



World Views, A Story About how the World Works: Their Significance in the Australian Curriculum: Geography

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'We are all artists and landscape architects, creating order and organising space, time, and causality in accordance with our apperceptions and predilections' (Lowenthal, 1961, p. 260).

Abstract

The Australian Curriculum Cross-curriculum priorities and the Australian Curriculum: Geography both include the term *world views*. The meaning of world views, the development of world views as part of the history of geographic thought, and the adoption world of views by teachers and students, affect the ways in which geography is taught and learned about in the classroom. Particular emphasis is placed on teaching geography as a science, on polarised world views in environmental geography, and on the world views of Indigenous Peoples, particularly Aboriginal and Torres Strait Islander Peoples.

The Way the World Works

The Kogi, who live on the Sierra Nevada de Santa Maria, the coastal mountains in Columbia, call themselves the Elder Brothers of humanity, they are guardians of life on Earth. Their mountains house ancestral spirits kept alive through the work of the *Mamas*, the custodians of Kogi cosmological thought (McLuhan, 1994, p. 363). The *Mamas* are clairvoyant and omniscient. They are masters of the Law of the Mother. When Kogi spoke to British historian, A. Ereira, about gold mining they "see a universe in wrenching labour and they hear the Earth groan" (Ereira, 1992, p.364).

This brief description provides some insight into Kogi ontological world views, their collective beliefs about the nature of reality and being (Olafson, Schraw & Vander Veldt, 2010, p. 244). Ontologies, sometimes called meta-theories, seek to answer the question of what the world must be like for knowledge to be possible (Gregory, 2000, pp. 561–4), a branch of philosophy that studies

the nature of reality or being (Hubbard, Kitchin, Bartley & Fuller, 2005, p. 5).

Dear and Flusty (2002, p. xi) explain that an ontology basically describes someone's world view, or "the principles and assumptions they bring to knowing the world around them". By way of illustration, an atheist and a theist have radically different world views, "totally different assumptions about our being, here on this planet". Jews, Christians and Buddhists share the same world view, or ontology, they are all religious, but their religious persuasions can be likened to different epistemologies or different ways of knowing about the world "while they have already decided that God exists, they have selected different ways to know him/her/it" (Dear & Flusty, 2002, p. xi).

Lockton explores *A Christian worldview of the geographer's world* (1990), although he more accurately examines five major geographical epistemologies, theories of knowledge, assumptions about how we can know the world (Hubbard et al., 2005, p. 5), rather than world views. Lockton examines three of his five approaches: spatial analysis, humanistic geography, and radical geography, but not regional approaches and postmodern geographies, from the perspective of a Seventh-day Adventist and concludes that, at the ontological level "the secular paradigms place humans in a primary position, people are the ultimate source of knowledge, whereas the Christian viewpoint places humans in a secondary position as God is above His created beings" (1990, p. 66).

Another Geographer, Tuan (1974, p. 4) explains the difference between perception, attitude and world views.

Perception is both the response of the senses to external stimuli and purposeful activity in which certain phenomena are clearly registered while others recede in the shade or are blocked out Attitude is primarily a cultural stance, a position one takes vis-à-vis the world.

It has greater stability than perception and is formed of a long succession of perceptions, that is, of experience World view is conceptualised experience. It is partly personal, largely social. It is an attitude or belief system; the word *system* implies that the attitudes and beliefs are structured, however arbitrary the links seem, from an impersonal (objective) standpoint (p. 4).

World view is an ambiguous and elusive term (Kilbourn, 1980–1, p. 3). It is all too difficult to express as an all-embracing concept while concurrently identifying its critical attributes. A more current usage might be *perspectives*. Kleeman (2009, p. 18) explains that “one’s cognitive engagement with the world is determined by the individual’s own perspective and interpretation”. However, more accurately Kleeman refers to an epistemological proposition rather than a world view; but it is easy to conflate the two. Referring to contact history and *terra nullius*, Kleeman advocates classroom strategies that enable students to reflect on and question their own world views (2012, p. 27). The difference between perspectives and world views emerges in the following sentence:

To facilitate this, teachers need to provide students with an opportunity to analyse their values and those of others, to identify how their own perspective, and those of family and peers, is shaped by external influences, and how in turn, these are shaped by the way contact history has been portrayed, particularly by the media (p. 27).

World views are holistic but they should be open to interpretation.

Norton’s (1991, p. 75) definition of world view sharpens the focus more clearly. He refers to “the constellation of beliefs, values, and concepts that give shape and meaning to the world a person experiences and acts within”. Capra (1986, p. 11) adds that world views are shared by a community to the extent that such views provide a basis for the ways a community organises itself. Kleeman’s notion of assemblage of outlooks is extended here in that a sharing of understandings is implicit in a world view. Again, this is implied in the German word for *world outlook*, or, *Weltanschauung* that is sometimes used as a synonym for world view. It can be thought of as the deep, enduring cultural patterns of a people (Heibert, 2008, p. 14). Referring to worldwide perception, *Weltanschauung* (Welt- ‘world’ + *Anschauung* -view or *outlook*) also refers to the nature of the world, particularly as containing or implying a system of value principles (Feagin, 1993, p. 40).

Sterling expresses the term world view more directly as a story about the way the world works (2003, p. 33). Collingwood does so more exactly when he points to persons and cultures guided by sets of *ultimate presuppositions* (2002, p. 194) — beliefs that take precedence over other views.

Geographical World Views

In human geography, a number of competing world views, with very different ontologies and incommensurable conceptions of geography as social science, jostle about in academic circles. To further compound this state of affairs in a postmodern world, “Any strongly held worldview, based on clearly defined truth claims, has been regarded with growing scepticism” (Gold, 2002, p. 224). Nevertheless, geographers working in the social sciences and the humanities have identified a number of possible world views that can be applied across the disciplinary boundaries.

By way of contrast, in physical geography most geographers work within an empirical context focusing largely on the philosophies that engage natural scientists. Castree (2005, p. 204) alludes to stereotypical gumboot wearing physical geographers as empiricists. This may well be something of an exaggeration? Nevertheless, what is alluded to here is an epistemological world view, an individual’s collective beliefs, about the nature and composition of knowledge (Olafson et al., 2010, p. 244) an epistemological stance that, in this case, often rests on logical positivism (Peet, 1998, p. 25).

Trudgill and Roy (2003) demonstrate that more holistic approaches to landscape, that involve problem solving approaches and collaboration with human geographers and other social scientists, have emerged in recent years (Renwick, 2005, 610). Moreover, it is apparent that there is no single scientific method that can be applied in a straightforward manner by physical geographers (Inkpen, 2005, pp. 27–36; Castree, 2005, pp. 204–8). To complicate matters still further, studies from school science classrooms demonstrate that a number of different ontological and epistemological world views coexist emanating from both teachers and students (Cobern, 1991, 1996; Proper, Widden & Ivany, 1988). Ultimate presuppositions are disordered, deep learning becomes problematic and intellectual progress is obstructed when there are under-theorised assumptions about knowledge and reality.

In environmental geography, the schism between the world views of egocentrics as opposed to ecocentrics has resulted in lively academic exchanges. A rather stereotypical view suggests that a postmodernist world view sees the

biosphere as ecocentric whereas a modernist world is constructed around an irredeemably anthropocentric planet (Bordessa, 1993, p. 150). Again these are completely radical alternatives of how the world can be construed in ontological and epistemological terms. These ideas will be examined in the section below . . . *Environmental geography's world views*.

In human geography, a watershed in world views has been identified in the publication of David Harvey's (1973) *Social justice and the city* (cited in Chalmers, Keown & Kent, 2002, p. 315), when Harvey switched from an orientation towards spatial science to social theory. Harvey is also complicit in another manifestation of this watershed when he revealed that, in 1974, "something called 'postmodernism' emerged from its chrysalis" (Harvey, 1990, p. 3). Some academic geographers maintain that there are two salient world views: spatial science and social theory; others identify empiricism, positivism and modernist social theory with the latter triumphant and the "others relegated to the dustbin of geographical history" (Duncan & Barnes, 1993, p. 248).

A. Maude (personal communication, 2013) argues that geographers have lost some useful insights as a consequence of the wholesale rejection of earlier phases of geographical thinking. On the other hand, Cresswell (2013, p. 15) points to the plethora of books about geographical theory that has proliferated in the last few decades. We must learn from the past, embrace the eclecticism that is revealed in geography's history, but also be cognisant of the intellectual tumult that was apparent in the early 1970s and its impact on the formation of contemporary geographic world views.

Harvey referred to the ferment of ideas that swirled around the academy twenty years ago.

Last year it was positivism and Marxism, this year structurationism, next year realism and the year after that constructivism, postmodernism or whatever. It is easier to keep pace with the changes in Benetton's colours than to follow the gyrations of ephemeral ideas now being turned over within the academic world (Harvey, 1996, p. 461).

Gregory (1994) presents a collage of ideas, from various postmodern authors, that express the *zeitgeist* of this tumult,

. . . space is dissolved into flows," "cities become shadows," (Castells, 1983, p. 314) and places are emptied of their local meanings; and that ever-extending areas of social life are being wired into a vast

postmodern hyperspace, an electronic inscription of the cultural logic of late capitalism, whose putative abolition of distance renders us all but incapable of comprehending – of mapping – the decentred communication networks whose global webs enmesh our daily lives (p. 98).

Gregory had presaged a change to social theory as the dominant world view in human geography in 1978, with *Ideology, science and human geography*, when he powerfully linked social theory with human geography, "a conjoining that went on to become a dominant focus in the discipline for the remainder of the twentieth century" (Dear & Flusty, 2002, p. 95).

Concurrently, geographers were developing humanistic geographies (Ley & Samuels, 1978) that added to the waves of thinking that fervently rejected spatial science and more structural forms of social theory, such as Marxism. Humanistic geography bloomed and then shrank on the vine to be replaced with a more robust *cultural turn*, a move that enriched social theory through geography's deeper engagement with the humanities in the twenty-first century.

Buttimer and Pepper

Buttimer (1993) delved more deeply into geography's world views by drawing on Pepper (1966) to restate root metaphors or world views that underpin geographical practice. Each ontological world view projects a distinctive interpretation of reality.

The world views are

- the world as a mosaic of patterns and forms is the metaphor that informs geography's chorological tradition, that studies the relationships between phenomena that occur in the same place (Holt-Jensen, 2009, p. 214); the map presents an assortment of patterns and forms and their forms are open to explanation as, for example, in the formation of beach cusps or the oscillation of the demographic transition model (Buttimer, 1993, p. 22);
- the world as a mechanism of causally interacting systems, best seen in geography's spatial systems approach as illustrated by urban-rural and pull/push models, or cascading hydrological systems;
- the world as an organism, an holistic view emphasising unity in diversity, a view that is shared by environmental geographers of the ecocentric rather than egocentric persuasion (Merchant, 1992);
- the world as arena, "the stage on which spontaneous and possibly unique events

occur” (Buttimer, 1993, p. 23); the geographer becomes a participant rather than observer; “reality became interpreted as an arena of events, or mirrors and masks, of texts and reflecting contexts” (p. 201).

Johnston and Sidaway (2004, p. 403) add a fifth root metaphor, i.e. “the world as text, in which the landscape is a means of understanding its creator’s intentions and cultures”. However, the world as arena probably subsumes the *world as text*.

Buttimer (1993, p. 202) refers to Jackson’s ideas about paying attention to the vernacular, the work-a-day world as text:

The motel, the franchised fast-food shop, and the contemporary American house seeking to accommodate new mobile and recreational lifestyles are as authentic examples of what vernacular means as the dwelling of Pueblo Indian or Greek peasant (Jackson, 1976, p. 19)

Nevertheless, if this fifth root metaphor better admits the cosmologies of Aboriginal and Torres Strait Islander Peoples (Waite, McGuirk, Dunn, & Burnley, 2000, p. 166) then it is a welcome addition.

One could argue that the physical geographer is more likely to practise the first two of Buttimer’s root metaphors but their teaching, and indeed their life outside the laboratory/classroom, may well be influenced by all or more of these world views. It is more than conceivable that physical geographers working in environmental geography would embrace most, if not all, these world views. Cultural geographers are more likely to start from the world as organism, arena or text but are also open to the two ontological world views that Pepper (1966) regarded as inadequate because they lack precision in dealing with individual facts and in their scope of factual corroboration (p. 118). They are animism with the human being, the person as its root metaphor, and, mysticism where the root metaphor is the “common emotion of love” (p. 133). Geography teaching that includes the world views of Aboriginal and Torres Strait Islanders Peoples should also be cognisant of these two *inadequate* ontological world views.

Teaching Geography: Which World Views?

Peters’ notion that “to be educated is not to have arrived; it is to travel with a different view” (Peters, 1967, p. 8) is made even more explicit because “to be educated is to have one’s view of the world transformed by the development and systematization of conceptual schemes” (1975, p. 256).

Such education takes place with teachers with differing epistemological world views, “a set of beliefs that collectively define one’s attitudes about the nature and acquisition of knowledge” (Olafson et al., 2010, p. 244). Firstly, different epistemological outlooks result in different forms of teaching and assessment practices (Schraw & Olafson, 2002). Generally, teachers with a mechanistic world view often tend to be teacher-centred, relying on lectures, concrete examples, rules and little student participation whereas teachers endorsing a world as arena or world as organism view generally adopt a student-centred approach (Schraw & Olafson, 2002). Secondly, the ontology of a teacher, the ‘who’ that is teaching (Field & Latta, 2001), “the complex and uncertain gathering of energies, words, gestures, commitments, affections, artefacts, bodily feelings, routines and habits”, as Mulcahy (2012, p. 22) puts it, affect the individual’s way of being a teacher. This teacher self adopts particular teaching practices that are affected by the ontology of the teacher.

A teacher that tends to see the world as a mechanism of causally interacting systems, an ontological realist, assumes one underlying reality that is the same for everyone (Olafson et al., 2010, p. 249), therefore the same type of didactic teaching and learning is appropriate for all. Whereas teachers with a world as arena (contextualist) world view “are not only concerned with the type of knowledge that students construct, but with the process that they use to construct that knowledge” (p. 250).

Finally, there is some evidence that different teacher ontological and epistemological world views lead to differences in achievement among students. Staub and Stern (2002) found that teachers with a contextualised, world as arena perspective, were better able to help school children’s mathematical skills than teachers who endorsed direct transmission, an understanding underpinned by a mechanistic world view.

Teaching Geography as Science

Coburn, (1996, p. 584) argues that rather than refer to a scientific world view it would be better to refer to a metaphysics for science, a scientific outlook, an endeavour to enable students to see the world scientifically – where only scientific knowledge is true knowledge. The underlying assumption is that students can be taught to adopt this outlook. However, students frequently see a mismatch between school scientific knowledge and the common sense knowledge they adopt outside the school walls.

Once the pressure is relieved (e.g., the exam is over) the walls go and the concepts revert to forms more consistent with the students' world view or simply deteriorate for lack of significance (Cobern, 1996, p. 588).

These arguments have obvious relevance for the teaching of the physical geography strands in the Australian Curriculum: Geography.

Cobern contrasts two ontological world views of nature, the biophysical environment. A very able Year 9 science student, interviewed by Cobern an academic from Western Michigan University, essentially based her conceptualisation of the natural world on aesthetic and religious elements but her teacher saw nature as orderly and understandable. The student was alienated from the teacher's conception of scientific learning because it conflicted with her sense of wonder about the world. Her teacher dealt with an environment in which there is located a collection of resources for knowing, understanding and reasoning (1996, p. 600). The student saw the world as an organism, a text, in mysticism and drew from animism in her assumption that physical forces of nature have a motivating force (Kilbourn, 1980-1, p. 5); the teacher saw the world as a mechanism of causally interacting systems. His was an evidence-based world.

Clearly, the messy business of teaching and learning is more complicated than this. "Aboriginal people explained their environment, and their integral relationships with it, in spiritual terms, but they were meticulously empirical and evidence based in their observation and management of that environment" (A. Maude, 2013, personal communication). Moreover, an analysis of the ontological world view that science teachers projected in their classrooms found that an individual teacher will at times use explanations corresponding to more than one of Pepper's four root metaphors (Proper, Widden & Ivany, 1988, p. 554). Form and mechanism were most important in physics and chemistry lessons but all four metaphors were apparent in biology (Kilbourn, 1980-1, p. 7) and earth science lessons. Further, an individual teacher at times projected each of the different worldviews (Cobern, 1991, p. 8).

The current controversy over creationism and evolution that is apparent in science classrooms, particularly in North America, can be traced to an embrace of animism, "one identifying characteristic of which is a theory of truth based on infallible authority [the Bible]" (Kilbourn, 1980-1, p. 5) and the evolutionists' acceptance of mechanism, an evidential world view.

Environmental Geography's World Views

"The attainment of a value-free and neutral methodology and language for geography is impossible" (Morgan & Lambert, 2005, p. 104).

O'Riordan stated that environmentalism involves the clash of two world views (1990, p. 143) choosing the terms *technocentrism* and *ecocentrism* to describe these epistemological modes of thinking (Merchant, 1992, used the terms egocentric and ecocentric).

The first, "technocentric or egocentric", is a human-centred (anthropocentric) view of the environment, giving rise to a manipulative, managerial or interventionist approach to resource use and environmental protection. The other orientation is "ecocentric" and is based on an holistic nature/Earth centred view of the world which gives rise to a nurturing approach (Sterling, 2003, p. 412).

The former epistemological world view is often regarded as the dominant social paradigm (Feagin, 1993, p. 42) while ecocentrism is more radical and is associated with non-government organisations and green politics arguing for a fundamental alteration in existing economic and social uses of nature (Castree, 2000, p. 221).

Bayliss-Smith and Owens (1994, 120) regard ecocentrism as part of a much more complex epistemological world view not restricted to environmental issues but supportive of many of the non-material objectives of the trade union movement and typical of middle class people employed in the service sector. Thus, middle class geography teachers addressing rural students about environmental issues may well experience a fundamental and irreconcilable clash of world views. On the other hand, when Maude (2013, personal communication) asked his first year university geography students a series of paired questions in an attempt to ascertain their environmental world views, the results were inconclusive. Students held an assortment of epistemological world views from the ecocentric to the technocentric/anthropocentric, with a marked skew towards ecocentric world views.

In ontological terms, the great debate in environmental geography revolves around a transition from a mechanistic world view, where it is assumed that explanation of phenomena can be reduced to the interactions among discrete particles, which are real by virtue of specific location in time and space (Kilbourn, 1980-1, p. 6; Pepper, 1966, pp. 186–231), towards the world as an organism, whereby successive degrees of truth culminate in absolute truth found in the organic whole (Kilbourn, 1980-1; Pepper, 1966, pp. 280–

314). More insistently, Capra (1996, p. 17) states, "The basic tension is one between the parts and the whole. The emphasis on the parts has been called mechanistic, reductionist or atomistic; the emphasis on the whole holistic, organismic, or ecological".

In fact, this may be regarded as a return to an earlier ontological world view. Modernity signalled a break from

traditional world views that emphasised the interconnectedness of all living and non-living things, the importance of divine will and provenance, and the virtue of things remaining the same. Greek and renaissance Europe regarded the cosmos as a living organism with a nurturing female earth at its centre. Such organic world views generate respect for nature and contain much traditional and local wisdom that serves to limit its non-sustainable uses (Huckle, 1996, p. 5).

Sterling explains that a fundamental shift in world view in Europe took place between around 1500 and 1700 away from the relatively ordered world of medieval Christendom, to (what historians later called) the Scientific Revolution (Sterling, 2003, pp. 141–2). Clearly, there are also traces of animism and mysticism in Greek and renaissance Europe but, for most of the past three hundred years, a mechanistic and scientific ontological and epistemological world view has predominated "which sees the earth as dead and nature as a machine that can be transformed, improved and managed in the human interest" (Huckle, 1996, p. 5).

A subsequent change from a powerful ethic empowered by mechanistic and reductionist science to an organic ontological world view based on "interconnectedness, process and open systems" (Merchant, 1994, p. 17) has been difficult to accept by many proponents of rationality and scientific reason. "So powerful is the mystique of reason as instrument in the control of nature and human bodies that it banishes other modes of participating in the world to the periphery of society" (Merchant 1994, p. 4).

A shift towards the world as organism is a very significant *turning point* for people and societies imbued with a mechanistic world view (Capra, 1982). And the world as organism ontological world view inclines towards much more complicated systems thinking. Meadows (1982, p. 101) states: "The world is a complex, interconnected, finite, ecological-social-psychological-economic system. We treat it as if it were not, as if it were divisible, separable, simple, and infinite. Our persistent, intractable, global problems arise directly from this mismatch".

Psychologist, Heron (1992, p. 251) explains,

Today, a significant minority have abandoned the Newtonian-Cartesian belief system in favour of some elaboration of a systems theory worldview. But it may be that they, and certainly the majority of people, still see the world in Newtonian-Cartesian terms. It is a big shift for concepts to move from being simply beliefs held in the mind to beliefs that inform and transform the very act of perception.

Some would go further. Bateson suggests that most of us are governed by epistemologies that we know to be wrong (1972, p. 461). Keeney discussed the difficulties involved in affecting an epistemological change of views because, "A change in epistemology means transforming one's way of experiencing the world" (1983, p. 7). Sterling (1993, p. 72) maintains that the case against the dominant mechanistic world view is that it no longer constitutes an adequate model of reality—particularly ecological reality.

Clearly, this recent shift in ontological and epistemological world views is an awe-inspiring one, "as profound as any paradigm shift in the history of science" (Davies & Gribbin 1992, p. 230). Furthermore, Sterling (2003, p. 36) implies that such a participatory world view can lead to an embrace of animism and mysticism whereby "meaning and mystery are restored to human experience, so that the world is again experienced as a sacred place" (Reason 1994, p. 10). As Huckle observed, "Newtonian science eliminated concepts of hierarchy, value, purpose, harmony, quality and form from older organic descriptions of nature, leaving only matter and force" (1996, p. 5).

Aboriginal Cosmologies

Geography first embraced Aboriginal and Torres Strait Islander cosmologies through humanistic geography. "Cosmology is a term applied to holistic views regarding the origins of the universe, the earth and place of self, people and the earth's environment in the universe" (Waitt et al., 2000, p. 166). Tuan refers a conception of space wherein people experience topophilia, "the affective bond between people and place or setting" (1974, p. 4), leaving room for the ontological world views of animism and mysticism.

Kohen (1995) begins the second chapter of his book on Aboriginal environmental impacts by reference to the foundations of his world view. He clarifies that he was brought up in a Eurocentric, Christian society and trained as a scientist. It is

his right, within an egalitarian society, to hold to a particular world view.

In the same way Aboriginal people have a right to maintain their culturally and socially determined beliefs, one of which deals with their origins and creation. Indeed, it may be said that the belief in the Dreaming extends far beyond an explanation of their origins and existence of everything in the world, everything in the past and everything in the future (Kohen, 1995, p. 9).

Silas Roberts, first Chairman of the Northern Land Council, stated

Aboriginals have a special connection with everything that is natural. Aboriginals see themselves as part of nature. We see all things natural as part of us. All the things on Earth we see as part human. This is told through the ideas of Dreaming. By Dreaming we mean the belief that long ago, these creatures started human society. These creatures, these great creatures are just as much alive today as they were in the beginning. They are everlasting and will never die. They are always part of the land and nature as we are. Our connection to all things natural is spiritual (Rose, 1996, p. 26, quoting Neidjie, Davis, & Fox, 1985, p. 13).

The immediate impression is the fusion of spirituality with the world as organism view. There is a powerful sense of interconnection. Kombumerri woman Mary Graham explains:

Although Indigenous people everywhere are westernised to different degrees, Aboriginal people's identity is essentially always embedded in land and defined by their relationships to it and to other people. The sacred web of connections includes not only kinship relations and relations to the land, but also relations to nature and all living things (Graham, 1999, p. 112).

Jugan-Yawuru woman, Pat Mamanyjun Torres, recalls the lessons of her childhood:

This extensive array of knowledge that was linked to land, people, the cosmos, and our spirituality, was taught to us on a daily basis by our kinfolk and reinforced on our land whenever we passed sites of significance or animals, plants and people with which we were interrelated. Each season meant new experiences linked to new knowledge-building and our increasing age gave us access to increased levels of complexity of knowledge.

Ritualised ceremonial activities were followed by my family while they were still being practiced in the Broome region. I remember being taken by my mimi to one of the last Yawuru ceremonies on the edge of the Dampier Creek floodplains near Rinjamarn Burru, not far from Garnin, and its effect on instilling great respect in me for our Indigenous cultures and my experiencing its amazing psychic energies to dream and receive visions (Torres, 2006, p. 25).

There are many different Aboriginal and Torres Strait Islander ontological world views but it is appropriate to conclude that Aboriginal world views tend towards the holistic rather than the mechanistic. Typically, Aboriginal people examine elements of their surroundings in terms of how they relate to each other (Fleer, 1999, p. 122). In the Ngujakura, the Dreaming of Yalinji People, a past and present state, ancestral beings made the country and left stories that define Aboriginal Law. Alma Kerry, a Yalinji elder shares this fire story:

In the beginning, at Buru, Kija the moon had started a fire. Dabu are those little bees that make wild honey in the rainforest. Dabu didn't want the fire to spread out. That fire was too hot, they were frightened Kadar the wallaby would burn his feet. Dabu cut some branches and leaves to put out the fire, by beating on it. Dabu was singing out "don't make too much fire". But the fire didn't stop. So he ran away from the fire, he flew away and ended up near the mangroves down there. There's yirmbal, a spirit now at the place where Dabu went. No-one can go near it or touch it. You're not to go near the mangroves, or eat anything from that area, shell, mussel, or walk around there (Hill et al., 2004, p. 53).

Aboriginal ontological world views involve spiritual, mythic and totemic aspects but they are also rational and subjective views (Waitt et al., 2000, p. 167). Graham explains that Aboriginal Law can be seen as both a science and a religion (1999, p. 115). It can be seen to embrace all six of the world views identified by Pepper except, perhaps, mechanism, where the entire universe is like a machine. Graham explains, "It is a religion in that it explains both the origins and meaning of the cosmos (including the observer), and it is a science in that it does so rationally, and with empirical support" (1999, p. 115). When a teacher adopts a somewhat mechanistic world view, "in which human appetites and weaknesses are out of the picture" (Christie, 1991, p. 27), to teach Aboriginal children, the consequences can be somewhat unpredictable. A non-Aboriginal

teacher was teaching a science unit on living things, wrote the word *bird* on the blackboard and asked the students to brainstorm their responses. They responded with stings, eggs on leaf and buzzing. The Anindilyakwa term wurrajija is often loosely translated as bird but the term actually refers to any kind of flying animal, including birds, bats and insects (Fleer, 1999, p. 127). The students were responding rationally and providing empirical support for their responses. Their response was ecologically based and contextualised; their response exemplified a world as arena view.

Christie and Perrett (1996, pp. 60–61) describe a community research project conducted by Yolngu teacher education students at Yirrkala. Two of the trainees acted out the nature and origin of their Yolngu languages for the benefit of school students and Balanda (non-Aboriginal teachers). They referred to sites and totems in their territory and spoke of likan and bundurr, literally referring to the words for elbow and knee but metaphorically referring to the linkages within a Yolngu epistemological world view.

They are what keep the Yolngu cultural “body” moving. They can be understood as naming the connecting and articulating points within the complex web of relatedness in which stands every individual, group, totem, song, plant, animal and piece of land, and into which everything is born (1996, p. 61).

The existence of the world as organism is clear in many of the extracts above but so too is the world as arena. There is much emphasis on an act in its context; there is much emphasis on personal involvement and learning in the real world; there is much action involved in collecting bush tucker, the meetings of elders and the conduct of ceremonies.

Consider the personal geographies of this young person:

It’s dry season in the Maningrida region and a young Djinang girl listens to her aunty as they hunt for long-necked turtles at the swamp’s edge. She looks down as aunty explains how the angle of the sun and a tell tale mark in the mud reveals the turtle’s breathing hole. “All the while her aunty sang softly. I later learned she was teaching the girl a song-line for the area” (Fogarty, 2012, p. 89). Rock paintings and ceremonial stories indicate that Aboriginal people in the Maningrida region have been harvesting northern long-necked turtles for many generations. The young girl is

developing her personal geography as she “learns through country” (Hutchinson, 2013).

All the discussion so far has tended to stress the four ontological world views that Pepper maintains are evidence based. Mysticism, whether seen in Pepper’s work or subsumed in Johnston and Sidaway’s (2004, p. 403) world as text ontological world view, is a relevant perspective for many Aboriginal people. Here truth is revealed in mystical experiences which are immediate, totally uninterpreted, certain, and emotionally ecstatic (Kilbourn, 1980-1). Yuin elder, Max Dulumunmun Harrison speaks of Sydney red gums, *Angophora costata*,

Angophoras, they are old female trees. If you look at a tribe of angophoras that’s sprouted out from some rocks you will see they are so huge and how they twist and turn and are embracing everything. Once you start looking at those old grannies as we call them, then you know “Whoa, there’s a women’s place somewhere about here”, because they are used as a signpost’ (Harrison, 2009, p. 141).

Animism assumes that physical aspects of nature have a motivating force similar to that perceived by humanity but truth in animism is “ultimately determined by the absolute authority of the spirit or its designate often in the form of holy books” (Kilbourn, 1980-1, p. 5). In its former conceptualisation, animism can be identified in the world views of many Aboriginal people. Most often spirituality is expressed in the land: “. . . every rock and every landform, every plant and every animal had its own consciousness, just as people did. Everything was ‘alive’ ” (Sveiby & Skuthorpe, 2006, p. 4).

Bill Neidjie, a Gagadju elder, explained how the stories passed on in an oral tradition are linked to the welfare of the land:

The stories and the land go together. If the land stays the stories stay, if you give ‘em story all the time. But if story he go, because he got spirit with him, dead, dead people, like spirit he’ll go, and story goes down, down. You know, the land he couldn’t be worse (Williams, 2006, p. 130).

Animism can be seen in the acceptance of totems:

What is meant by Totemism in Aboriginal Australia is always a mystical connection, expressed by symbolic devices and maintained by rules, between living persons, whether as individuals or as

groups or as stocks, and other existents~ their “totems”~ within an ontology of life that in Aboriginal understanding depends for order and continuity on maintaining the identities and associations which exemplify the connection (Stanner, 1979, pp. 127–8).

Tex Skuthope, a Nhunggabarra painter and storyteller, is of the sand goanna totem, which is made up of all sand goanna totem people of Australia.

The Nhunggabarra of all totems had to maintain and improve the habitats of all the plants that the animals fed from. They learned this by observing animal behaviours from a young age. Knowledge and rules of behaviour were also embedded in stories, dances and ceremonies (Sveiby & Skuthorpe, 2006, p. 11).

Lisa Buxton, a Munaljahi woman, and co-author of *Guyunggu . . . An Aboriginal Way of Being, Teachers’ Notes* presents the *Rhythms of the land* for teachers of primary students:

Aboriginal people, in connecting to the land in their particular “country”, learn the different rhythms that exist at different times of the year. On a surface level, these rhythms show themselves through food seasons, when plants flower and produce their fruit. In understanding the connections between every living thing, Aboriginal people know that certain fish will be running along the coast in their area when a certain plant flowers in the mountains. This understanding means people travel their country to the rhythms of the land.

On deeper levels, it is also known that certain ceremonies and rituals are to be performed at various times of the year to help keep the country vital and healthy and in doing so, help keep everything in balance: Land, People and Spirit (Edwards & Buxton, 1998, p. 92).

Here we have a crux of an Aboriginal ontological world view: Land, People and Spirit, three interconnected strands that resonate with personal geographies, empirical realities, and mythical space and place.

What Kinds of World Views are Alluded to in the Australian Curriculum: Geography?

An holistic world as organism view is explicit in the Aboriginal and Torres Strait Islander cross-

curriculum priority with the world as text view implicit in this statement:

Aboriginal and Torres Strait Islander communities are strong, rich and diverse. Aboriginal and Torres Strait Islander Identity is central to this priority and is intrinsically linked to living, learning Aboriginal and Torres Strait Islander communities, deep knowledge traditions and holistic world view (ACARA, *n.d.* a).

The sustainability cross-curriculum priority appears to adopt a plethora of world views in the following:

Education for sustainability develops the knowledge, skills, values and world views necessary for people to act in ways that contribute to more sustainable patterns of living. It enables individuals and communities to reflect on ways of interpreting and engaging with the world (ACARA, *n.d.* b).

The world as organism is implicit in this statement: “World views that recognise the dependence of living things on healthy ecosystems, and value diversity and social justice are essential for achieving sustainability” (ACARA, *n.d.b.*).

Scale and commitment are implicit here but no specific world view is signalled: World views are formed by experiences at personal, local, national and global levels, and are linked to individual and community actions for sustainability’ (ACARA, *n.d.b.*).

The curriculum certainly encourages an engagement with world views and tends to favour the world as organism although the other three – the world as a mosaic of patterns and forms, the world as a mechanism and the world as an arena – of Pepper’s world views are integral to the subject. The world as text, animism and mysticism are not prominent:

Geography enables students to develop an holistic understanding of human dependence on the environment. It provides opportunities for students to integrate their study of biophysical processes with investigations of the attitudinal, demographic, social, economic and political influences on human use and management of the environment. It enables students to explore how world-views influence these relationships and interactions with the environment (ACARA, 2012).

In Year 6, a content descriptor requires students to learn about “The world’s cultural diversity,

including the diversity of the world's Indigenous Peoples" and an elaboration suggests that students "investigate world views, environmental practices and connection to land of Indigenous Peoples globally" (ACARA, 2012). Here is a direct invitation to engage with the world views associated with Indigenous Peoples.

In Year 10, a content descriptor requires students to learn about "The environmental world views of people and their implications for environmental management" and an elaboration suggests that students reach an "understanding of the role of people's environmental world views, such as human-centred and earth-centred, in producing different attitudes towards environmental protection" (ACARA, 2012). There is a direct invitation to engage with the world views of environmental geographers.

In Year 10, a content descriptor requires students to learn about "The application of human-environment systems thinking to the causes, consequences and solutions of the environmental change being investigated" and an elaboration suggests that students could be "reflecting on the influence of people's environmental world views on their attitudes to environmental issues and programs" (ACARA, 2012). Another invitation to engage with the world views of environmental geographers.

Conclusion

Galarrwuy Yunupingu, Aboriginal leader and the former chairman of the Northern Land Council asserted:

We want our ceremonies, we want our language, we want our stories told to our children, we want to sing, we want to dance. And why do we do it? We want to talk to our land and the land talk to us (Davis, Muecke, Narogin, & Shoemaker, 1990, p. 338).

I look to a geography enriched by an investigation of world views. I would like geography teachers and students to study such Authority. (n.d.a) an appropriate aspect of people's lives: a spatial take on place, environment, interconnectedness, beliefs and cosmologies. I am convinced that evaluations of world views should be drawn from deep engagement with the history of geographic thought. I favour world views that tend to be nature-centric and holistic but acknowledge that these ends can be arrived at through evidence-based reasoning. I believe that world views should encompass those of Indigenous People, particularly Aboriginal and Torres Strait Islander Peoples. I strive to see at last that, "Every image and idea about the world is compounded, then, of personal experience, learning, imagination, and

memory" (Lowenthal, 1961, p. 260) and trust that an examination of world views will enrich teaching and facilitate learning about the Australian Curriculum: Geography.

References

- Australian Curriculum, Assessment and Reporting Authority. (n.d. a). *Australian Curriculum, cross-curriculum priorities, Aboriginal and Torres Strait Islander histories and cultures*. Retrieved from <http://www.australiancurriculum.edu.au/CrossCurriculumPriorities/Aboriginal-and-Torres-Strait-Islander-histories-and-cultures>
- Australian Curriculum, Assessment and Reporting Authority (n.d. b). *Australian Curriculum, cross-curriculum priorities, sustainability*. Retrieved from <http://www.australiancurriculum.edu.au/CrossCurriculumPriorities/Sustainability>
- Australian Curriculum, Assessment and Reporting Authority (2012). *Revised draft F-10 Australian Curriculum: Geography*. Sydney: ACARA
- Bateson, G. (1972). *Steps to an ecology of mind*. San Francisco: Chandler.
- Bayliss-Smith, T., & Owens, S. (1994). The Environmental challenge. In D. Gregory, R. Martin, & G. Smith (Eds.), *Human geography: Society, space and social science*. Minneapolis: University of Minnesota Press.
- Bordessa, R. (1993). Geography, postmodernism, and environmental concern. *Canadian Geographer/Le Géographe canadien* 37, 147-156.
- Buttimer, A. (1993). *Geography and the human spirit*. Baltimore: The John Hopkins Press.
- Capra, F. (1982). *The turning point*. London: Flamingo.
- Capra, F. (1986). The concept of paradigm and paradigm shift *Re-Vision*, 9,1.
- Capra, F. (1996). *The Web of life*. New York: Anchor.
- Castells, M. (1983). *The city and the grassroots: A cross cultural theory of urban social movements*. Berkeley: University of California Press.
- Castree, N. (2000). Environmental movement. In R. Johnston, D. Gregory, G. Pratt, & M. Watts (Eds.) (4th ed.). *The dictionary of human geography*. Oxford: Blackwell.
- Castree, N. (2005). *Nature*. London: Routledge.
- Chalmers, L., Keown, P., & Kent, A. (2002). Exploring different perspectives in secondary geography: professional development options.

International Research in Geographical and Environmental Education, 11, 313–324.

- Christie, M., & Perrett, B. (1996). Negotiating resources: language, knowledge and the search for 'secret English' in northeast Arnhem Land. In R. Howitt & J. Connell (Eds.), *Resources, nations, and indigenous peoples*. Melbourne: Oxford University Press.
- Christie, M. J. (1991). Aboriginal science for the ecologically sustainable future. *Australian Science Teachers' Journal*, 37, 26–31.
- Cobern, W. (1991). World view theory and science education research. *NARST Monograph No. 3*. Manhattan, KS: National Association for Research in Science Teaching.
- Cobern, W. (1996). Worldview theory and conceptual change in science education. *Science Education*, 80, 579–610.
- Collingwood, R. (2002). Rex Martin. Ed. An essay on metaphysics (Revised Edition). Oxford: Clarendon Press.
- Cresswell, T. (2013). *Geographic thought: a critical introduction*. Chichester: Wiley-Blackwell.
- Davies, P., & Gribbin, J. (1992). *The matter myth: Beyond chaos and complexity*. London: Penguin Books.
- Davis, J., Muecke, S., Narogin, M., & Shoemaker, A. (Eds.). (1990). *Paperbark: a collection of black Australian writings*. St Lucia: University of Queensland Press.
- Dear, M., & Flusty, S. (Eds.). (2002). *The spaces of postmodernity: readings in human geography*. Oxford: Blackwell.
- Duncan, J., & Barnes, T. (1993). Afterword. In T. Barnes & J. Duncan (Eds.), *Writing worlds, discourse, text and metaphor in the representation of landscape* (pp. 248–253). London: Routledge.
- Edwards, C., & Buxton, L. (1998). *Guyunggu ... An Aboriginal way of being, teacher's notes*. Waitara: Catholic Schools Office Diocese of Broken Bay.
- Erira, A. (1992). *The Elder Brothers: A Lost South American People and their message about the Fate of the Earth*. New York: Alfred A. Knopf.
- Feagan, R. (1993). *Interpretations of sustainability: worldviews of environmental activists with the Save Georgia Strait Alliance of British Columbia*. Thesis submitted in partial fulfilment of the requirements of the degree of Doctor of Philosophy, in the Department of Geography, Simon Fraser University. Retrieved from <http://summit.sfu.ca/system/files/iritems1/5717/b15248367.pdf>
- Field, J., & Latta, M. (2001). What constitutes becoming experienced in teaching and learning? *Teaching and Teacher Education*, 17, 885–895.
- Fleer, M., (1999). Children's alternative views: alternative to what? *International Journal of Science Education*, 21, 119–135.
- Fogarty, B. (2012). Country as classroom. In J. Altman & S. Kerins (Eds.), *People on country: vital landscapes, indigenous futures* (pp. 162–173). Sydney: The Federation Press.
- Gold, L. (2002). Positionality, worldview and geographical research: A personal account of a research journey. *Ethics, Place & Environment: A Journal of Philosophy & Geography*, 5, 223–237.
- Graham, M. (1999). Some thoughts about the philosophical underpinnings of Aboriginal worldviews. *Worldviews: Environment, Culture, Religion*, 3, 105–118.
- Gregory, D. (1994). *Geographical imaginations*. Cambridge, MA: Blackwell.
- Gregory, D. (2000). Ontology. In R. Johnston, D. Gregory, G. Pratt, & M. Watts (Eds.), *The Dictionary of Human Geography* (4th ed.), Oxford: Blackwell.
- Harrison, M. (2009). *My people's dreaming: An Aboriginal elder speaks on life, spirit and forgiveness*. Sydney: Finch.
- Harvey, D. (1973). *Social justice and the city*. London: Edward Arnold.
- Harvey, D. (1990). *The condition of postmodernity*. Oxford: Blackwell.
- Harvey, D. (1996). Between Space and Time: reflections on the Geographical Imagination. In S. Daniels & R. Lee, (Eds.), *Exploring human geography: A reader*, London: Arnold
- Heibert (2008). *Transforming worldviews: an anthropological understanding of how people change*. Grand Rapids, MI: Baker Academic.
- Heron, J. (1992). *Feeling and personhood: psychology in another key*. London: Sage.
- Hill, R., Baird, A., Buchanan, D., Denman, C., Fischer, P., Gibson, K., Johnson, J., Kerry, A., Kulka, G., Madsen, E., Olbar, A., Olbar, L., Pierce, J., Shuan, J., Shipton, E., Shipton, H., Smith, J., Sykes, R., Walker, E., Walker, W., Wallace, P., Yerry, B., Yougie, D., Ball, D., Barney, E., Buchanan, R., Buchanan, Ronald, Denman, H., Fischer, R., Gibson, R., Talbot, L., Tayley, E., Tayley, N., Walker, D., Walker, F., Walker, K., Wallace, M., & Yougie, L. (2004). *Yalanji-Warranga Kaban. Yalanji people of the rainforest fire management book*. Cairns: Little Ramsay Press.

- Holt-Jensen, A. (2009). *Geography: history and concepts: A student guide*. (4th ed). London: Sage.
- Hubbard, P., Kitchin, R., Bartley, B., & Fuller, D. (2005). *Thinking geographically*. London: Continuum.
- Huckle, J. (1996). Realising sustainability in changing times. In J. Huckle & S. Sterling (Eds.) *Education for sustainability*. London: Earthscan.
- Huckle, J., & Sterling, S. (1996) (Eds.). *Education for sustainability*. London: Earthscan.
- Hutchinson, N. (2013). *Personal geography*. Retrieved from <http://nhutchpersonalgeog.weebly.com/country.html>
- Inkpen, R. (2005). *Science, philosophy and physical geography*. London: Routledge.
- Jackson, J. (1976). The domestication of the garage. *Landscape*, 20, 19.
- Johnston, R., & Sidaway, J. (2004). *Geography and geographers: Anglo-American human geography since 1945*. London: Arnold.
- Keeney, B (1983). *Aesthetics of change*. New York: Guilford Press.
- Kilbourn, B. (1980-1). World views and curriculum. *Interchange*, 11, 1–10.
- Kleeman, G. (2009). Through the eyes of others: the role of curriculum perspectives in Australian school education. *Geographical Education*, 22, 18–27.
- Kleeman, G. (2012). Towards a more inclusive curriculum: the perspectives of Aboriginal and Torres Strait Islander Peoples in geography curriculum documents. *Geographical Education*, 25, 24–28.
- Kohen, J. (1995). *Aboriginal environmental impacts*. Sydney: UNSW Press.
- Ley, D., & Samuels, M. (1978). *Humanistic geography, prospects and problems*. Chicago, IL: Maaroufa Press.
- Lockton, H. (1990). *A Christian worldview of the geographer's world*. Arts Papers and Journal Articles Paper 5. Retrieved from http://research.avondale.edu.au/arts_papers/5/
- Lowenthal, D. (1961). Geography, experience, and imagination: Towards a geographical epistemology. *Annals of the Association of American Geographers*, 51, 241–260.
- McLuhan, T. (1994). *The way of the Earth: Encounters with nature in ancient and contemporary thought*. New York: Simon & Schuster.
- Meadows, D. (1982). Whole Earth models and systems. *The CoEvolution Quarterly*, Summer 1982, 98–108.
- Meadows, D. (2009). *Thinking in systems: a primer*. London: Earthscan.
- Merchant, C. (1992). *Radical ecology: The search for a liveable world*. London: Routledge.
- Merchant, C. (1994). *Ecology*. Atlantic Highlands NJ: Humanities Press.
- Morgan, J., & Lambert, D. (2005). *Geography teaching school subjects 11–19*. London: Routledge.
- Mulcahy, D. (2012). Affective assemblages: body matters in the pedagogic practices of contemporary school classrooms. *Pedagogy, Culture & Society*, 20, 9–27.
- Neidjie, B., Davis, S., & Fox, A. (1985). *Kakadu man*, Queanbeyan: Mybrood.
- Norton, B. (1991). *Toward unity among environmentalists*. New York: Oxford University Press.
- Olafson, L., Schraw, G., & Vander Veldt, M. (2010). Consistency and development of teachers' epistemological and ontological world views. *Learning Environments Research*, 13, 243–266.
- O'Riordan, T. (1990). On the greening of major projects. *The Geographical Journal*, 156, 141–148.
- Peet, R. (1998). *Modern geographical thought*. Oxford: Blackwell.
- Pepper, S. (1966). *World hypotheses: A study in evidence*. (5th Printing). Berkley & Los Angeles: University of California Press.
- Peters, R. (1967). *The concept of education*. London: Routledge & Kegan Paul.
- Proper, H., Widden, M., & Ivany, G. (1988). World view projected by science teachers: A study of classroom dialogue. *Science Education* 72, 547–560.
- Reason, P. (1994). *Participation in human enquiry*. London: Sage Publications.
- Renwick, W. (2005). Review of *Contemporary Meanings in physical geography: From what to why?* by Stephen Trudgill & André Roy. *Geographical Review*, 95, 609–611.
- Rose, D. (1996). *Nourishing terrains*. Canberra: Australian Heritage Commission.
- Schraw, G., & Olafson, L. (2002). Teachers' epistemological world views and educational practices. *Issues in Education*, 8, 99–148.
- Stanner, W. (1979). *White man got no dreaming*. Canberra: ANU Press.

- Staub, F. C., & Stern, E. (2002). The nature of teachers' pedagogical content beliefs matters for students' achievement gains: Quasi-experimental evidence from elementary mathematics. *Journal of Educational Psychology, 94*, 344–355.
- Sterling, S. (1993). Environmental education and sustainability: A view from holistic ethics. In J. Fien (Ed.), *Environmental education: A pathway to sustainability*. Geelong: Deakin University.
- Sterling (2003). *Whole systems thinking as a basis for paradigm change in education: explorations in the context of sustainability*, thesis submitted for the degree of Doctor of Philosophy of the University of Bath. Retrieved from www.bath.ac.uk/cree/sterling/sterlingthesis.pdf
- Sveiby, K., & Skuthorpe, T. (2006). *Treading lightly: The hidden wisdom of the world's oldest people*. Crows Nest: Allen & Unwin.
- Torres, P. (2006). Nila.Ngany – possessing/belonging to knowledge: Indigenous knowledge systems in Aboriginal Australia. In J. Kunnie & N Goduka (Eds.), *Indigenous peoples' wisdom and power: Affirming our knowledge through narratives*. Aldershot: Ashgate.
- Trudgill, S., & Roy, A. (Eds.). (2003). *Contemporary meanings in Physical Geography: From what to why?* London: Retrieved from http://www.amazon.com/Indigenous-Peoples-Wisdom-And-Power/dp/0754615979#reader_0754615979
- Tuan, Y-F. (1974). *Topophilia*. New York: Columbia University Press.
- Waitt, G., McGuirk, P., Dunn, K., Hartig, K., & Burnley, I. (2000). *Introducing human geography: Globalisation difference and inequality*. Frenchs Forest: Pearson Education Australia.
- Williams, C. (2006). *Green power: Environmentalists who have changed the face of Australia*. Sydney: Lothian Books.