Chapter 9
Beyond Sustainability: New Visions for Human Econnection in Early Childhood Education

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Introduction

According to Crutzen and Ramanathan (2000) we are now living in the time of the Anthropocene – a geological time where humans as a single species, are having the greatest impact on Earth systems. Climate change, diminishing biodiversity, environmental degradation, and variations in ozone protection of the Earth are all human-generated phenomena and combined, constitute one of the most significant changes the Earth has seen in human history (Bender, Burns, & Guggenheim, 2006).

Since the 1970s there has been a concerted effort to counter the negative impacts of human activity on the Earth. As the indicators and impacts of changing climate worsen (Davis, 2010) it is clear that new approaches are needed. Such action requires new ways of thinking about our relationship with the Earth that encompasses environmental issues, social justice and access to resources, cultural and personal wellbeing, politics and business considerations, and education. This imperative and the acknowledgement of the period of the Anthropocene have given rise to a number of philosophies and theories (see Somerville, Chap. 2), and in this chapter, I draw on these theories in two ways. First I identify some of the theories that have previously underpinned environmental education practice in the early childhood sector such as biophilia (Wilson, 1984), ecopsychology (Roszak, 1998), and nature deficit disorder (Louv, 2006) and consider their past positive characteristics. However, I also examine the ways in which they may now be contributing to barriers for implementing effective early childhood education for sustainability (ECEfS) as the early childhood sector struggles to implement high quality practice in sustainability education (Australian Children's Education & Care Quality Authority [ACECQA], 2014). Secondly, I engage with emerging posthumanist

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(Rautio, 2013; Somerville, in press) and relational materialism (Hultman & Lenz-Taguchi, 2010) theories and the ways in which they can be enacted through arts-based pedagogies in early childhood. Through discussion of these theories and by using practical examples from my research and arts-based practice, I am attempting to find ways of making these contemporary theories accessible to early childhood educators and to find new ways for *eco*nnection and for engaging with the Earth and with the challenges we face in these precarious times.

The notion of *eco*nnection used in this paper acknowledges the relationships that humans have with the nonhuman world through ecopsychology, biophilia and place connection. In addition, this notion of *eco*nnection includes affective states such as wonder (Wilson, 2010), the notion of love for the natural world (Gray & Birrell, 2015) and the affinity that we have with the natural world through artistic sensibilities such as recognition and appreciation of colour, movement, dynamics, form, sound, and smell. These fundamental qualities not only serve to assist us to apprehend the phenomena of experience but also work deeply into our long term memory assisting us to consolidate understandings, build up schema and through creative expression, to reengage with and relive experiences (Eisner, 2002) after the primary occurrence.

Theoretical Considerations

This chapter conceptualises the theoretical perspectives often applied to ECEfS in two waves: the anthropocentric and the posthumanist. The anthropocentric perspectives and theories place the human at the centre of species and Earth formations. These include biophilia (Wilson, 1984), which highlights the biological and chemical similarities between humans and the elements of the Earth and reasons that due to these inherent similarities humans have a yearning to be connected to the natural world. We want to spend time in nature, we feel good in nature and, at the same time, we have a desire to master and control it (Wilson, 1984). Ecopsychology (Roszak, 1998) is also part of the first wave and approaches our relationship with the natural world through the psyche by attributing to humans a subconscious ecological ego that is essential for our sense of identity and belonging. This comes via the recognition that we are part of the Earth and the cosmos and deeply, psychologically connected to it through this relationship. More latterly they also include nature deficit disorder (Louv, 2006) wherein the lack of exposure to nature causes physiological, emotional, and psychological deficits.

The posthumanist philosophies and theories in focus in this chapter stem from post-structuralist and non-human paradigms, and offer possibilities for responding to the anthropocene (see Somerville, Chap. 2, this volume). Decentring the human and reconfiguring the relationship between human kind and the planet, these theories include posthumanism (Barad, 2003; Haraway, 2008), relational materialism (Hultman & Lenz-Taguchi, 2010; Rautio, 2013) and common worlds (Taylor, 2011). By engaging with these theories using art-based pedagogies to interpret and enact them, I explore the possible synergies and the ways in which they can rein-

vigorate ECEfS. I also consider how they can be applied to particular curriculum areas and discuss why these new lenses are relevant in helping to develop a society that lives in a sustainable, harmonious and joyful state of being with the Earth.

Nature and Culture

Throughout history, Aristotelian and Cartesian philosophy has positioned humans at the pinnacle of evolution where mind, culture (collective mind), and the psyche or soul are the attributes that reify us but position the body in the realm of nature (Louv, 2006; Shields, 2009) along with the natural world which is a sum of particles that make matter (Barad, 2003). While nature has been seen as something that is good for us (Dewey, 1926; Suzuki, 1997; Warden, 2012), it is not of us. However, it is available for us to utilise for the benefit of our conscious, intentional minds, creating a modified context for our enacting of human culture and for supplying our physical needs for shelter, food, leisure etc… Indeed it is this utilitarian attitude toward nature that is the root of our current planetary imbalance (Louv, 2006; Macy, 1995; Roszak, 2001) and has left us with a legacy of a nature/culture binary that has become the status quo.

The first wave theories and approaches articulated above, while seeking to connect us to the natural world in an effort to address humankind's disconnection from nature and the resulting planetary ailments, are still, anthropocentric in essence. These include but are not limited to biophilia (Wilson, 1984), ecopsychology (Roszak, 2001) and nature deficit disorder (Louv, 2006). That is not to say that the practices they generate should be discounted. Indeed much good work has come from a focus on and through them (Buchan, 2015; Kiewra, Reeble, & Rosenow, 2011). The key tenets of these theories can be seen in the rationale for many more recent iterations of sustainability education in the western world with adventure camps, outdoor challenge courses, and in Forest schools (Knight, 2009) and Walderkindergartens (Esterl, 2008). While these theories have the benefit of positioning humans more closely with the natural world, they assume the human as the dominant player, manipulating, perceiving, appreciating, or engaging in nature. While promoting awareness of the natural world and encouraging humans to experience and appreciate it, the very articulation of the need to bring nature and culture together, while valuable in its own right, also has the potential to reinforce the nature/culture bifurcation.

Nature/Cultures – Common Worlds

A recent new turn of theories that decentre the human or posthumanist theories include Latour's (2005) actor-network theory where human and nonhuman objects can participate in social networks and give rise to material-semiotic relationships.

Similarly, relational materialist theories (Dolphijn & van der Tuin, 2012; Hultman & Lenz-Taguchi, 2010), where humans and nonhumans interact, have become a lens for investigations into human (culture)/nonhuman (nature) and position humans as part of nature where the nonhuman has agency and where cause and effect may flow from the nonhuman to the human. (See Malone and Truong, Chap. 1 in this volume for more discussion on posthumanist theory). Rautio (2013) gives an example of children engaged in the autotelic practice of carrying stones in their pockets. The motivation is simply that the stones are there to be collected and carrying them and perhaps feeling or looking at them is reward in itself that is prompted by the presence of the stones in the first instance. This action may also lead to other intra-actions that unfold depending on how and where the child engages with the stones. Taylor (2011) discusses these concepts by talking about an assemblage of messy connections, where the human and nonhuman are interrelated actors in common worlds that recognise the multifaceted realities in which children live – rather than requiring them to live in a pure state in nature in order to reap the benefits of such an existence. For example, the child takes the stones and arranges them on a shelf in their bedroom beside a small glass sculpture, a soft toy, and some seed-pods. These items are relegated to a similar place in the child's regard and coexist in a human-made and natural context where the child engages with, thinks about, and is prompted by his or her ongoing relationship with them.

The interrelationships between the human and nonhuman are taken a step further through Barad's agential realism (2003) where the relationship becomes one of intra-relations – a merging of the actors both human and nonhuman. On a recent research trip I had very telling example of this. In an environmental art class, I was handed a palm-sized red/orange, smooth, water-rounded stone. However, this stone turned out to be the remnants of a brick that was built at the Toronto Brickworks during the depression years, used in a city building, thrown into Lake Ontario during a rebuilding program in the mid twentieth century and then eroded by the waves in the lake to form a natural looking stone. Both nature and humans had intra-acted and at different times changed the form, use and effect of this brick or stone. To use a classroom example, this merging of actors may be conceptualised more readily by imagining a drama scene in which a child is playing a character of the wind (See Fig. 9.1).

Movement, body, idea, and imagination merge to become the wind for an instant and the players become merged in an intra-active nature/culture moment where the possibility of being in a state of common worlds exists (Taylor 2011). While an example such as this is readily comprehensible due to the creative arts elements of culture with which many are familiar, Barad (2003) takes this idea of intra-relations to an atomic level where the interplay of bodies, concepts, cause and effect are in a constant state of evolving, or performativity, and where boundaries are enacted through "agential cuts" (p. 824) in time, which define and give rise to discourse, products, and objects, such as the performance of the wind or the stone. The moment of being the wind is perceived during one of these agential cuts where subconscious perception of biological and anatomical interplay coalesces into awareness and being.

Fig. 9.1 Jake is the wind (Author's photograph)

Having briefly considered the contemporary theoretical frameworks in the Anthropocene, the following question arises: What role do these theories have in changing our relationship with the Earth and what can they contribute to children's predispositions or capacities to develop lasting and sustainable intra-actions with the planet into the future?

Education in the Anthropocene

There have been many efforts at national and international governmental levels (DEEWR, 2010; Department of Environment and Heritage, 2005; Tilbury & Cooke, 2005; UNESCO Section for Education for Sustainable Development, 2005) to prioritise education for sustainability. The evolution of environmental education policy in Australia has followed sequential foci *about* or knowledge of the environment; *in* or experience in the environment; *for* or action for the environment; and *sustainability* or participation in future thinking and action (Tilbury, Coleman, & Garlick, 2005).

Practice in the early childhood sector has also followed this sequence (Davis, 2010) and the Early Years Learning Framework (EYLF) (DEEWR, 2009), and the National Quality Standards (NQS) (DEEWR, 2010) have made ECEfS a requirement. For example, the NQS Standard 3.3 requires early childhood settings to take

an active role in caring for their environment and to contribute to a sustainable future (DEEWR, 2010, p. 104). Outcome Two in the EYLF is particularly explicit, where it highlights the need for children to become socially responsible, to show respect for the environment, and where it refers to children developing an awareness of the impact of human activity on the natural environment (DEEWR, 2009, p. 29). It also highlights the need for a range of natural elements in outdoor environments to foster appreciation for and understanding of nature. These documents, according to Edwards and Cutter-Mackenzie (2011) reflect a more environmental education approach or education *about* the environment and as such could be seen to be anthropocentric in nature, which may serve to reinforce the nature/culture divide. This anthropocentric orientation in the documents could be more likely to generate feeling among educators that ECEfS is something more they have to do in order to achieve accreditation. Indeed, the NQS Quality Standard Three has the second highest number of services that have either not met or are still working towards meeting the required standard (ACECQA, 2014, p. 63). While there are some exemplar services who have received an 'excellent' rating for Quality Standard Three, this rating has been awarded, for Standard Three, to the second lowest number of services in Australia (ACECQA, 2014, p. 63).

Elliot and Davis (2009) identify some key barriers to early childhood services implementing ECEfS. They include the lack of research in ECEfS and the time it takes for research to infiltrate everyday practice. They also suggest that many early childhood educators hold the view that outdoor play is sufficient outdoor experience, and for many, that sustainability issues are considered too difficult to address with young children. They highlight the anthropocentric nature of much poststructural theory in the early childhood field, and its focus on language, and the extent to which it can silence discourses around the role of nature.

Barad (2003) also talks about language being "too substantializing" (p. 203) and points to a need for performative understandings to consciously intra-act with the discursive nature of matter. This means developing an awareness of the agency of the nonhuman as actor in our lives and recognising the common worlds we inhabit. From this naturecultures perspective early childhood educators may be more inclined to recognise the symbiotic relationships between humans and the other than human world and to see the potential for transformative curriculum that is possible when the natural world is considered an intra-active agent in our lives and brought to life through the arts.

Common Worlds

As discussed earlier in this chapter, nature and its attendant ecosystems, are often seen as outside, as separate to the human made world, and as pure and stable. However, when we examine closely it becomes apparent that the natural world is a complex assemblage of parts that are in a constant state of interaction with humans (Taylor, 2011). This may include small green spaces in streets, vacant blocks,

parklands, backyards, beaches, local national parklands, playgrounds, etc. All of these spaces have ecosystems that include flora and fauna that live in varying degrees of proximity and in a state of dynamic interaction with human made worlds. The more urban of these green snippets may also be the main experience many children have of the natural world (Malone, 2004). The idea of common worlds used by Taylor, originating and extending on Latour's (2004) notion of "composing common worlds" (p. 91) is a phrase that is used to signify the bringing together of nature and culture in a manner that provides access to intra-activity. It is particularly useful in recognising the elements of the nonhuman world available in a given space. Common worlds validates the interactions between human and nonhuman without recourse to romanticised versions of pure nature. The various messy ways that human and nonhuman interact – whether it be through stewardship of local flora and fauna, food production and waste, or mining for energy and building resources or water consumption, must be recognised. To experience common worlds it is useful to consider other ways of knowing and being and a most useful way of accessing these other ways of knowing is in education is through the arts (Egan, 1997; Eisner, 2002; Wright, 2012).

In my practice as a kindergarten teacher and as a researcher (Tarr, 2008a, 2008b, 2009; Ward, 2011, 2013), I have used arts-based pedagogies to deepen experiences, reinforce concepts, and enliven ideas – particularly when engaged in supporting young children to understand their local environment. For young children this begins through joint investigation of the local area, the plants and animals that are part of our everyday lives, and creatively rendering these facts into stories. While this process often involves a degree of anthropomorphising, I am referring only to giving the creatures or characters in these stories a voice that may describe their experiences and interactions in situ – not to non-representational characterisations such as koalas in frilly bonnets making scones. Creating and telling stories about the interaction of the animal or plant, their possible adventures (according to their capacities, habitats, and role in the complex ecosystems to which they belong) and their characteristics is a first step in establishing a creative bridge from the cognitive to the imaginative. Marveling about the capacity of an ant to carry ten times its weight or the willingness of a native bird to nurture the newly hatched chick of an interloper cuckoo are matters of fact but also examples of strength, endurance and adaptation that have inherent movements, sounds, and interspecies/social interaction associated with them. Creating verses, songs, drama, or dance experiences or a visual arts representation of these characters brings them to life further and allows for the children to engage in what Somerville (2012) calls a postmodern emergent experience where the natural world is experienced in multiple creative modes. This is exemplified in her description of seeing a video presentation of a rehearsal for a children's end of year concert where she describes them as becoming frogs:

> There on the interactive screen, the children came to life as frogs, dancing their frog dance to music made entirely of frog calls. The children get to know the frogs in the wetlands. They learn how frogs live and move, and the sounds of the distinctive calls of each species. The classroom, cleared of clutter becomes the space of the wetlands. Children dance to frog calls, moving frog limbs, fingers splayed, jumping, leap frogging, becoming-frog to frog music (Somerville, 2011, p. 67).

While creative arts are not what Barad (2003) is referring to when she talks about performativity in agential realism, there is a sense in which the intra-active performativity between human and nonhuman is still occurring. The depth of knowledge gained through multiple experiences of performing, expressing, and being render the relationship as one of intra-action between frog and child and will influence later knowledge and decisions where these relationships are focal. Here the corollary of Chawla and Cushing's (2007) findings, that children, whose experiences in the natural world, that are positively scaffolded by significant adults, are more likely to engage in actions related to environmental stewardship as adults, resonates. The teachers in the above scenario have certainly privileged the children's primary experiences in the wetlands, their subsequent deep exploration of the frogs they encountered there and the development of related artifacts through drama and costume making.

These creative artifacts, the dispositions toward the planet and the practices engaged in by these children, and those in the example of being frogs above, are the 'agential cuts' (Barad, 2003) in time that result in performing the intra-activity between human and nonhuman and bring nature and culture together. The understanding gained through these experiences encompasses but goes beyond biophilia and ecopsychology to a deep awareness that we are nature, nature is us, and together we are a common world. In my own practice as a kindergarten teacher, the children engaged in ongoing, emergent common world experiences as they performed, sculpted, coloured, sang, and moved the elements of the natural world in which they lived. This creatively imbued manifestation of common worlds is a fundamental expression of *eco*nnection and these experiences formed the basis of our curriculum.

Performativity, Arts, and Science

The process of bringing together human and nonhuman into common worlds can be explored in a number of ways in the classroom and with all age groups. Investigation into systems, ecologies, and relationships in the natural world reveal wondrous processes and models of intra-action and are applicable to all subjects justifying the development of an eco-centric curriculum. For example, simple processes that have inherently mathematical properties such as the logarithmic unfurling of the Fibonacci series in leaves, or the golden mean inherent in the nautilus shell, are examples of 'bioinspiration' (San Diego Zoo Global, 2012; Saylan & Blumstein, 2011) that have inherent form and symmetry that can be explored through natural sciences, arts, and humanities.

Combining the creative arts and the natural sciences in the daily program can also form inspirational curriculum. After a story about the 'Sundancers' (characterised sunbeams – during my doctoral research) the children engaged in water-colour painting (see Fig. 9.2) and were fascinated by the 'dancing' (Ward, 2011, p. 124) of the colours and the emergence of secondary and tertiary colours which led to in-

Fig. 9.2 Children engaged in water-colour painting (Author's photograph)

depth investigations with light tables, creating rainbows using sprays of water outside in the sun and prisms hung in windows for refracting light. The children also enacted 'dancing the colours' by putting on partially transparent silk veils and dancing together to become secondary colours – an example of combining cognition, imagination and being or another kind of performativity (Barad, 2003) that consolidates knowing. This enacting and understanding of the rainbows goes to the heart of the relationship between light and water (Ward, 2015).

   In another preschool, a child, having heard a story about kookaburras looking for a new home, created a home for them by creating a drawing of a hole in a tree (see Fig. 9.3). This child had considered the rain and the fact that the kookaburra would be wet and cold with nowhere to live.

   The examples above reflect the children's intra-action with the story content and characters (that came from the nonhuman world in their own local environments), their identification with them and a momentary being in common worlds with them that included embodiment through empathy, scientific experimentation, dance, drawing, and painting. These activities and examples show the extent to which a locally oriented eco-curriculum can be generated that is relevant to all subjects in education. This eco-curriculum is infused with engaging exemplars from the natural world and in particular with the natural worlds which surround the places in which children live and intra-act.

Place: Individual and Community Identity

Place plays a pivotal role in children's lives (Marcus & Francis, 1997; Sobel, 2005; Somerville 2012, 2013; Tooth & Renshaw, 2009). Understanding of the local area, civic and commercial realms in which they live is a contributing factor in identity

Fig. 9.3 Drawing a nest
for the Kookaburra
(Author's photograph)

development, sociocultural funds of knowledge, and social efficacy (Orr, 2005). Even small urban green spaces are a feature in children's experience of place and provide opportunities for developing resilience, for reduction in stress, and for restoration (Chawla, Keena, Pevec, & Stanley, 2014; Malone, 2004). It is no surprise that immersion in green spaces supports wellbeing. The additional point being made here is that research also indicates that intra-acting with the myriad of processes and dynamics of the other than human world through creative investigation across the curriculum also supports this sense of belonging and a 'connected' state of being (Torquati, Gabriel, Jones-Brand, & Leeper-Miller, 2010; Ward, 2011).

Connections between natural processes and curriculum content are not new in education although recontextualising them through relevance to place and through multimodal exploration make them more meaningful. Findings from my research (Ward, 2011) with preschool children showed that stories about place had sufficient meaning for the children to claim them as 'their stories' and to share the stories of the local natural features with their families. This in turn resulted in additional family outings on weekends to the beach, park or other local areas, which became a trigger for family learning in place and identifying with local place. David Sobel (2005) reports on numerous programs with children engaged in civic exploration and action where they learned about their local human and nonhuman environments, including the local civic infrastructure. The key message here is that when children become acquainted with and identify with the features of their place, they readily engage in remediation, planning, advocacy, arts, problem-solving, and future-oriented sustainable thinking.

Lorimer (2012) supports this idea in talking about an "interdisciplinary biogeography" (p. 594) as being essential for navigating our way through the Anthropocene where questions about the nature of nature, biodiversity and difference, social justice, and political power may be asked and genuine answers sought. Engaging children in conversations and experiences about their place on the planet, their identity as human and nature, and their role as social beings now and in the future are essen-

tial. Promoting engagement through the arts and postmodern emergence (Somerville, 2012) provide an anchor to place and an entry point to experiencing common worlds. By including investigations about local flora/fauna and phenomena as key elements in educational curricula, we also provide a platform from which to engage in common worlds where cause and effect are experienced in the doing and an ecological performativity becomes a conscious state of being.

Conclusion

This chapter has engaged with some of the key issues in education for sustainability in the Anthropocene. It has discussed some of the issues and barriers to effective education for sustainability and sought to reposition the human relationship with the natural world through reference to posthumanist paradigms in ECEfS.

Human and nonhuman relations have been explored through relational-materialism and posthumanist lenses and the centrality of 'place' in education has also been shown to be intrinsically linked to human relationships with and in the natural world. Common worlds and our intra-relations with the nonhuman worlds have been highlighted as relevant and useful underpinning concepts in education curricula and align strongly with arts-based pedagogy and eco-curriculum approaches. *Eco*nnection has been described as the power of experiencing common worlds through cognitive, psychological, affective, and arts-based experiences that work deeply into the child's identity as a common worlds citizen, deepening their connection to place and their sense of stewardship for the human and other than human worlds.

Finally, facilitating this strong sense of identity and community have been highlighted as essential components of engagement in ECEfS in order for children to have a sense of belonging to place, of being in relationship with the natural world and a sense of becoming citizens of the future who know intrinsically that nature is us and we are nature.

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