possibilities.

Gilbert White never came this far South. Naturalist tales and environmental meta-narratives.

'It is, I find, in zoology as it is in botany: all nature is so full, that that district produces the greatest variety which is the most examined'.

Gilbert White, letter to Pennant, October 8, 1768 (White, 1993 orig. 1789, p. 51)

In 1789¹ Gilbert White published *The Natural History and Antiquities of Selbourne* ('Selbourne'). White was almost 70 at the time, and Selbourne was the culmination of 20 years work. Described by the editor of my Oxford edition as artless, and by its author as parochial², 'Selbourne' was published initially by White's relatives. 'Selbourne' nevertheless became, according to Allen (1976), the only literary classic in the field of natural history. It has appeared subsequently in over 200 editions. It is not only "the most published scientific text", but also, according to Foster (1993, p. xxviii) "a literary classic rivalled only by works such as the Bible, Shakespeare's plays, and Bunyan's *Pilgrim's Progress...*". Charles Darwin was influenced by 'Selbourne' (Allen, 1976; Stewart, 1995); it was one of Thoreau's favourite books (Stewart, 1995) and it is credited by Worster (1977) with the rise of the nature essay in the latter half of the 19th century in the USA. 'Selbourne' takes the form of a series of letters, whose contents may at first seem unstructured, and to lack a consistent literary style. Both of these impressions only add to the enigma of 'Selbourne's' enduring appeal, and not surprisingly 'Selbourne' has attracted considerable scholarly attention. My intention here is to use 'Selbourne' as a focal point for some questions about the role, or roles, of natural history knowledge in contemporary environmental education, especially in the region of Australia where I live and work. 'Selbourne's' enduring appeal is probably sufficient reason for this, but 'Selbourne's' location in time and place, and its distinctive qualities, particularly recommend it.

A life in a place

If it is imagined that the reader has been invited to stay in White's cottage, joining him on some rambles in the nearby countryside and sharing evening discussions over the question of whether swallows hibernate, or the structure of a fern-owl's claw, the aptness of White's approach to writing 'Selbourne' is evident. Read in this way, 'Selbourne' is infused with the tone and texture of experiences guided by curiosity,

¹ Actually late 1788; by convention the book was dated the next year (White, 1993 orig. 1789).

² Not a disparaging term at the time.

melded with careful observation, and premised on the expectation of a lifetime in the one area. White is a careful and systematic observer; but 'Selbourne' retains the qualities of contingency and immediacy which attend observant walking. It is certainly my experience that plants are not arranged in textbook order; creatures do not appear according to taxonomic rank, and the sequence of thoughts and mental associations of a walker are not neatly arranged like the topics of a syllabus. This is not to deny that White's rambles were guided by interests and intentions; he makes particular enquiries, he seeks specific things, and he links his observations with contemporary scientific debate, the works of previous authors, and his knowledge of natural history in other places. He unostentatiously evidences his classical education. What he doesn't do (although some editors in attempting to improve his work have done (Foster, 1993)); is take any of these as guiding his literary structure. He instead retains a sense of how his local area would appear were he to unhurriedly guide you through it.

Generations of nature essayists have eclipsed White in literary refinement. Makers of nature documentaries have succeeded in creating realities which quotidian nature cannot match (Siebert, 1993); time and space are stretched, compressed, edited and re-arranged, according to the grammar of television narrative. In televised nature, cultural tendencies to equate truthful representation with perspective drawing (Evernden, 1992) and photographic realism, are taken far beyond the limits of ordinary human vision. More so than at any time in human history, 'nature' connotes nature *writing* and nature *documentaries*. I am inclined to think 'Selbourne's' artlessness is genuine; White's intention was not to spawn a literary genre, but to invite others to study the world around him with the same patience, interest, and empathy he did.

Part of the appeal of the term 'naturalist' is that it has so many connotations and invokes so many exemplary figures: Charles Darwin, Henry David Thoreau, Rachel Carson, Alexander von Humbolt, the bird expert in the local outdoor club, the primary school teacher who introduced you to caterpillars. However the polysemy which gives the term such rich associations may also impair discussion of the place of natural history knowledge in environmental education (see for example (Van Matre, 1994)). 'Naturalist' contains opposites (see (Mabey, 1995)) and my choice of 'Selbourne' is partly a semantic device to help navigate the mire of contradictory meanings. It is not my contention that 'Selbourne' is an archetype for the place of natural history in environmental education, nor do I wish to treat Selbourne (the place) as an ideal type. However, 'Selbourne's' ontological basis – a life in a place – and the way its epistemology blends broad intellectual interests around rambles in the countryside, reward careful consideration.

‘Selbourne’ offers an epistemology centred on a lifetime relationship with a relatively small area. Written in a particular part of England when Britain was near the height of its colonial power, and at a time when institutionalised, professional natural history was in its infancy, it also offers a truly antipodean perspective on natural history when read in Central Victoria at the beginning of the 21st century. ‘Selbourne’ is an often cited point of departure for historical accounts of modern environmentalism (for example (Worster, 1994)), including the rise of American-centred views of nature (for example (Nash, 1982, 1990; Shore, 1994; Stewart, 1995))³. ‘Selbourne’ appeared one year after the first British convict colony was established in Australia at Sydney Cove and five years after the loss of Britain’s American colonies. Although naturalists were active in Australia from the beginning of European settlement, for the first hundred years of settlement their role was mainly confined to contributing specimens to collections housed in Europe. Local field naturalist clubs were not established until the 1880’s (Bolton, 1992). In a reversal of the order of events in Britain and the USA, the institutionalisation of natural sciences in Australia, from around the middle of the 19th century, (Moyal, 1976), preceded any significant development of local, amateur natural history by decades.

How should knowledge of *actual* places shape how environmental education is envisaged? Environmentalism, the natural sciences, and environmental education did not arise gradually in Australia from collective experience of the land, as was the case in Britain and America; collective experience of the land for most non-indigenous Australians was and remains limited. When a student of environmental education in Australia reads in Orr: “we can begin to reinhabit our places” (1992, p.131), ‘we’ may be read as referring to contemporary Australians, or to another ‘we’ centred on the USA but so naturalised through cultural influence as to pass unnoticed – a universal, placeless ‘we’. For Orr, ‘reinhabitation’ refers to pastoral or Arcadian ideals articulated by Thoreau and having some links, albeit perhaps mythic, to the past. In Australia there never was an Arcadian period. Considering the question more locally, to what extent is it justifiable to conduct or plan environmental education without first getting to know the region and communities in which the program will be implemented? (White’s view, it seems, was that a lifetime’s careful observation might just qualify one to provide some modest instruction to others). I am mindful here of some advice I remembered when my wife and I came to build our house. The advice, published in a newspaper by a nature columnist who had retired to the country, was to spend several seasons observing your land before deciding where to build. Whatever the prospective builder might know

³ See Grove (1995) for a critique of unwarranted emphasis on North American influences in the history of environmental conservation.

about ecological principles, species lists for an area, environmental design, and so on, there remain details which can only come from familiarity. Where do the kangaroos come down to feed? Where are the orchid patches? Do they flower every year? Where does the water lie after a Spring downpour? This turned out to be good advice so far as house-building goes. I want to consider some of the implications of following equivalent advice in environmental education, following an approach exemplified in ‘Selbourne’: first, know your place.

It might be argued that White’s legacy simply came belatedly to Australia. Although ‘Selbourne’ had little influence in Australia in the 19th century, because of the timing of Australian colonisation (while Thoreau was laying the foundations for American environmentalism in Concord, and the Victorian craze for natural history was flourishing in Britain, the first European settlers were entering Central Victoria seeking grazing land, followed shortly by greater numbers in gold rushes of the 1850’s) his influence could be said to have emerged later through subsequent developments in natural history and environmental education. It is plain that in the 20th century British and American influences in Australia have shaped school nature study (especially until the 1970’s), and school environmental education. The same can be said for the overall conceptual landscape from which these emerged, particularly the contributions of field naturalist clubs, nature writing, and conservation movements. Approaches to forestry and national park management, and of course the natural sciences, are broadly indebted to Anglo-American influences. In a sense, Gilbert White did come to Australia via these routes and through the influence of writers such as Orr (1992) and Livingston (1994), who have developed the theme of ‘place’ and personal experience in environmental education.

Practices and understandings which can be linked to ‘Selbourne’ as a matter of historical curiosity are one thing; contemplating a contemporary Australian role for the kind of natural history White engaged in is another. White intended his project to generalize only in the sense that he considered every district would reward the same attention which he paid to Selbourne. ‘Selbourne’s’ apparent artlessness is partly due to White’s disinclination to derive abstract conclusions which could be dis-embedded from Selbourne and re-imbedded in, say, Central Victoria; that is a more modern obsession (Giddens, 1992). As I discuss below, almost from the time of British colonisation what most Australians have not done is live and observe as White did. It is not easy to envisage how White’s particular approach to natural history could be incorporated into environmental education, either in schools, or in communities. ‘Selbourne’ was the culmination of a life-time’s observation – White granted a primacy to experience and observation, and took local knowledge to be intrinsically worthwhile. Moreover, White

did not experience Selbourne on his own. Just beneath the surface of ‘Selbourne’ generations of herbalists, poachers, farmers and kitchen gardeners inhabit the world from which White’s understandings emerge. White was an outstanding figure, but interest in natural history was widespread in Britain, including among the lower classes (A. Secord, 1996; Thomas, 1984). Understanding natural history as communal knowledge, with important local aspects, suggests natural history education entails constructing social relationships. The possibility that natural history education in Australia should entail attention to and intervention in patterns of experience, not of ‘nature’ but of particular regions by particular communities, if nothing else, emphasises the immensity of the problem of environmental education in Australia.

Central Victoria is neither Selbourne, nor Walden Pond (nor the Yukon).

It may be helpful here to offer some points which illustrate the distinctiveness of the problem of environmental education in Australia. Here, as Bolton (1992, p.23) puts it “[s]eldom were so few people in possession of such power to shape the environment of so much of the earth’s surface”; moreover, in comparison to other nations, “Australians have yet had less collective opportunity of getting to know their environment and learning how to come to terms with it” (ibid). Paradoxically in a large land (8000 square km) with a small population (20 million) almost since the time of first settlement, most Australians lived in cities. However British occupancy of the continent (apart from arid areas) was rapid. In 1815 most settlement was within 100 kilometres of Sydney; within fifty years all of the land in eastern Australia which would be taken up for economic use had been (Bolton, 1992, p.22). This period of rapid occupation has been characterised as a search to find an imaginative hold on country conceived as an empty page (Carter, 1988). The need to *occupy* the country, legally, effectively and morally (Day, 1997) (and it should be added conceptually) has remained a national obsession. European colonisation of Australia has from the outset been characterised by struggles to impose European categories and concepts on a landscape where experience confused even the most general metaphors, such as ‘tree’ or ‘river’. Trees shed bark and limbs and refused to offer shade. Rivers failed to converge to the sea, and instead dispersed seasonal floodwaters across desert plains. Seasons failed to behave seasonally and pastures failed to sustain stock after one or two seasons – many native plants did not survive sheep grazing, and did not return even when a pasture was spelled (Bolton, 1992)⁴. The

⁴ In northern latitudes ecosystems in areas covered by ice in the last ice-age are characterised by relatively few species which share robust, invasive habits. Many Australian ecosystems reflect a very long evolutionary history and high levels of specialisation and diversity.

colonisation of Australia has proceeded ‘influenced neither by the ideals of aristocratic taste nor by the sense of familiarity and appreciation which comes from generations of experience’ (Bolton, 1992, p. 23).

The biogeographical reasons why European colonists encountered such differences are well-known. One hundred million years ago, Australia, together with Antarctica, Africa, South America and India was part of the Southern super-continent Gondwanaland. Around 45 million years ago, when mammals and flowering plants were beginning to evolve, Australia split away and began drifting to its present position (Smith, 1986). Settlers in Australia thus encountered very different evolutionary branches from those encountered in either Europe or the New World, and considerable diversity (table 1). The history of early settlement is in part a story of struggles to come to terms with the incomprehensible nature of nature in Australia (Martin, 1993), often, but not always through attempts to conceive of the land in imported terms, not to mention attempting to improve its conformity with European expectations and aesthetics (Bolton, 1992)⁵. Often Australia was found wanting in comparison to imported norms and expectations. Flannery (1994) recalls, as I do, acquiring in primary school the distinct sense that ‘nature’ in Australia was somehow inferior to ‘nature’ in Britain or the United States. It remains common for contemporary, successful indigenous species to be referred to as ‘primitive’, or for soils which support a rich and diverse indigenous flora to be described as ‘infertile’. Normal climatic variation – Australia is a land of ‘drought and flooding rains – is treated as anomalous⁶. The introduction of European farming practices, and non-indigenous species caused profound ecological disruption, the impacts of which continue to reverberate. Cattle and sheep, for example, compacted soil (Australia has no native hoofed animals) eliminated certain plants, and spread weeds (Bolton, 1992; Low, 1999). Rabbits when introduced multiplied in extraordinary numbers⁷ to devastating effect on native vegetation.

	Canada	Australia
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⁵ Attitudes to hunting wildlife, for example, developed as a reaction to the restrictions of British game laws.

⁶ The ski industry provides a good example of this, perpetuating the myth of a ‘normal’ year in spite of overwhelming evidence that snowfalls in Australia are highly variable.

⁷ Interpreting the impact of introduced species on Australian ecosystems is confounded by persistent beliefs that Australian species are inferior (Flannery, 1994), and mistaken notions of evolution in terms of competition between species, rather than optimisation of ecosystems, and evolution as either a ladder of progress or cone of increasing diversity (rather than a branching tree). On the latter point see (Gould, 1991)

Water	Most freshwater of any country	Driest continent - half the continent has water courses which are seasonal, mostly dry, and do not reach the sea. 70% receives less than 500 mm per year 30% less than 200 mm year. Rainfall is highly variable from year to year Large areas have fewer than 25 days of rain annually
Number of flowering plants species (endemic % in brackets)	3000 (3 %)	20 000 (85%) 76 known extinctions 1000 vulnerable or endangered
Number of mammals (endemic in brackets)	194 (approx 1 or 2 species)	268 (84%) 19 known extinctions 47 endangered or vulnerable 25 introduced since white colonisation
Birds	426 (? a handful)	777 (45 %) 20 known extinctions 50 endangered or vulnerable 32 introduced
Amphibians and reptiles	84	973 incl 770 reptiles 3 known extinctions 80 endangered or vulnerable
Forest cover	25%	5% (10% at time of white settlement) In Queensland land clearance presently 400 000 hectares per year
Topography	varied	Mostly relatively flat

Table 1. Some comparisons between Canada (10 million km²) and Australia (7.7 million km²)

This is a short version of a very long story. However, adding more detail would simply reinforce the point that many aspects of Australian environmental experience are distinctive, and demand equally distinctive educational responses.

Making sure Australians know their places.

The colonisation of Australia coincided with changing realities and knowledge regimes throughout those regions of the world in which western European cultural influences predominated. The power of organised science largely overwhelmed the importance of local, personal knowledge, while at the same time industrialisation and urbanisation transformed everyday experience. Literally and conceptually nature became more distant. The implications of these shifts are an important theme in contemporary environmental literature (for example (Evernden, 1992; McKibben, 1990)), and significant contributors to the environmental education literature, albeit not necessarily of the mainstream, have grappled with the educational consequences of these

epistemological shifts (for example (Bowers, 1993; Livingston, 1994; Nabhan & Antoine, 1993)).

It would be difficult to underestimate the importance of this work. But what my reading of 'Selbourne' suggests, and what the sketch above of the particularity of Australian environmental history implies, is that not only are understandings derived in Anglo-American cultural, historical, and physical environments an incomplete basis on which to develop environmental education in Australia; in some circumstances they may be as unsuited to the Australian environment as are some imported farming practices. Undoubtedly much that is true of environmental education elsewhere will be true in Australia, but the only way to be certain of that is to attend to local circumstances.

I will use Orr's essay 'Place and Pedagogy' (in (Orr, 1992)) to illustrate this point, not because it demonstrates a lack of awareness of some of the issues discussed here, but because it does. It therefore well illustrates how difficult incorporating something like White's approach to knowledge in Australian education might be. Beginning his essay with Thoreau, Orr remarks: 'Ultimately, Thoreau's subject matter was Thoreau: his goal, wholeness; his tool, Walden Pond; and his methodology, simplification' (Orr, 1992, p. 125). Later, he suggests four reasons for incorporating 'place' into teaching. He contends that experience combined with intellect educates the whole person; that knowledge of place is general, compared to the specialisation of disciplinary knowledge; the experience of place allows students to apply (rather than simply comprehend) knowledge; and that learning to dwell is the heart of American community and democracy and psychological health. Later, he characterises the approach he is advocating as reinhabitation (Orr, 1992, p. 131).

Through Orr, Walden Pond becomes not so much a place as a prototype for 'place'. Orr suggests that 'dwelling' in a place heals the individual and provides self knowledge (perhaps of a transcendental or spiritual kind). Individualism is a distinctively American characteristic (Bellah, Madsen, Sullivan, Swidler, & Tipton, 1986), and is, according to Bowers (1993), one aspect of a western mindset implicated in environmental problems. Whereas White envisaged every district in Britain being accorded the same attention he did to Selbourne, for Orr 'place' is generic and knowing the place becomes knowing the self. It is true that abstraction is to some extent an inevitable consequence of writing about place. Nevertheless Orr introduces a permissiveness in terms of *which groups* should know *what* about *which* places in the contexts of what experiential relationships. It may be important, for example, that communities in areas where there are small patches of remnant native grassland learn to recognise and appreciate such areas. There is no reason to suppose this particular knowledge, linked in an important way to

ameliorating the effects of past inattention to indigenous flora, will necessarily come simply from individuals developing a sense of place. Indeed, many Australians do attempt to reinhabit place by attempting to reconstruct European landscapes in rural Australia or in their backyards; a short walk around the rural city of Bendigo, near which I live, will convince any visitor of the truth of this.

Orr's position is not strictly individualistic, since he also links 'place' and an ideal democratic community. I will leave aside the question of whether reinhabiting the past is an appropriate metaphor for an American context, or whether it invokes a myth. However, considered in other parts of the globe, returning to place-bound roots does not obviously lead to democracy and Arcadia. How do migrants or refugees in any country reinhabit? How should reinhabitation be interpreted in Germany, where blood on the soil nationalism is so closely implicated in 'place' and the roots of nazism (Schama, 1995). What does reinhabitation mean in Britain if one moves up or down the social scale from Gilbert White? Considered in other contexts – the Balkans, the Middle East, or Australia (at least from environmental or indigenous perspectives) – the association between the past, place, and political ideals is by no means benign. Certainly in Australia the past is mostly occupied by the roots of contemporary environmental problems; there is little to be gained by returning there.

One more point. Orr offers an epistemological distinction between outdoor experiences and school knowledge. He suggests a dichotomy between fragmented, specialised, discipline-based knowledge, and natural history experiences which embody wholeness and generality. At least in the Australian contexts I am concerned with this is not a helpful distinction. All knowledge is selective and partial, including experiential knowledge of local natural history. Had Gilbert White different interests; had he taken different paths, on different days, 'Selbourne' would have been a different book. At any given time – for example when he stopped to consider gossamer in a field – he might instead have chosen to attend to the sounds of crickets; or to investigate the roots of a plant, or to closely watch beetles on a leaf. An interest in mushrooms (Fine, 1998) constructs a different world from an interest in birds (Jardine, 1998). Read in an Australian context (which Orr may not have had in mind), Orr's account of 'place' in education fails to confront the immensity of the task of constructing communal relationships with nature appropriate to and commensurate with the environmental problems now evident. Local knowledge is not monolithic. Nor is it finite. As White (1993 orig. 1789, p. 51) has famously put it (letter to Pennant, October 8, 1768): 'It is, I find, in zoology as it is in botany: all nature is so full, that that district produces the greatest variety which is the most examined'. Local natural history is rather like measuring the length of a coastline; the finer the measure used, the longer it gets. This is

an important point because it draws attention to the educational necessity to choose how and why to shape naturalist experiences. (It is also a reminder that there is no final point at which an educator knows ‘enough’ about the local environment to be certain how to proceed).

Naturalist study of the ‘Selbourne’ kind is not planned in the way a curriculum is usually planned. Each experiential moment offers an infinity of choices as to what to attend to and what to do next. Even a simple walk in the forest may be a mixture of intentions and responses. Nevertheless there are choices to be made, and those choices matter. To see the effect of sheep grazing on native herbs, one must learn to recognise certain herbs and grasses. Moreover, understanding the significance of that loss of vegetation might depend on observations (or other knowledge) to do with the effects on water tables and dry land salinity of changed vegetation structure. Alternatively, the wildflowers on a certain hill may be meaningful to an individual in a quite different way, as: ‘the patch of orchids where we sat that time the storm came in’. Clearly guiding such experiences educationally cannot be easy; nor will it be obvious in what direction they should be guided.

In Australia, history provides a guide for educators. We may not have learned how to live with the land, but we know quite a lot about how not to⁸. Australian environment history has been marked by failures to understand Australian environments, often with ecologically cataclysmic results, but equally by countless small acts of inattention, indifference, and ignorance. I am not suggesting a national manifesto for environmental education. To do so would contradict my contention that local details matter. However, I will suggest some examples which seem apt in Australia, for the sake of illustration, in the form of advice to someone who would plan any form of outdoor environmental education:

1. Concentrate particularly on learning to read the story of environmental changes which have followed European colonisation. For example, it is difficult to describe in a few words how important the categories ‘indigenous’ and ‘exotic’ are to making sense of nature in Australia.
2. Attend carefully to how taken-for granted imported cultural influences (including technologies) shape interests and form habits. For example, the concept of wilderness can make a virtue of disconnection (Brookes, 2001).

⁸ This ‘we’ does not include indigenous Australians, of course. I have not considered the question of indigenous knowledge here because of its complexity. There are no easy answers there.

Important ways of knowing such as hunting have developed around distinctively Australian attitudes to wildlife.

3. Attend carefully to how spatial history has distributed interests and knowledge. For example, that communal knowledge of place or natural history which has developed in Australia has been influenced by a distinction between public and private land, and by issues of transport and distance. Areas such as ski resorts concentrate interest and shape ways of seeing (Brookes, 1998).
4. Know your place before you presume to teach. The implications of this last point warrant a separate discussion; in some respects formal education in Australia is premised on placelessness (Brookes, In press). Closer to home, I suspect few academics would put 'excellent parochial knowledge' on their resumes.

In the area where I live, former gold-seeking and clearing for pasture has left patches of forest along the ridge tops. These forest remnants have been cut several times, and the trees are often coppiced and small. Tree hollows are critical for many of the small mammals and some birds which continue to survive in the forest remnants, and because of the history of cutting tree hollows are scarce. Most of the arboreal mammals are nocturnal, and rarely seen. For most of the local community they don't exist. Structuring a curriculum around learning to 'see' the tree hollows and their occupants is an example of point 1. Because the forest fragments don't fit the aesthetic preference for large tracts of wild country, preferably with water, walking 'routes', views and other features, they have not attracted the attention of the urban-based bushwalkers, who, as a group, have been important in shaping nature conservation in Victoria. Moreover the trees seem scrawny and damaged, the vegetation dry and indistinguishable. Illustrating point 2, the necessity is to structure knowledge of the hollow trees and small mammals into stories which constitute a relationship with the forest. This is not particularly difficult: finding the trees with signs of occupation, waiting silently in the dark for sugar gliders or tuans to emerge, and joining a project to collectively accrue the stories of many of the trees over time introduces some of the elements of natural history 'White' demonstrates. These elements include shaping interests, a growing capacity to make distinctions, not only between species, but between individual trees. They include constructing stories which link knowledge of wildlife with personal experience and attach memories to certain places ('the tree where we saw the seven sugar gliders and spilled the coffee'). They include treating experiences not as episodes, but as part of a relationship, in which knowledge of a place contains memories ('I haven't notice a geebung growing in this area before') and includes expectations of future visits ('Will the tuan still be there?'). Eschewing spotlighting as a 'survey' technique, and instead adopting a more compliant

approach (to borrow Livingston's (1981) term) in which wildlife is encountered more on their own terms is a reminder that technologies are cultural, and are not neutral. Illustrating point 3, it is important to consider how the forest would benefit from the education of particular groups. I teach future guides and educators. They will introduce 'their' trees to a new cohort of students, but will eventually move on. Perhaps it would be best to focus on the families who live adjacent to forest areas, or perhaps the parents of young children. I suspect that the focus should be on local people, but I doubt it should be on school environmental education. Perhaps this brief example, taken overall, illustrates point 4. The particular details of how and why to intervene in the relationships between a community and its place can't be deduced from generalisations about humans alienated from nature. Nor is every local issue simply a manifestation of more general, or global issues.

Of course, to accept that environmental educators should settle in an area (perhaps for years), before teaching, is inconvenient. Similarly, to discuss whether or not schools are the best place for learning natural history may be an irrelevant question for teachers who feel that schools are what they have to work with, or in. Moreover, these comments do not exhaust the problems to which my reading of White seems to have led me. There are three which I will acknowledge briefly.

First, the question of how a rural population, such as the inhabitants of Greater Bendigo, or Selbourne, should know and experience their region is not the typical Australian environmental education problem. The overall Australian problem is more difficult. Most of the small population live in a handful of large cities (of several millions) on the coast⁹. The country is vast, and even making coarse distinctions contains many different kinds of ecosystems. There are profound discrepancies between the spatial distributions of environmental issues, and of political and economic power. Personal knowledge and experience of 'place' for urban dwellers is by no means confined to cities (most people spend time away from cities), but its distribution is complex, largely unmapped, and shaped by influences such as the formation of national parks, the attraction of the coast,

⁹ Settlement of Australia coincided with increasing urbanisation in Britain and America; in Australia there never was a mainly rural population, with experience of the land, gravitating to cities. Australia was urban from the beginning of British colonisation, and by the end of the 19th century Australia was one of the most urban countries in the world, with most of the population living in a small number of state capitals. (Forster, 1995) In contemporary Australia 85% of the population of 18.3 million live in cities, 60% in just 5 capital cities. Moreover, over 4 million of the population were not born in Australia; most immigrants come to capital cities. (Day, 1997; Forster, 1995).

recreational preferences, distance, and the tourism industry. About one in eight vehicles in Australia is a four-wheel drive; the conversation about the possibilities for four wheel driving as a way of knowing (I am serious) has not even begun¹⁰. Far more attention in research and education has been paid to individual episodes of experience, than to the question of how overall patterns of experience form knowledge-constituting relationships. Of course not everything that must be known need be known by personal experience. But representations are always incomplete, or often simply don't exist. While natural science could in principle accrue much of the detailed knowledge which respectful inhabitation of Australia would entail, in practice the task vastly exceeds the likely capacity of the natural sciences in Australia. While amateur natural history has slipped in status over the last two centuries throughout western culture, so has professional natural history (J. A. Secord, 1996). In a country the size of Australia, the gulf between what natural science could achieve, in principle, and what it can achieve, in practice, is immense.

Second, since White wrote 'Selbourne', natural science has been largely professionalised and institutionalised. Especially when approached via formal education (including field trips), nature is encountered through epistemological structures arising from struggles between taxonomists, anatomists, field naturalists, and behaviourists (represented loosely by the museum, the laboratory, the scientific expedition, and the zoo or botanic garden) in the 19th century (Outram, 1996), not to mention subsequent re-orderings around life (as biology), interrelationships (ecology) or evolution (genetics). Ontologically, nature comes to resemble the way it is represented. When a student asks, observing the ice rattling in the leaves of the snow gums and snow frozen on a tent 'how cold is it?' it is clear that cold is not something which is experienced, but measured. The temperature is real in a way the experience of the cold is not. It is this ontological shift which allows wildlife documentaries to seem 'real' and 'Selbourne' to appear unstructured. These ways of ordering understandings are internalised, and, I believe, very difficult to transcend, especially in the context of formal education. But that is not the only reason I have raised them. These shifts have not only altered the structure of knowledge and the sources of authority; they have centralised knowledge, and separated the distribution of knowledge (education) from its production (science). All of this is legitimate and needed – I am not constructing a dichotomy here, but I want to draw attention to importance of building the capacity of communities to *generate* local knowledge.

¹⁰ As the canoe is to Canada's north, the four-wheel drive is to the vast unpopulated reaches of Australia.

Finally, it is important to emphasise how deeply the habit of abstraction is internalised in Western Culture. I have by no means transcended it in this essay, although I hope I sometimes transcend its limitations in my practice. This is not a new observation. Others have made it, including Nabhan, Orr, and Bowers (1993; 1993; 1992). It emerges in tendencies to view behaviour as reflecting consistent attitudes, rather than responses to circumstances (Kagan, 1998; Ross & Nisbett, 1991). It is embedded in the ontological basis of modern social life as the expectation that social relations can and will be dis-embedded from particular contexts and re-embedded in others (Giddens, 1992). It is manifest when the conditions for knowledge production, such as laboratory conditions, emerge in everyday life (Rouse, 1987) – the sugar glider near the climbing tree becomes a specimen, or the mountain becomes a ski resort. The way nature is studied sets the conditions for how it is managed. The way forward in Australia is not to abandon intellectual and cultural traditions. But sometimes it will be necessary to recognise and transcend them. I want to acknowledge how difficult that is. Future environmental educators will need not only deep personal experience of the places where they teach, but also the ability to deconstruct epistemologies and cultural influences, and must understand the history and social construction of science.

It is not fashionable to construct environmental discourse around problems. I can see I have presented a sweeping vista of problems and issues, and some impractical, partial, and difficult, solutions. Gilbert White was an optimist, although his optimism might now be read as hubris. The expectation of a conclusion, preferably a happy ending, is another small part of the cultural inheritance the British brought to Australia. The urge to write an optimistic concluding sentence is strong, but I intend to resist it. The fact is, I have no idea whether the next chapter in the environmental history of Australia will be a happy one, and I am not certain what difference environmental education can ultimately make.

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