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Children in the Anthropocene

Rethinking Sustainability and Child Friendliness in Cities

Karen Malone

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Karen Malone
University of Western Sydney Bankstown Campus
Milperra, New South Wales, Australia

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Foreword: Researching Children's Precarity in the Post-Apocalypse

How does one do research with children or for that matter any kind of research in the epoch called the Anthropocene? Facing the apocalyptic visions of ecologists and geologists about the impending disaster from humanities' impact on the planet, should we calibrate our research data, check our sample size, run tests of validity and construct our interview schedule? Is it business as usual? What does it mean to do research in the Anthropocene when we are facing the end of the world or at least a momentous and catastrophic series of events? Somehow the purpose and meaning of research seem to shrink away. The significance of children's different learning styles, analyses of poor achievement and reports of inequalities between groups fades against the face of an impending and rapid world deterioration. When the existence of the species and the planet is threatened, 'normal research' becomes somewhat trivial, even irresponsible. 'Hey kids, the world is going to end in terrible storms and other extreme weather events, nuclear war, climate change … Now please turn to page X and answer the questions!'

Karen Malone is the intrepid Australian childhood and sustainability researcher who travels to places like Kazakhstan in a future that already outstrips the dystopian mood of the Mad Max movies and in a strange light begins to investigate the way life picks up again in the zone of radiation where babies have been genetically malformed with faces that look like the distorted and haunted faces of a Francis Bacon painting. In the northern crossroads of this country of Central Asia once inhabited by nomadic tribes, Karen has been involved with childhood and sustainability research for five years. It is a country which has been used as the testing

site for the Soviet Union's nuclear weapons. Known as Semipalatinsk or 'The Polygon' located in the northeast steppe country, the Soviets secretly tested over 450 tests between 1949 and 1989. Fissile material remained. Abandoned areas with large amounts of plutonium in the mountain, tunnels became the object of an international clean-up. Cancer rates were very high among the local population who started their anti-nuclear movement in 1989. Malone's photos and theorizations of Semipalatinsk are as chillingly horrific as any science fiction movie, and her materialist and 'posthumanist' research just seems incredibly apt in the post-apocalyptic landscape that is now a UNESCO World Heritage site.

As a professor of sustainability at Western Sydney University, Karen Malone has taken 'the critical activist turn' that she self-describes in a stage theory of onto-methodology—from 'cultural sociological turn' to 'post-humanist and materialist turn' that brings into focus an eco-intersubjectivity that decentres the self into material and living networks that are used as a means for researching developments in Europe and South America, in countries such as Bolivia and Kazakhstan to collect, organize and analyse data in ways that reflect a posthumanist and materialist orientation. *Children in the Anthropocene* is a brave account of the relevance of sustainable development for children growing up in precarious slum communities in the steep valley ravines of La Paz and in regions of Kazakhstan that will be recovering from nuclear testing and other environmental atrocities for hundreds of years.

Posthumanism in this context first means going beyond humanism, what we might call the critique of humanism as the reigning ideology of liberal politics that demands an autonomous and rational subject—an individual adult subject-centred reasoning agent. 'Children' never easily fit into this construction, and even as an educational goal, the rational autonomous subject seems misplaced in a global environment that is invested with all kinds of interconnectivities that spill over from subjects to emphasize inter-subjectivities. This is the original intent of Martin Heidegger's (1998) 'Letter on Humanism' when he asks 'in what does the humanity of the human being consist?' to answer 'it lies in his essence.' But how is the essence of human being determined:

> Marx demands that "the human being's humanity" he recognized and acknowledged. He finds it in "society". The "social" human is for him the "natural" human. In "society" human "nature," that is, the totality of "natural needs" (food, clothing, reproduction, economic sufficiency), is equably

> secured. The Christian sees the humanity of man, the *humanitas* of *homo*, in contradistinction to *Deitas*. He is the human being of the history of redemption who as a "child of God" hears and accepts the call of the Father in Christ. The human being is not of this world, since the "world," thought in terms of Platonic theory, is only a temporary passage to the beyond. (Heidegger *Pathmarks*, p. 244)

Thus posthumanism contains the moment of anti-humanism. Malone makes posthumanism 'safe' for children by examining the construction of 'human nature' and a kind of connectionism of all beings with the living biota that makes up the environment in order to emphasize the role of non-human agents in relational ontologies and an analysis that starts from the analysis of social practices. This is to recognize the deep connections and affinities of the ecological worldview with the notion of posthumanism to redefine the place of humanity in the world.

Karen Malone is a pioneer who works at the margins and intersections of the new materialism and posthumanism to examine children's lives in the Anthropocene: she focuses on cities in global crisis, slums and poverty in urban environments, urbanization in Bolivia and Kazakhstan, and what she calls 'Post-positivist Place-based Research with Children'. And she does this in a way that emphasizes 'polyvolcality', oral methods of storytelling, focus groups, and interviews and visual methods using children's drawing, mapping and photography.

Malone writes from the heart and yet without a sentimentality that could cloud research judgement. Unlike so much research in sustainability these days, she engages with us as it informs making surprising connections and revealing interesting new configurations.

Inexorably, the book moves to a systematic reflection upon itself and its own methods and underlying philosophy as it approaches 'the restorative value of Anthropocentric environmentalism' to examine 'children on the edge of nature', 'Bodies as assemblages' and 'Monstrous bodies'. To bring together two intersecting narratives that of children and their plight in the Anthropocene, Karen Malone manages to make sense of children's lives at a time when increasingly fragile Earth systems threaten the prospect of inter-generational environmental justice. Donna Haraway (2015, p. 160) suggests: 'I think our job is to make the Anthropocene as short/thin as possible and to cultivate with each other in every way imaginable epochs to come that can replenish refuge.' Malone sets out to show us how research can help offer children some form of refuge.

Michael A. Peters

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Dr Michael A. Peters, (FNZAH, FRSA, Hon. FRSNZ, FPESA)
Professor, Wilf Malcolm Institute of Educational Research
Te Kura Toi Tangata Faculty of Education, The University of Waikato, New Zealand
Professor Emeritus, University of Illinois Urbana Champaign, USA.

Acknowledgement

In the final chapter of the book, I write: 'We are not all in the Anthropocene together – the poor and the dispossessed, the children are far more in it than others.' It is the children who are at the centre of this book that I would like to take a moment to acknowledge. Over the past 20 years, I have worked in many nation states on a variety of child/environment-focused research investigations around the globe. These projects all had in common the desire to explore with children their everyday experiences of growing up with and through the urban environments. During my travels, I met amazing children who, even though their lives were challenging, shared a smile along with their hopes and dreams for a better future for themselves and the animals and plants they lived with. By engaging in photography, mapping, walking, interviews and drawing, thousands of children created data that could be documented and reported back to other children, city councils, community members and UN officials. There was a diversity of communities where I worked: orphaned children in South Africa, children from rural and urban villages in the Cook Islands and Papua New Guinea, rural and regional cities and towns in Albania, Australia, Indonesia, Japan, Kazakhstan and Tanzania, and children in slum communities in India, Nepal, Chile and Bolivia. I thank all these children and their families for supporting the projects and allowing me and my researchers to be welcome in your lives. While the children's data from Kazakhstan and Bolivia are most central to this book, it has been this history of working with children across the globe that has informed my ongoing insistence that children with the non-human others they occupy the planet with need to have a voice in these precarious times of the

Anthropocene. That they will inherit and respond to the consequences of a world adult humans have altered through our exploitative anthropocentric greed and desires. And those children, who walked with me on mountain tops and narrow city streets and will inherit this uncertain future, deserve to be recognized and acknowledged in these critical debates of the Anthropocene. I hope this book does justice to their openness and willingness to walk with me.

From La Paz with the deepest of gratitude I would like to thank my good friend and colleague Maria Elena Acarapi. When I first started visiting La Paz, she was a shy, young woman who had just finished her university degree. Over the past five years, she has been instrumental in supporting my work with the communities. Having grown up in challenging times herself, she talked with me from the heart, always showing great love and compassion for all of us in the field. She is now a proud and confident council employee and mother, and her story is one of resilience and determination. In La Paz, I would also like to thank my colleague from UNICEF Roberto Rivero for being a great ally and welcoming me into his world. Additionally, I would also like to acknowledge Lindsay Hasluck who has been my research partner for over 20 years. It was his love of Bolivia that enticed me to La Paz and his support in the setting up of the research that contributed to its success. He has always been a wonderful source of information, and his sharing of the everyday life of La Paz was always close to my thoughts as I typed away on the manuscript. Finally, I would like to acknowledge my daughter Monique who accompanied me on my journeys into La Paz. She documented the research process for the first time through her stunning photographs and worked tirelessly in the field supporting the children to develop their own photographic stories.

The second country that features in this book is Kazakhstan. While in this country, I also found a community of supportive and scholarly colleagues from UNICEF who supported the research work with the children. Firstly, I would like to thank Faniya Mussayeva whose initial invite to Kazakhstan in 2011 started me on a journey of discovery that has changed my view of the world forever. During my four years in Kazakhstan, my closest support and ally was Anya Stativkina, and I am most grateful to her dedication and commitment to bringing the life of children in this unknown country to others. I would also like to acknowledge the teachers, university students and children in the cities of Aktau, Almaty, Astana, Semipalatinsk and Kzyzlorda who graciously supported our research intrusions in their school and after-school life.

Back in Australia I would like to thank my research assistants Katina Dimoulias and Ingrid Segovia who worked to develop the quantitative and qualitative elements of the data ready for my book writing. I would also like to recognize my colleagues Affrica Taylor, Margaret Somerville, Marek Tesar and Pauliina Rautio for their inspiration and supportive feedback on the theoretical work involved in my shifts to explore the Anthropocene using new materialist and posthumanist analysis. Finally, I would like to also acknowledge my two closest and most supportive kin. Carol Birrell I want to thank you for sitting through many hours of talking, unpacking, reading and deep thinking on each page of the manuscript and to Poppy my non-human companion who sat at my feet, you reminded me every day that I share this world with a host of others.

During the year of the writing and birthing of the book, another birth was taking place. I became a grandmother for the first time. When I saw my granddaughter's face for the first time, the urgency of the call and the weight of the Anthropocene for children's lives became momentous. Therefore, I dedicate this book to you and your future, Hope (Birdy) Hardwick.

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CHAPTER 1

Children and the Anthropocene, a Re-turning

Nothing epitomizes the precarious nature of the planet for me than the view as you fly from the high mountain plateaus of the Altiplano towards the El Alto airport and see spread out in front of you the immense sprawling valley where the city of La Paz is perilously situated. The image of a vastness of crowded slum communities perched on the high reaches of the escarpment and spilling down into the steep, treeless ravines and gorges of the valley is breath-taking: a human imprint at a global scale. A fragility of human and non-human worlds engaged in a dance of daily survival, hanging on, it seems, by the sheer grit of determination, with children's lives being the most precarious in this shared vulnerability.

Gaia Vince reminds us:

> We are an incredible force of nature. Humans have the power to heat the planet further or to cool it right down, to eliminate species and to engineer entirely new ones, to re-sculpt the terrestrial surface and to determine its biology. No part of this planet is untouched by human influence – we have transcended natural cycles, altering physical, chemical and biological processes – (Gaia Vince, *The Guardian,* September 2015)

City children are often perceived as the most disadvantaged human group in the Anthropocene. Cities throughout human history have been difficult and risky places for children, with urban childhoods in the twenty-first century continuing to be played out in crowded, polluted environments, with limited opportunities to engage with nature, animals

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or other non-human elements. Living on the urban fringes of major cities in minority countries, many children and their families live in poverty, exposed daily to a host of challenges. These challenges often contribute to a child's inability to move freely and safely when accessing resources for play or work, or services such as schools and health providers. But these are not just contemporary issues. Even though when asked to reflect on their own childhood, many adults reminisce about having far more freedom in their urban places than children have today (Malone 2016), the argument accorded to this 'new' child–city–nature disconnect often relies on an assumption that past generations of children had a closer and more intimate relation with the planet, de-emphasizing what has been 'a long history of urban environmental degradation and childhood disconnectedness (Malone 2001; Chawla 2002; Chawla and Malone 2003; Dickinson 2013) where the experience of being a child in the environment' may not have been a positive one (Malone 2007). The Anthropocene and its impact on children's lives are not new. Children working or living near factories; children being exposed to pollutants in the soil, air and water; children losing homes to rising sea levels and suffering from the impact of natural disasters; children losing opportunities to be in nature, encountering animals; children dying from radiation—all signs of the impending ecological crisis, the advancing consequences of human degradation of the landscape at a planetary level. Cities are 'microcosms of the planet fashioned for our [human] species and no other' (Vince 2015, p. 338), and endeavouring to exist in this 'entirely synthetic human creations' are the children whose stories appear in this book. They are part of the great global movement of urban migration in the Anthropocene. From a slow urban drift in past generations what we see now is a massive tidal wave of humanity headed to live in the contested, ambiguous spaces of the world's largest cities.

The story of the Anthropocene as expressed through the everyday, entangled lives of children growing and being with many others in cities is the focus of this book. Children are living in a world where, for the first time in global history, more humans reside in city environments than those in the countryside. Education, health services, employment, shelter, food and water are alluring possibilities that large urban environments bequeath the poor. Politically, cities have become the solution to the ecological crisis and the problems of the age of humans. Cities have been proclaimed as the means for providing shelter and resources for the steadily increasing populations. Under the auspices of global and national policies

on sustainable development and sustainable cities, the people have been encouraged to move away from their land and find greater potential for themselves and their children in the cities. Despite the hardships encountered in cities, the draw is great; the urban revolution of the Anthropocene has always promised children a better life, a future. But the lure of the city and the call of the Anthropocene haven't always delivered their promises. This book reveals the complexities of children's lives entangled with each other, their families, the communities of humans and the collective of human–non-human that are tied together, knotted in an intricate ecological collective.

Nobel Prize-winning atmospheric chemist Paul Crutzen and biologist Eugene F. Stoermer first used the term Anthropocene in a 2000 publication when they wrote:

> Considering … growing impacts of human activities on earth and atmosphere … it seems to us more than appropriate to emphasize the central role of mankind in geology and ecology by proposing the term "Anthropocene" for the current geological epoch. (2000, p. 17)

Since then, Crutzen and a host of earth sciences scholars and colleagues 'have endeavored to establish an Anthropocene "timeline" by understanding the impacts of humans on earth planetary systems up to, and during, the epoch. They have promoted technologically based solutions for planetary damage and advocated that the International Union of Geological Sciences' Commission on Stratigraphy officially inaugurate the term to acknowledge the impact of humans irreversibly, changing the ecology of the planet (Crutzen and Stoermer 2000, p. 17). Although cited many times, it was the article in *Nature* in 2002 by Crutzen that laid some of the means through which the concept of an Anthropocene epoch could be further conceptualized beyond a scientific endeavour. In this article, he included two further significant points to the argument. The first was to acknowledge that the changes brought about by 'humanity' had largely been caused by only 25 per cent of the human population. The second was to consider that a bold and large-scale sustainability management project needed to be advanced at a global level where all countries contributed to a central goal (Davies 2016). According to Davies (2016), what both themes did was acknowledge that humans in different parts of the world made different contributions to global changes and that a kind of 'geo-engineering' of the planet at a global scale by humans was the only way forward.

While the term is still to be accepted, there has been much debate about where the boundaries lie that would mark the arrival of the new epoch of the Anthropocene. There have been a number of possibilities proposed: the start of the Industrial Revolution in the eighteenth century, or the beginning of the mid-twentieth century, known as the great acceleration of population, carbon emissions, biodiversity loss, plastic production and the beginning of the nuclear age with the first atomic bombs spreading detectable radiation to every strata of the planet (Davies 2016). But for many scholars in the humanities these arguments are not as relevant as what taking up the premise or challenge of the Anthropocene provides. As an unsettling ontology that disrupts a persistent 'humanist' paradigm (Lloro-Bidart 2015), the concept of the Anthropocene allows new conversations to happen around human-dominated global change, human exceptionalism and the nature–culture divide. The Anthropocene, rather than scientific facts, verifiable through stratigraphic or climatic analyses, is a 'discursive development' that problematizes a human narrative of progress that has essentially focused on the mastery of nature, domination of the biosphere, and 'placing God-like faith in technocratic solutions' (Lloro-Bidart 2015, p. 132). In this way it can be employed as a heuristic device for gaining a greater understanding of the role of human societies, the part they have played, in changing the planet and the implications of this on what it means to be human but also what it means to be in relation with a non-human world that is impacted by the consequences of those changes.

Davies (2016, p. 48) also notes that recent postcolonialist scholars such as Dipesh Chakrabarty have questioned the adequacy of 'radical critiques of globalisation, capitalism and imperialism for confronting the idea of a new geological epoch'. Chakrabarty, according to Davies (2016), asks, what are the implications of the Anthropocene on our understanding of human history? In our analysis of social and economic injustices, whatever socioeconomic or technological choices are made or critiqued as an extension of our celebration for freedom, rights, civility, they will never be enough. He instead proposes a mixing together of the entangled story of capital and species history (Davies 2016). Davies, supporting Chakrabarty's argument, raises in his book whether there is a need for historians to trace a deeper history of humankind as a species and over timescales of thousands and millions of years come to know how we (as one of many species) have interacted with the rest of life on

the planet. 'Historians need to tell the story of capital, the contingent history of our falling into the Anthropocene' (2016, p. 49), a shared catastrophe of capitalist globalization and the history of humans as one of many species.

There has also been a strong critique from many in the academy in regard to the naming of the Anthropocene. The main arguments are based on the concept as being universalist and technocratic. The first in particular is important to my research work. Universalism produces an assumption that we (humans) are all in this together and implicated universally. This universalizing of the human predicament neglects to acknowledge the extent of diversity in the human experience and the ways in which 'wealth, nationality, ethnicity, gender, class and so on mediate the relationships between those groups' (Davies 2016, p. 52). By simplifying the view of the human species, humanity becomes a collective damaging group, a resource-exploiting, over-consuming, capitalist homogeneous collective called 'humans'. It then attaches the 'blame' of a collective ecological crisis squarely on the shoulders of the masses. A preoccupation on limits to growth, overpopulation becomes the means for 'blaming the poor for a crisis to which they have in fact contributed very little' (Davies 2016, p. 53). For the opponents of the Anthropocene concept, the militarization of disaster and the economic financialization of catastrophe through risk management are evidence that the naming of the Anthropocene has the potential to privilege the rich and disadvantage the poor. This advancing of capitalist dominations is evidence that a prerequisite for addressing the Anthropocene would need to start with a rethinking of current forms of capitalist globalization through an engagement in questions of intra-human injustices (Davies 2016) while, at the same time, addressing a newly formed ethics of human, non-human, non-living agency and inter-dependent relations.

This view of a shifting focus from 'humans' to the complexity of being 'worldly with others' was supported by Donna Haraway in a recent interview published in the journal *Ethnos*, where she argued the naming of the Anthropocene constructs a certain model of the globe, a view that 'the contemporary world is a human species act' (Haraway et al. 2015, p. 1). She argues: '[I]n this moment of beginning to get a glimmer of how truly richly complex the world is and always has been, someone has the unmitigated arrogance to name it the Anthropocene' (Haraway et al. 2015, p. 11). Nils Bubandt, responding to Haraway, also acknowledged the

contested nature of the term but added that it has provided the opportunity for a galvanizing in academia:

> [T]he Anthropocene is a polluted concept, it is a contested concept, it is a problematic concept for all kinds of reasons. At the same time, it might still be utilized to do useful work, to galvanize already emergent forms of thinking and acting in academia. For instance, one could claim that it disrupts the global hierarchy of sciences. After all, it comes as an invitation to collaboration from the 'hard sciences', from the apex of the hierarchy of sciences, to the human and social sciences. (2015, p. 14)

This realization of the possibilities and implications of the events foregrounded in the era of the Anthropocene are compelling, and while the concept may still be contested, it evokes in me a desire to consider the enormous challenges this era will present to the collective global community of human and non-human others. Particularly, my focus is on how children (especially those in less-privileged positions) are implicated in these discussions of the Anthropocene. As many more come to recognize the impact of this new epoch, I wonder whether there will be a clarion call to contemplate ways of being, and knowing our everyday co-existence with others; how we engage with the 'planet' and how the 'planet' engages with us. According to Lorimer, the Anthropocene 'represents a very public challenge to the modern understanding of Nature as a pure, singular and stable domain removed from and defined in relation to urban, industrial society' and that '[t]his understanding of Nature has been central to western and environmental thought and practice' (2012, p. 593). And while the death of Nature as we had come to know it, and the proposition of considering a new relationship with the more-than-human world, is not entirely new, the current rise of theoretical work and the potential to reconsider the work I have done in cities around the world with children is.

Entering La Paz

It is this prospect that has drawn me here, back to La Paz two years after my first encounters with children living in the slum communities. My challenge is to consider how to present the voices of children with and through their everyday experiences of the non-human in the debates of the Anthropocene. Acknowledging, as Taylor and Pacini-Ketchabaw (2015, p. 508) do, that children's close encounters with the environment

described through my research may seem 'insignificant, small and ordinary events' on the scale of planetary ethics as 'posed by the Anthropocene'. But like them, I propose that children with the non-human others they occupy the planet with, will inherit and respond to the consequences of a world we have inherently altered through our exploitative human-induced changes. And those who will inherit this uncertain future deserve to be recognized and acknowledged in these critical debates of the Anthropocene.

As I disembark from the plane, my heart starts racing. I take a few deep breaths. I am feeling the first signs of my body adjusting to the high altitude. I am wondering, well hoping, that I won't be affected by altitude sickness, as I have not taken the time to gradually acclimatize, as it is often suggested. I wait anxiously for my luggage to arrive so I can clamber into an old taxi and head down to the city of La Paz. It doesn't arrive, so I have to leave the airport without it. The taxi driver takes me on the shortest but steepest route, down through the fastest urbanizing region of Bolivia, the El Alto, passing over the ridge into Alto Tacagua, a small community at the highest point of La Paz valley, at the point where the houses cascade over the valley. I know this area well; Alto Tacagua is the home of many of our child co-researchers. There is only one road. It winds down the valley like a snake, creating a large arc through the community. The houses teetering high on this escarpment are accessible only through an endless labyrinth of steep staircases. It is still dark; the quiet is unfamiliar in this bustling city. Only the green twinkle of streetlights below me, endlessly floating in the open space, is there to greet me. The white light impacted by the altitude shines green. In years past, this prompted many to name La Paz the emerald city. I may have only dropped 500 metres, but by the time I reach my hotel I can feel my body calming. My heart is beating to a more familiar regular beat. I am breathing slower. Now I climb the stairs and find the room that will be my home and office for the next four weeks.

I lie on my bed thinking back to the children. I smile when I think of Luis, who was 14 years old when I was here before. I am coming back with the hope of speaking to him again. Now at 16, I want to ask him if his life has changed since we last spoke. Two years ago, I had given Luis a camera so he could take photographs of his life up in the valley. A week later, I had visited him and his friends at the local sports field to give him his photographs back. I also interviewed him. After he had a chance to look at his photographs, Luis summoned me to come over, and then he showed me this photograph (Fig. 1.1).

Fig. 1.1 Illimani Mountain (Source: Photograph taken by Luis, age 14, Cotahuma, La Paz)

'I want you to have this one,' he had said. 'It is my favourite. The Illimani mountain is in this photo and a view over the city of La Paz from the El Alto. I can see Illimani from my house. When sunshine hits the snow it fills me with joy.' He then pauses for a moment and closes his eyes. 'My dream though is to live far, far, away from the city and my mountain, to be in the country where there are trees and fresh air where it is clean and safe' (Fig. 1.2).

He then drew a picture of his dream place for me and explained:

> My favourite place is the country because it is peaceful and open, the places are beautiful there. This is the house where I can live in the country. The view from the hills, you can see everything. I like it because there are many rivers and fish.

When Luis dreams of moving back to the countryside of Bolivia, where many of his family members still live, his life is representative of a rural-to-urban movement that is well established in our rapidly urbanizing world.

Fig. 1.2 My imagined dream place (Source: Drawing by Luis, aged 14, Cotahuma, La Paz)

Sixty million people in the developing world are leaving the countryside every year. For the first time in human history, more people live in urban than rural areas and city populations are growing by more than 200,000 new inhabitants each day. As people continue to migrate, the numbers of people living in slums, shantytowns and informal settlements rise steeply. Just over one billion people currently live in slums, one in seven people on the planet (source needed). Most come to the city holding onto a dream of a better life—more schools for their children, healthcare, jobs—to move out of their poverty. City life in cities like La Paz can come as a mixed blessing for children like Luis. The sense of deprivation and disappointment can be multiplied as they are so close to the opulence of modern society, yet so far from enjoying it. Luis and his friends are exposed to a range of risks in their precarious environment: polluted air, dirty water, traffic accidents, flooding, potential landslides, forest degradation, the impact of lack of sanitation and the stench of garbage surrounding their homes. For these children, surviving till age five is a major milestone, and the dream of a better life is often a privilege. The research activities conducted with the children by my team of newly graduated students from the department of social work at the University of San Andres in La Paz

have been documenting the children's lives of growing up in La Paz. Through their everyday encounters of being with others, our intention was to be influential with city council officials so they could create, for the first time, a children's plan for the city.

There is also something more personal that connects me to Luis and other children who live in these challenging communities. Like Luis, as a child I also had dreams for a different world. A world where I would be safe and where I could exist with the animals and the plants who shared my environment. Like many of the children I have met around the world, I had a special place in my neighbourhood, a place where I escaped the challenges of a difficult life. This was a place where I could quietly ponder my connection with the world around me. The birds, lizards and plants had become my friends. They shared these quiet spaces with me; communicated with me; only they knew my inner secrets. When I moved away, they stayed with me in my dreams.

Sitting on the rock
I can hear the breeze
playing on the leaves in the trees
The sound of water trickles through my thoughts and dreams
Is that a blue wren in the distance I can hear?
Wren will you be singing here again tomorrow?
or is your life so filled with sorrow
since they choked the sky with smoke and took away your home?
The silence is so easy
Hiding in the shadows of history
time stands still when I am here
It is my special place
Nobody knows I am here
Nobody knows where I go
But special place will you always be here?
Do you quietly fear .....
as I do?
That in years to come the shadows will be gone
and only memories will stand in this place.
Karen Malone, March 1978, age 15

So how did I, a girl who grew up in a poor housing estate in the outer suburbs of Melbourne, come to be here in this place, in the highest attitude capital city in the world, with Luis and his friends discussing his dreams and aspirations to live a different way to be connected to Mother

Earth? As a means of locating the book in my own research genealogy I will answer this question through a narrative identified as a series of epistemological and methodological 'turns': a re-turning over and over of my research journeys.

I am borrowing from Barad (2014) this notion of a 'turn':

> by re-turning – not by returning as in reflecting on or going back to a past that was, but re-turning as in turning it over and over again – iteratively intra-acting, re-diffracting, diffracting anew, in the making of new temporalities (spacetimematterings), new diffraction patterns. (2014, p. 168)

Barad (2014) attributes the notion of diffraction as evolving from feminist theorizing and the science discipline of physics, both seeking to deepen understandings about difference differently. Diffraction is a useful and troubling process, and unlike the idea of reflecting on my stories (as I would have done in the past), I am seeing who I am as entangled, in the here and now. 'Diffraction is not a set pattern, but rather an iterative (re) configuring of patterns of differentiating-entangling. As such, there is no moving beyond, no leaving the "old" behind. There is no absolute boundary between here-now and there-then' (Barad 2014, p. 168). I start with writing and researching in a 'critical' environmental activist turn. It was over 20 years ago, during my doctorate research, that for the first time I came to be collaborating with a community and its children who were experiencing the impacts of a mounting environmental crisis: the implications of an advancing Anthropocentric world. I felt at a loss over the vulnerability of children in this city environment, a city that had been a place where my own children played in well-manicured 'natured' playgrounds, in safe suburban streets, now revealed itself to be a place where children were exposed to pollution, toxic contamination and dangers. The term Anthropocene hadn't been introduced into the nomenclature of the environmental crisis, but the sense of foreboding and its implications for the planet were already being revealed to me through the everyday lives of those most vulnerable to it.

A 'Critical' Activist Turn

Although there were large expanses of vacant land owned by the government or industry, in Laverton they had lain idle for years and had, through neglect, become an eyesore (Fig. 1.3). There were few parks or playgrounds

Fig. 1.3 Offensive industries creeping up to the housing estate buffer zones, Laverton Park Housing Estate, Melbourne, Australia (Source: Photograph taken by the author)

with the only substantial area of public open space being McCormack Park. Local residents and educators describe the issues like this:

> "It is a bit late; we are surrounded by industry polluting all the area so bad that children occasionally come home from school with hands on their mouths to try to breathe", "Living close to industry can become very depressing, especially on windless nights when the stench of industrial fumes permeate the air." "The EPA say the industry doesn't put out emissions but when I wake up in the morning and my washing on the line is covered with smelly thick soot – I question that" "Children at this school suffer at a much higher rate than normal asthma, learning problems and constant general sickness".

A teacher in the local public school describing it to me stated:

> The general impression is that Laverton Park is the slums. People have deep sympathy for you if you say you work at Laverton Park. It's very hard, it's just an attitude people have. I just wonder if the kids don't take on that

> identity too, certainly the parents feel guilty that the children get so sick from the industry but many of them have no choice they can't afford to live anywhere else.

After my first days of visiting the school, I went home and wrote in my researcher's journal the following reflection. It revealed the very personal impact of being in the community:

> When I was a child I spent my first years living in a housing commission estate built at around the same time as Laverton Park. The school I attended was built from the same grey mortar bricks and the houses built in the same prosaic design. When I wandered around the school grounds today at Laverton Park I was constantly reminded of my past. I tried to recall how being in the school and living on a housing estate felt as a child.

The focus of the community environmental programme being supported through the local primary school was to alter the power relationship that existed between the community and city authorities—to provide the space for the communities' silenced voices to be heard. It meant supporting the community to perceive themselves not as mere objects of their social conditions but active creators and narrators of their own lives. This had just started when I entered the community. I could tell from my first community meeting that the community, children and the adults felt powerless and silenced. This, they told me, was a consequence of them being 'poor', having no political clout, no social status, easy to ignore. They had come to accept that this was the way life was. It was their destiny, their lot in life, their cross to bear. When I saw the principal of the school during my first visits, I asked him to describe the community programme. This is what he had said:

> It was about developing a system of values for life – that you have the right and ability to change your world, change your society, that you can influence it. A lot of children and adults from this community don't believe they have the ability or right to do that. We're trying to set up something where the community would in every real sense own it and make it, would drive it and lead it to wherever it goes – empowering people to change society.

When I first started teaching and researching at Laverton, the children and the community, seemed extremely apathetic about the degraded environment. Rubbish lay on the streets, there were no trees in the park, and the creek lay dead and dormant, winding through the housing estate like a snake ready at any time to spit some torrid poison. When I left three

years later, the children with teachers and the community had planted over 10,000 trees in the park, cleaned up the rubbish, placed oxygenation ponds in the river, had devised enough water quality data to convince the Environmental Protection Authority (EPA) to fine a number of offensive industries that then placed filters on their discharge pipes. With the community I had watched the world around the neighbourhood change. They made it change, through new imaginings where they reconstructed themselves as a scientist, arborist, activist, anthropologist and mostly as educators (Fig. 1.4).

Fig. 1.4 10,000 trees later… Laverton Park Housing Estate, Melbourne, Australia, 1996, 2016 (Source: Photograph taken by the author)

I remember one morning just before I left the school for the final day, one of the children came running into the classroom, out of breath, agitated, seemingly distressed. This normally would have set off alarm bells that something terrible may have happened at home. But when I calmed her down enough so she could speak, she said: 'I found a frog, I found a frog in my pond, I found a frog, our river is alive.'

This research taught me a lot about the importance of listening, really listening closely, to the community, children and adults, about their lives. I learnt the importance of documenting and valuing the diversity of people's lived experiences of a place, and the importance that 'place' as a form of being 'located in place', had for bringing people together to share their everyday lives. It was also here that I came to realize that influencing government, and setting into motion real changes, whether it was auditing pollution from offensive industry, planting trees, cleaning up waterways, or creating social policy, needed evidence, and only by influencing political processes could you really practically improve people's lives. It also taught me a lesson in human rights, that it was the right of every person on the planet, no matter where they were born, their family situation, gender, ethnicity, class, social status, to the same quality of life, the same potential future—it wasn't just their cross to bear, it was a cross we all needed to bear on their behalf. It also revealed to me the importance children placed on those encounters and relations with their place. Even though I did not notice or give attention to the non-human entities travelling in that research journey with us, I look back now and realize they were there. And just like in my childhood special place, and Luis with his Mt Illimani, these children also realized the value of having 'their place', as a place of refuge. For the first time I began to explore my own researcher subjectivity and the difficulties of moving inside and outside the children's world:

> As an outsider I will attempt to catch glimpses of this complex world from which these children evolve. As an outsider I realize that this can only be superficial. Like many of the teachers who work in the school, when the school bell rings at the end of the day I drive to my own place, far away from the smoke stacks, the freeway and the struggles. (Personal Journal entry September 1993)

In this study at Laverton, I used critical theory, theories of false consciousness, hegemony, governmentality and false illusions. I explored the impact of social stratification and the relationship between structure,

power and agency. My intention was to support community to reclaim their identity and voice and to identify how and where the power of their oppression was specifically located. Methodologically, while I was adopting an ethnographic stance, I also shared a role with the community in their activist processes, where they took up what Gramsci would term the role of the 'organic intellectual'. I was also introduced to participatory research as a way to work collaboratively with community, to help support them to be active in transforming their situation through research. Participatory research acted both as a methodology and a theoretical framework with everyday people taking on the role as researchers in pursuit of answers to the questions of their daily struggles. The research theoretically sought to find the means for exposing the myth of neutrality and objectivity and emphasized the principles of subjectivity. The everyday lived experience of 'forgotten classes' being in the world negotiating power with the most dominant, while all the time seeking to construct counter-hegemonic discourses that reveal the false illusions that sought to maintain oppression and silence. The methodology was based on the belief that ordinary people, including children, were capable of understanding, documenting and changing their reality. It was also my first experience of the impacts of the Anthropocene on children and their innate desire to be in relation with the planet.

A 'Cultural Sociological Turn'

The second methodological and theoretical turn in my research story was the 'cultural, geographical and sociological turn'. This began while researching once again a community in the western suburbs of Melbourne, Australia, in the role of a postdoctoral fellow with the United Nations on a project called *Growing up in Cities*.[1] As an eight-country study replicating the work of eminent urban planner Kevin Lynch from the 1970s and directed by Louise Chawla, this project was my first entry into exploring a multi-disciplinary, multi-method approach to research that focused on working directly with just children as our co-researchers in the study of 'places'. All sites in the study were on children living in the most disadvantaged neighbourhoods of the cities. The international team of academic researchers were cross-disciplinary: urban planners, environmental psychologists, architects, anthropologists, geographers and myself, the only education/social science researcher on the team. One aim of the study was to develop results representing the diversity of children's experiences

including, where possible, longitudinal comparisons. The project developed into a book of case studies on children's lives where the first ever set of qualitative indicators of environmental quality devised by children were produced (Chawla 2002). The methodological aim of the project was to devise a model of children's participatory research that would be generative and culturally sensitive. The audience of the research was UNESCO and UNICEF in particular, but other UN agencies could also use it to collect qualitative data with children in order to represent the fine-grain differences and experiences of children's everyday lives across a variety of neighbourhoods in cities (Driskell 2002).

After the Growing up in Cities project was completed, I continued to work with UNICEF on their Child-Friendly Cities international project.[2] Building on my previous child-focused studies, I continued to refine with others the development of a place-based participatory research approach for researching with children. At the time I was also conceptualizing new ways of exploring the data with emerging theories from human and cultural geography, globalization, postcolonial theory and the new sociology of childhood. These research studies were located with disadvantaged communities in city and rural villages in Papua New Guinea, a number of Pacific Islander communities and with HIV-AIDS orphaned children in South Africa. Additionally, I worked alongside colleagues in city and suburban sites within Tokyo and across Japan and numerous inner city and suburban neighbourhoods of Melbourne and Sydney. I called this my cultural, geographical and sociological turn, because it was during this time that sociocultural theory and geographical theories (inclusion/exclusion and affordance theory) meet with place-based studies to take on a central role in my reading of children's lives. Like another participant in the children's stories, it (place, geography, culture) wrote itself into my storylines with such vengeance it was often hard to see outside of the thickness of the rich descriptions of children as cultural and social beings. Take for example a short extract from my research journal after engaging in participatory research with children in the Cook Islands:

> Their experience of childhood, while personally unique, can be understood as a cultural entity, a collective rather than an individualised journey in the process of being a child and growing up. Their stories weave threads of a collective concern about the need to have a voice, to move out from the periphery and into the centre of their island life. And while I have attempted to provide a construction of island childhood – one which demonstrates the

> cultural autonomy of childhood and children's identity from adult island society – I am also aware that to universalise their life would be to overlook that their culture of childhood is situated within and alongside, rather than outside, the intimate and unique world of islander adults.

Often this work with children in a host of unique locations was very personal. A human rights submission to save the Motu Koitaba city village in Port Moresby put me in opposition to the government, which decided they could not ensure my safety when moving around the city. With my research colleague, I elected to sleep in the village on the wooden floor of an elder's hut. The toilet was a hole in the pier, mosquitos buzzed inside netting and the young rascals who were in opposition to the government took over as our security patrol. More recently, I have been again challenged with my own middle-class white privileged life when in the eastern cities of Kazakhstan my throat stung so much from acrid toxins in the air that I could hardly breathe. Or while in the western city of Aktau, I was reminded by the children that the nuclear reactor on the outskirts of the town was so old it had been condemned. 'Did you know?' they asked me. But at these times I would always remind myself, as I did when working in Laverton all those years ago, that unlike the children, when the research was over I could go back to my safe home. Throughout this 'cultural, geographical and sociological turn', I continued to explore the lived experience of my own subjectivity as a researcher. I was guided by the sentiments of writers like Michael Jackson (1989, p. 2) when he wrote: 'Lived experience accommodates our shifting sense of ourselves as subjects and as objects, as acting upon and being acted upon by the world, of living with and without certainty of belonging and being estranged' (Fig. 1.5).

When reconfiguring my researcher roles, I found myself seeking to find a close, empathetic position as an insider, yet constantly aware of my power as an outsider. I questioned the impact of these multiple roles in countries where I did not speak the language and was positioned as an 'expert'. I had a great sense of responsibility to the children and their families to make sure their views were listened too, taken seriously and acted on. I was drawing on an 'epistemology of insiderness' that saw life and work entangled, where my life and the life of the communities, especially the children, became entwined in complex relations. The audience of government and especially policymakers put pressure on me to 'represent' data as discreet and clean, that which would be digestible to their needs, rather than my own theoretical explorations.

Fig. 1.5 Industries Eastern Kazakhstan (Source: Photograph taken by the author)

An Emerging 'Posthumanist and Vital Materialist Turn'

This now brings me to my most recent theoretical and methodological 're-turn': an emerging 'posthumanism and vital materialist turn'. This turn supported a shift in focus, from culture as outside of nature, to a reorienting of relations where the human and more-than-human world are recognized as existing in an ecologically collective of 'messy entanglement'. By employing the potential of posthumanist approaches, my theorizing is seeking to critique classic humanism, an approach that emphasizes only the value and agency of humans to the detriment of the agentic potential of the more-than-human world. Through the import of de-centring the human by using new materialist approaches, I am being enticed to question the centrality of the human and to reconsider the way humans relate to, set ourselves outside of and seek to dominate the more-than-human world. Beyond the global crisis, these new ways of considering relations with the planet have important consequences for understanding current debates around children's encounters and

relations with the more-than-human. By reimagining in a vital materialist manner, I am acknowledging 'the intricate web of interrelations that mark the contemporary subjects' relationship to their multiple ecologies, the natural, the social, the physic' (Braidotti 2013, p. 98). I am noticing and attend to the subtle ways 'other objects' (animals, plants, buildings, earth, air) are often disregarded as nothing but aesthetics, the background context of children's lives. A feature of this new ontological perspective is that 'it shifts from conceptions of objects and bodies as occupying distinct and delimited spaces, and instead sees human bodies and all other material, social and abstract entities as relational' and that these 'assemblages of relations develop in un-predicable ways' (Fox and Alldred 2014, p. 401). I explore these new theories in this book by returning to research data from my studies with children in a four-year period between 2012 and 2016. During that time, I was researching for UNICEF, and had worked with four regional and inner city communities of Kazakhstan and three communities in La Paz, Bolivia. Additionally, I have also incorporated data from children in other cities as points of comparison.

My 'posthumanism and vital materialist turn' is evolving, and throughout the book I will be revealing my own struggles to reconcile my desire to be honest and respectful in the reporting of the children's lives in order to inform a political agenda on sustainability that is very limited due to its anthropocentric desires, while all the time considering how to engage in analysis that disrupts anthropocentrism and the exceptionalism of humans. These concerns about the future are particularly important in a country like Bolivia, which is attempting to reconsider development that is not a 'western industrialized model' but, as Félix Cárdenas, Vice Minister of Decolonization in Bolivia, states:

> a new way of living, a new civilizatory paradigm … There are people who think we need to build a form of communitarian socialism, or Andean capitalism. We propose neither one nor the other, but rather to take ourselves as a starting point. The name is not important, but rather what we're after: a new type of society. We want to understand, conceptually, what it is we want as a country. (Rance 2013)

I am hoping the new theoretical tools I bring to my study will do justice in unpacking these alternative ways of considering 'development' and 'sustainability' in Bolivia in particular, because they are based on principles of

harmony with Mother Earth: 'Human activities, within a framework of plurality and diversity, should achieve a dynamic balance with cycles and processes inherent in Mother Earth' (Bolivian Legislative Assembly 2011). As a researcher, in my re-turning to a posthumanist and vital materialist perspective, I am implicated in the ethical choices I am making and how that positions me politically. In this story, I am acknowledging that I am entangled in relations with the planet in a way that a mere unpacking of my cultural self or my social self won't reveal. I am seeking to move, ontologically, from identifying bodies (human and non-human) as separate entities with distinct borders, to think instead of assemblages and interdependences. I am inspired by the possibility of an embodied engagement with the materiality of my research: a *becoming with the data* as researcher. I am considering new ways of making meaning from my research that will invite uneasiness, messiness and complexity rather than reassurance and comfort through romantic humanist childhood imaginings. In the era of Anthropocene, where the human has positioned itself outside of the non-human, I am desiring to disrupt dominant discourses. Discourses that embed me so deeply in my human dreaming of the Cartesian modernist divide that I find it difficult to find my way out and trace my own worldly relations or harness the creativity of a child's collective ecological potential.

Re-turning to La Paz

During my first night back in La Paz, the familiar sound of gunshots (or fireworks) rings out through the dead of the night, keeping me awake in my small attic hotel room. I knew I was arriving close to the October elections, and I had noticed messages scrawled in graffiti throughout the streets on my way down from the airport: '*Evo hasta 2020*' ('Evo until 2020'). The shots or fireworks were likely to be connected to street protesters. The streets are constantly the site of some active political fervour, those for or those against, all in the mix. As the sun rises, I hear a hum outside my window. I look out and am surprised to see the slow-moving form of a gondola coming to life above me. I open the window just to check I am not imagining it. It isn't totally a shock. There had been discussions two years ago by the government about the possibilities of a new twenty-first-century transport system used as an alternative to the crowded unreliable minibuses. But it had been hard to imagine a gondola system stretching from the heights of the slum communities of El Alto to the

Fig. 1.6 Life with the new Teleferico (Source: Photograph taken by the author)

upper-class neighbourhoods way down in the valley of Zona Sur. Although gondola technology has been around for a long time, the concept of using it as a mass transport system is new, especially within a low-income nation, in a city like La Paz. But there it was, sparkling new, moving past my window, filled to the brim with waving school children and smiling Cholitas. What an achievement in two years! I later found out that day, it wasn't the only one, there were three. It felt like an apt metaphor for the transformation of an ancient landscape to a postmodern city, my new posthumanist return grinding to life as the sun rises outside my window (Fig. 1.6).

Grappling in the Anthropocene

Throughout the book I will be incorporating a variety of theoretical and methodological perspectives, in particular place theory for methodology and posthumanist and vital/new materialist approaches in conceptualizing data. I have adopted these approaches in order to provide a compass to the writing where I can, 'navigate across the stormy waters of the postanthropocentric predicament' (Braidotti 2013, pp. 86–7) while allowing me to

question forms of humanism and materialism that have emphasized the value and agency of human beings to the detriment of the agentic potential of other objects present with us and part of the more-than-human world. I will be drawing on the issues of a planetary crisis as epitomized in our shared anthropocentric predicament to explore how children entangled with place, nature, animals, disaster and the mattering of the non-human world come to view their everyday experiences (Braidotti 2013). Through these discussions, I will focus on the most vulnerable children in the city: those living in slums and disadvantaged or marginal communities. In particular, I will be focusing on children growing up in urban environments in Bolivia and Kazakhstan.

Rather than a fine-tuned analysis, I intend to share with the reader my grapplings when applying these new approaches to theorizing my research. By doing this work, I have moved away from generalizations and assumptions that have often universalized children's environmental experiences, and I provide a glimpse of the complexity of urban environments and the possibilities and impossibilities for sustainability discourses as they currently exist. Throughout the book, I will be considering a reimagining of the transitional potential for a posthumanist theorizing of children and sustainability as means for revealing the entangled complexity of human–non-human relations. That is, I am asking myself could there be possibilities for new imaginings that could be a catalyst for enacting new ontological epistemologies that allow humans to re-think, to re-know what it means to be in/as ecological community with the more-than-human world? To perform this work, I am considering the potential of ecological posthumanist approaches for questioning binaries such as human/nature and subject/object.

I will, through visual, mobile and oral methods, including children's interviews, photographs, maps and drawings, explore the places where children live, their connections to the more-than-human world, the challenges of the impending environmental crisis and its impact on their bodies, lives and non-human relations. At times they will also offer potential ways to consider their own imagined future. This research is founded on an ethical and caring relation with children as co-researchers, and supports opportunities for children to work as partners with humans and non-human others in reimagining a new way of being with the planet. These place-based methodologies in my research work—walking, talking and making methods—have supported the construction of the series of ecological posthumanist narratives embedded in the five chapters on nature,

mobilities, animals, porosity and disasters. I am recalling these ecological posthumanist narratives of child–non-human–city encounters to consider the importance of applying methodologies that are open and incomplete (Rautio 2014). I seek, through these stories, to engage with complexity rather than to develop simple categories or themes that close down or eliminate that which doesn't sit comfortably with an idealized or romantic view of the child in the city. The data do not fit into neat categories of certainty with some absolute closure; rather I want to explore possibilities where the 'complexity and open-endedness of phenomena' are not sacrificed (Rautio 2014, p. 464). As Haraway (2015) insists, if we are to imagine and nurture rich multi-species assemblages and new ways of being with the planet, then 'we need stories (and theories) that are just big enough to gather up the complexities and keep the edges open and greedy for surprising new and old connections' (Haraway 2015, p. 160).

The central challenge I set when writing this book was to be attentive to children's experiences of being with the planet, particularly children in Bolivia and Kazakhstan. Firstly, because I believe we have much to learn from children about the differences in everyday encounters they have of their cities and those other humans they co-inhabit these environments, namely adults. Secondly, I am challenged to consider how deep encounters of child bodies as an assemblage of nature–cultures through the mattering of matter in time, space and at a molecular level are vital. Finally, I am struggling to conceive what it would mean not to listen to children, particularly those who are most impacted by global changes such as climate change, about their imagining for a future planet, when they have the most to lose.

Notes

1. The influence of the UNESCO Growing Up in Cities on the field of children's environments particularly in terms of methodologically is explored in some more detail in Chap. 2.
2. UNICEF Child-Friendly Cities is discussed further in Chap. 2.

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CHAPTER 2

Stories That Matter

Donna Haraway (2011) reminds us that the stories we choose and write to tie our stories together help us make sense of our worlds, and that these stories matter.

> It matters what matters we use to think other matters with;
> It matters what stories we tell to tell other stories with;
> It matters what knots knot knots, what thoughts think thoughts, what ties tie ties.
> It matters what stories make worlds, what worlds make stories. (Donna Haraway 2011, p. 4)

Throughout the past 20 years, I have listened intently to children's stories by noticing and paying attention to their experiences on being in relation with others (human and non-human), in their local environments. These children were as young as 5 and up to 15 years. The research was both ethnographic and participatory in its methodology. As a feminist onto-ethnographer, I have inserted myself in the studies (and in the writing of the book) by documenting my experiences through a field diary, photographs and videos. The place-based participatory research was with the children and their companions. The children volunteered to be co-researchers with me engaging in a collection of visual, oral and mobile place-based research tools. These tools included interviews, focus groups, drawings, photography, mapping and walking interviews. Through these methods, an abundance of rich, descriptive and visual data of how children

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experience their place and their imaginings for the planet were collected. In this chapter, I will outline the history place-based participatory research work children in cities that stems back to the 1970s with the work of Kevin Lynch in the 'Growing Up in Cities' project. This work continued throughout my work with UNICEF on child friendliness of cities, and at deeper level recently on the collective accounts of children's environments with a number of feminist poststructuralist scholars.

Some of these past discussions have focused on the paradigmatic shifts when repositioning children from merely passive objects of research to being implicated 'in knowledge production and the extent to which children are constructed as knowing subjects' (Balen et al. 2006, p. 31) to being attentive to children as 'epistemologically privileged in that they are better placed than adults to produce situated knowledge … of their everyday experience' (Balen et al. 2006, p. 32). I am resisting past notions of the agentic child as it has simple humanist desires in my thinking. I am shifting my thinking away from a view of agency that implies agency you can hold or be given to the detriment of another being who may not be given any and therefore has little or none. In contrast, I am considering agency in the way Barad (2007) speaks of it as an enactment, a matter of possibilities for reconfiguring entanglements, worldly reconfigurings. To rethink of agency as central to a relational ontology, it possesses possibilities for not localizing agency in the human subject, not being possessed by humans or non-humans but distributed across an assemblage of humans and non-humans. In this chapter, I will explore the role of children as co-researchers and the means through which multi-method designs have contributed to creating flexible and equitable contexts for children's role as meaning makers. Negotiating power relationships between adults and children is also unpacked in order to reveal some of its complexities, with an acknowledgement that listening, being present, with children is central to real understanding. Bronwyn Davies (2014) notes that careful listening with children can lead to emergent mattering, a way of engaging in community and the world, where 're-configuring that world as a place where self and other matter, and make a difference, to each other and with each other' (p. 12).

Child as Co-researchers

Children have been latecomers in the field of research participation and the purview of human rights. This has been largely due to the fact that most cultures did not, and many still do not, recognize children's status as fully realized 'human beings'; rather they are seen as 'human be-comings'.

The dominant paradigms on the study of children in the past have traditionally been psychological with research about children deeply embedded in positivist traditions. Decisions regarding children have been largely left to the adults, who feel they are capable of taking into account the best interests of the child through their own history, perceptions and experiences of being a 'child' (not quite fully human). 'Speaking for' children by human adults is not unlike the anthropocentric role of humans speaking on behalf of the planet and all of its beings.

Recently, a paradigmatic shift whereby children were recognized as capable social agents, shaping as well as being shaped by their circumstances, allotted them potential to be social actors to take up 'agency' (James, Jenks et al. 1998; Wyness 2000; Danby and Farrell 2004) to speak for themselves. Danby and Farrell (2004) describe the agentic child as a capable and competent agent who replicates and appropriates aspects of their being through their talk and interaction with others, thereby actively participating in the construction of their own relations. Contemporary theories in the past that supported in the new sociology of childhood strongly advocated a view of children as social agents, 'active in the construction and determination of their own lives' (James and Prout 2008, p. 8). However, this is mostly within the confines of an adult constituted potentiality. Being acknowledged as an active agent allowed children's collective action to be recognized as the creative appropriating of information and knowledge influencing the adult world, while they were also producing and participating in their own peer culture outside of the domain of adults. Therefore, recognizing children's agency was located in their everyday lives:

> Rather than romanticizing children's agency, we need to start from the basic assumption that children are of the social world and are, in a number of complex and not always readily visible ways, socially competent. (Wyness 2006, p. 237)

Much research before the introduction of the child rights agenda and the new sociology of childhood, notably within positivist psychological paradigms, was carried out *on* children and based on the assumption that children, compared to adults, were incompetent and unreliable narrators of their life experiences and, in this way, developmentally incomplete. Commonly, the adult researcher's stance was that of the detached observer and the child as the object of the research. This approach of research on children was supported by a view that children lacked capacity to

comprehend such abstract activities as research (Darbyshire et al. 2005), and the most appropriate way to find out children needs was to seek 'proxy information' from significant others.

Supported by a shifting paradigmatic position that framed children and childhood as being constituted outside of 'adult', new approaches to represent children more authentically and for research to be more applicable to their social needs instigated a focus on talking directly with children: 'I argue that that the best people to provide information on the child's perspective, actions and attitudes are children themselves' (Scott 2000, p. 99). Focusing on authentic and meaningful children's participation in research, this style of research came to be known as research *with* children. For many child researchers, researching *with* children provides the opportunity to relocate the child as knowledge-able, to alter the balance of adult–child power relations and allow the research to be a catalyst for transformative social actions. Blaise talked of this intimately in her study of gender with preschool children:

> As praxis-oriented work or an act of consciousness-raising, this study was designed to turn critical thought into social action and as such has special and important relevance to the work of teachers and researchers who want to systematically interrogate and scrutinize their practices. This way of teaching and researching attempts to disrupt children's existing practices. For example, instead of going into the classroom and researching *on* or *about* children, this inquiry is about researching with them. Additionally, researching *with* children provides opportunities to intervene or disrupt inequitable power relations that exist. (Bliase 2005, p. 46)

Researching *with* children insists the researcher consider appropriate methods in order to authentically involve children as co-researchers. The growing base of evidence on the valuable role of children as researchers in transformative urban planning projects evolved with projects such as UNESCO Growing Up in Cities project and UNICEF Child Friendly Cities Initiatives (Moore 1986; Hart 1997; Matthews 1992; Chawla 2002; Francis and Lorenzo 2006) using a participatory action research model.

Participatory Action Research Models

The UNESCO Growing Up in Cities project used a model of participatory action research involving children and young people, in collaboration with adults, to support children to evaluate the quality of their

urban environments in a number of cities around the world. The aim was to engage children to identify what and how a city supported their needs and help them to identify ways to improve the city. The project was initiated in the 1970s by Kevin Lynch (1977), an urban designer and advocacy planner who coordinated the first project locations under the sponsorship of UNESCO in four countries: Argentina, Australia, Mexico and Poland. In 1995, the project was revived and implemented in eight countries with the support of UNESCO, Childwatch International, the Norwegian Centre for Child Research and other sponsoring organizations. The project included revisiting cities from Lynch's original project and including new sites to ensure a more representative case of the range of global diversity in children's lives. Cities in the new study included the historical port neighbourhood of La Boca-Barracas in Buenos Aires, Argentina; a low-income public housing site in the western suburbs of Melbourne, Australia; a peri-urban slum in Bangalore, India; the Nordic city of Trondheim in Norway, an immigrant Hispanic neighbourhood in Oakland, United States; the working-class district of Powiśle, Warsaw, Poland; a squatter camp in the city of Johannesburg, South Africa; and the English midlands city of Northampton, United Kingdom. The research at these new sites pursued three main goals: 'to collect information about young people's contemporary urban experience; to develop models of participatory urban planning with children and youth; and to compare the projects present and past results' (Chawla 2002, p. 29). This new re-visitation of the project has been described extensively in the two landmark publications: Chawla (2002) and Driskell (2002).

Based on a participatory research methodology, the main outcome from the project was a core set of research tools (named the toolkit). Using the research tools, child participants were invited to engage in a variety of activities, including interviews, drawings of their area, small group discussions, child-led neighbourhood walks (walking interviews) and child-taken photographs and commentaries (photovoice). Participants were both genders and aged from 5 to 15 years old. Researchers embedded the child's data in the city by documenting each location's history, geography, economy and demographics; observed the roles that children played in local public life and talked with parents, community leaders and urban officials about their views of how the city functioned for its children. Wherever possible, the information derived from these research activities with children was then used as the basis for implementing actions to

improve urban environments for young people and to design more child-sensitive urban policies. Where possible, researchers also worked closely with city officials and local community organizations to ensure that the rights of children were being addressed and strategies for sustaining young people's input into their city were devised.

Throughout the many years of its implementation, 'Growing Up in Cities' gathered a vast amount of data about how children from a number of diverse city environments used and evaluated the quality of their cities. The intention was never to provide broad generalizations that could be applied across the world in terms of children's urban experiences but to acknowledge the complexity of children's lives and how these complexities had similarities and differences according to where children lived and the context of their local neighbourhood. The project did though produce a set of child-based indicators of environmental quality that prioritized children's judgements on what promoted or hindered their positivity about the places where they lived. The analysis of data from the projects in all cities and countries revealed that young people came to know and express their understandings of how social and physical attributes of a place acted on them and their potential to feel fulfilled. It was also noted that the child-based indicators fell along the positive and negative binaries of four place identity or place attachment dimensions: from 'exclusion to integration, stigma to positive status, fear to security, and boredom to engagement' (Chawla 2002, p. 230). Additionally, an analysis of the data across the eight cities identified that the values expressed by the children were congruent with models of sustainability that were being expressed at this time (Chawla 2002). Children in these early projects also identified the importance of relations with animals and the natural environment as part of their overall city experience. At that time, these data were used for 'setting the scene' and were not unpacked to reveal any deeper understandings about the cohabitation of children with other species (Chawla and Malone 2003).

Although based primarily in the paradigmatic nexus between positivism and post-positivism traditions in the interdisciplinary fields of environmental psychology, urban planning, geography and landscape architecture, this project formed my foundations for a critical place-based inquiry in children's environments research that was influential in shaping my research with children in urban environments for a number of decades. During this participatory work, my own evolving

post-positivist place-based research paradigm for research *by* children was established.

Post-positivist Research with Children

Post-positivist place-based research inquiry uses a variety of methods and can include qualitative research activities that can be designed around participatory research or ethnographic styles of case studies and narratives (Malone 2006; Tuck and McKenzie 2015). Post-positivists believe that human knowledge is based not on unchallengeable truths existing outside of people but rather upon human experience and is influenced by the bias and subjectivity of the participants and the researcher engaging in the world. There are a number of methods and approaches that fit within the post-positivist paradigm—they are generally known as qualitative approaches. For post-positivists, unlike positivists, the social world is not just 'out there' waiting to be interpreted, but 'in here' or 'in us'—it is our interpretation of our everyday experiences and encounters of being in the world. Post-positivists argue that, rather than simply perceiving our particular social and material circumstances, each person continually makes sense of them within a cultural framework of socially constructed and shared meanings, and that our interpretations of the world influence our behaviour in it. Place-based research using post-positivists methodologies supports the view humans are continually creating and re-creating their world as a dynamic meaning system, that is, one which changes over time and is located in 'place'. As active participants in the world, they are making sense of their circumstances, by continually negotiating with others the meanings of their own actions and circumstances and how they are shaping others, and of how the actions and circumstances of others are shaping them. From a posthumanist standpoint, this incorporates negotiating the actions and intra-actions of humans with the non-human world. Key characteristics of post-positivism are qualitative research designs and methods such as research interviews, group discussions, observation and reflection, field notes, various texts, pictures, and other materials and artefacts. The focus of the data collection is to provide mostly descriptive, rich data that are socially and contextually located.

With place-based research methodologies, where children are positioned as co-researchers, children have the opportunity to be involved in all stages of the study including the research design, data collection, data

analysis, reporting and taking action (Malone 2006; Marr and Malone 2007). These types of participatory place-based research methodologies promote children to be active knowledge producers rather than passive knowledge consumers and support children to intra-act with others to be a catalyst for collective meaning making. The research design is flexible and varied and responds to the specific context of the research, the children's choices and profile, 'place' characteristics and the desired outcomes. It moves away from a universal approach to children's research roles and creates a responsive and organic process where children can be or become research active through their encounters and intra-actions with the world. It is often a messy and spontaneous process where documentation is not prescribed but evolves as a response to the 'process'. Adjusting, manipulating and appropriating tools and technology help to allow for these responsive encounters. To be open to the differences indicates a positive openness to difference. The difference in this way of researching is because I am 'no longer interested in defining an organism or body by its limitation, separateness or form' (Hultman and Lenz Taguchi 2010, p. 540). I am looking for 'what emerges in-between and each agent's capacities for affecting and being affected in relation to other organisms/bodies in the world' (2010, p. 540).

Responding to Messy Research Relations

To be responsive, place-based research by children is attentive to noticing the fine-grain differences and similarities, and it seeks to encourage complexity rather than simplicity. When engaging with children in precarious environments, this responsiveness supports opportunities for children from a variety of ages and genders, diverse lives, interests and experiences to take up and make choices of their responses to the possibilities that exist to engage with the research. In Bolivia and Kazakhstan, where the children were mostly located for this book, place-based participatory research children's ages ranged from around 4 years to 15 years old. Children with diverse learning styles, varied abilities or different literacy skills engaged in an array of visual, oral and mobile methods drawing on their own capacities. Darbyshire et al. (2005), reflecting on their experiences of participatory studies with young children, wrote:

> Research demands flexibility and creativity both on the part of the researchers and their 'data collection' approaches. Such flexibility is, we contend, not

> methodologically sloppy, but an important element of a research relationship with children. We had to modify and adapt elements of the study as it progressed in light of the children's responses. (Darbyshire, MacDougall and Schiller, p. 428)

According to Evans (2013), visual participatory tools in particular have become popular in studies with children because such methods respect a diversity of children's agentic capacities. While supported by many child-focused research advocates, there have been concerns expressed by some researchers 'about the increasing dominance of "participatory" approaches to research involving children, and the uncritical ways in which they are often deployed' (Gallacher and Gallagher 2008, p. 499). White and Choudhury (2007, p. 538), for example, have concerns that participatory research projects may 'reproduce the patterns of exclusion in wider society – by age, class, gender, and (dis)ability', creating a small group of 'over-empowered' or expert individuals (White and Choudhury 2007, p. 543). To overcome these limits, it is important to ensure the child researchers are representative of the diversity of 'childhoods' and that researchers do not rely on one-off tokenistic activities with 'expert' children. Evans (2013) also notes additional challenges when implementing place-based participatory research. Some of these challenges include the numerous roles the researcher needs to play and the commitment required when working in an inclusive and respectful way with a diverse ecological community.

In Bolivian life, and in many of the cities where I have conducted my research, a culture of respect for children's agentic rights and subjectivities does not yet exist, or is still evolving. Children's freedom to participate is also inequitable, not because researchers didn't attempt strategies to be inclusive but because children's independence in the neighbourhood was very gendered. Most parents were very guarded about the role of young girls in the project because they had domestic carer roles to perform. Male children had a lot more capacity to be free to move around as they wished and use their non-schooling time to engage in the types of outdoor neighbourhood practices that allowed for rich neighbourhood encounters. Female children's 'free' time in contrast was limited by their obligations to fulfil domestic roles including caring for younger siblings, preparing meals, cleaning and fetching water. While these gender issues are discussed throughout the data, and strategies to support their engagement in the

research were enacted where possible by myself and research team members, the females were often negotiating a series of complex familial power relationships that altered their research encounters. Some of the strategies used to support the females included providing spaces for the younger children to be cared for in the communal space of the research workshops and organizing flexibility around times and places for participation that were convenient to the females. For instance, many of the children asked if the workshop times could be changed in order for them to go home after school, complete domestic chores and then return to participate.

For some communities in La Paz and Kazakhstan, the children's research workshop included opportunities for families to be involved. Parents or grandparents, brothers, sisters or cousins, especially in the beginning, came along to watch, ask questions and even help out. Ethical considerations of negotiating children involvement meant working in outreach children's centres in the community where months in advance social work students had provided information workshops and small meetings for children and their parents. While child, family and community interest in the projects varied in neighbourhoods and cities, central to the participatory methodology was a commitment to being flexible and open and allowing the process to evolve with and through the rhythm of children's lives.

Producing Polyvocality

> No single method can guarantee successful representation in itself. Reflexive research however accepts the messiness, ambiguity, polyvocality, non-factuality and multi-layered nature of meaning in 'stories' that research produces. (Spyrou 2011, p. 162)

Incorporating a research perspective through their everyday experiences of being curious, creative and playful in their place meant exploring a range of possibilities for children to document these relational encounters. The methods included in the place-based participatory research design that I have been using with children in these studies are not 'academic' methods modified for children but child-focused methods organized loosely on research activities combined with activities children use to experience their world. The studies intentionally problematized the 'institutionalization' of children's research participation that commonly occurs in research projects where the focus is on 'training' children in formal research methods (such is evident in the work of Kellett 2005). The

essential premise of the researcher-in-training model used in some children as co-researchers designs is that in order to empower children through participation, they need to be trained in adult ways of researching.

> While children's knowledge and understanding of childhood and children's lives is evident, a genuine barrier to children engaging in research is their lack of research knowledge and skills, not least because of issues about validity and rigour. … This is the focus of a large action research study … interim findings are extremely positive about the ability of children as young as ten to undertake rigorous, empirical research and the impact of such participation on child self-development. (Kellett 2005, p. 9)

However, by focusing on what children are seemingly lacking because they are not adults, the work of Kellett and others adopts a deficit approach: what are children capable of doing in research? As Prout asserts, 'Too often children are expected to fit into adult ways of participating when what is needed is institutional and organizational change which facilitates children's voices' (2003, pp. 20–21). Unlike this very adult-centric model of research often used with children in city research, the participatory activities in my studies have been sympathetic to children's ways of representing their world and therefore seek to consider how to support practices of children engaging everyday encounters and explorations of their place. Children's sensitivities to identify ways and means for documenting their lives are dynamic, and my role is to acknowledge and support this. The adults (and sometimes older children) become research assistants, providing children with support in order that they can go about designing and developing their research documentation.

The following discussion provides more detail of oral, visual and mobile and written methods utilized in children and cities participatory, place-based research work that I have used in my research projects. I then provide a short synopsis of the research design used in the two key country projects explored in this book.

Oral Methods

Interviews and Storytelling

Interviews and stories can help to bring to our attention the way we come to know places through the lives of significant people, significant places or events. Listening to children is central to the implementation of children's

rights, and the ethics of listening in a way that values and acknowledges the diversity of children's experiences and identity are critical. The ethical necessity of listening to children has been discussed widely by a variety of researchers (Clark et al. 2005; Westcott and Littleton 2005), but as Folque (2010, p. 240) clearly articulates, 'this is not simply a matter of allowing the child to express their views but also considering the ways in which such views will be interpreted and used, affecting children's identities and their life contexts'.

In many studies where the central focus of interviews with children is about listening and valuing children's voice, the technique is more about seeking to engage in a shared dialogue with children, rather than a structured interview with set questions. In these terms, it is often a mutually constituted data generation, where children act and express themselves within particular contexts and adults elicit a familial style of interaction (Hedegaard and Fleer 2008; Westcott and Littleton 2005). The stories children tell about the local area will include references to their relationships with family, friends, animals and environment, so objects such as people and places come together both in the present and in the past. Children sometimes recount their own experiences or they may share stories that have been passed on by others. These stories may be sensitive, revealing and need to be treated with respect. As this informal style of interviewing is the basis for most storytelling with children, the use of visual materials such as children's drawings, photographs, maps or mobile data, such as walking interviews, is often the central prompt and enhances the opportunity to engage in a deeper and richer storytelling process. The interviews with storytelling are normally audio recorded or videoed with research mentors writing notes to support later transcription and analysis.

Focus Groups

Focus groups at the start of a research project can provide the opportunity for children to be partners in the research design, for them to select what most appropriate data collection techniques suit them or their community and to get them thinking about the purpose and potential of the research (Fig 2.1). Focus groups, after the initial data collection, provide the opportunity to explore evidence and data, analyse data and work together to consider solutions and design actions of the future.

Fig. 2.1 Focus group and storytelling, place-based participatory workshops, La Paz Bolivia (Source: Photograph by author)

Visual Methods

Drawings

Participants' drawings of their urban environment, which can often be called a mental map or cognitive map, provide a useful tool for discussing and exploring: what children know and how they experience the urban landscape; their range of movement around the spaces; their favourite or least favourite places and why. Maps can provide the landscape as imagination through activities where children are asked to think about their place and elements within (Fig 2.2). These representations of the environment in our minds provide a unique image of a place. Kruger-Henney (cited in Tuck and McKenzie 2015, p. 106) states: 'mental map are extremely personal, subjective and intimate, and hold 'promise for understanding how space and place are internalized, interpreted, embodied and revised within individual-level experiences' (Futch and Fine 2014)'. The map or drawing is like an internal GPS system that operates to support survival, allowing

us to find our way home, know where safe or unsafe places are and what to expect when we turn a corner in the street. It is noted that the more experiential the exposure to an environment, the more detailed and complex our maps become. This is often connected to the means for children to be safe and to consider imaginary risks as part of their preparedness to respond to place. That is, if a child learns to read an environment and has lots of experiences of different environments, they develop more complex place-knowing. This in turn can then mean they are more likely to know the dangers or hazards and respond accordingly. Children imagine themselves through these maps as an entity in space, visualizing and locating their bodies within the physicality of the place. After drawing their map, the children in Bolivia and Kazakhstan were then asked to discuss key aspects of the map/drawing, in particular the material objects and their location in their place. They discussed their drawings and maps either in a focus group, individually with the research mentors, or with other children while the mentor documented the information on to the drawing. Alternatively, especially with older children who we worked with in Kazakhstan and Australia, the children wrote about the drawing or mental map themselves. For the dream drawing, children are asked to draw a place with all the qualities in it that are important for children. They can draw on experiences of places they have been before in their city or other cities, or it can be an imaginary place. Pink (2009 cited in Tuck and McKenzie 2015) emphasizes the importance of sensory meanings of embodied ways of knowing to emphasize the way places are constituted. For this reason, the visual representation of the mental map may not be limited to drawing. Some children say I can't draw, but this shouldn't be a barrier. The neighbourhood dream drawing has at different times been modelled from clay, constructed as a digital collage on an iPad, a collection of photographs. When working with HIV AID orphans in South Africa a number of years ago, the visual representation of place was thrown together as a collective nature–culture ephemeral sculpture located in the forest and collectively storied by the children.

Mapping

Unlike the mental map or drawing of their dream or neighbourhood place, participant's maps of their movement in a place provided a valuable resource for understanding children's freedoms and mobility. In contrast to the drawing activities that represent encounters of being in place with

Fig. 2.2 Children's drawing place-based participatory workshops, La Paz, Bolivia (Source: Photograph by author)

real or imagined objects, it is a research activity carried out in association with a locality using cartography techniques where children document themselves as moving through or locate themselves in certain areas, in relation to objects in the environment. This documentation is normally marked onto aerial maps or drawings of the landscape. Re-visiting maps by one children or layering of maps of different children or different contexts (day, night, gender) creates a three-dimensional tracking of children in place and allows for an analysis of the deep anthropocentric typography of encounters with the landscape. Examples of these types of moving maps can be specifically found in chapter five on movement and mobilities.

Photography

Photographs taken by young people are a valuable tool for gathering information on their urban environment. It is important that the participants have a chance to experiment using the equipment, so a number of focused tasks to give them experience are important. Just having photographs and

Fig. 2.3 Photographic interviews, place-based participatory workshops, La Paz, Bolivia

making adult judgements based on their content does little to provide the valuable insights that children data can provide (Fig 2.3). Hence, interviews are held with a group of children, other times these interviews are individual and sometimes they include a focus group where a child leads discussions exploring and exhibiting their photographs. Photographic methods are often used to compliment or support other methods, for example, interviews and stories, mapping and walking tours.

Mobile Methods

Walking Interviews

Walking interviews of the urban environment by children are a valuable method for understanding their perspectives on, and use of, the 'real' or imagined objects within an environment (Ingold and Vergunst 2008a). Viewing places first hand elicits new information and serves as a catalyst for provoking new ways of thinking about the place. Places can evoke emotional and sensory responses that are not present in the telling of a place experience. Walking tours can act as a starting point for exploring the environment or can be utilized in connection with some of the other activities such as photography, mapping or drawings. The children would normally

Fig. 2.4 Walking tours, place-based participatory workshops, Semey, Kazakhstan (Source: Photograph by author)

go as a group, and a reporter or documenter would be available to document the activities, so where the children went on the walk on a map, take photographs of objects or things that evoke conversations or seem to have relevance to the storying of the place as the children are walking. Children will often respond to each other's responses and build a collaborative place history of encounters with real and imagine objects, human and non-human performative acts stimulated through relational encounters. The time of day, the weather, the sounds, the smell and the touch can all be recorded creating layers of meaning and adding to the complexity of the walking with 'others' in place process (Fig 2.4). Porter et al. (2010, p.101), when writing about their research with children in Africa using walking interviews, wrote: 'Walking produces a shared rhythm of movement (Ingold and Vergunst 2008a) which encourages conversation, companionability and the sharing of understandings. Through our mobile interviews we learned a great deal about the everyday lives of the children whom we accompanied – and they in turn felt sufficiently at ease to ask questions of us.' During our work with children in cities of Bolivia and Kazakhstan, the walking interviews provided unique understandings through shared conversations that were not evident in any of the previous data.

Written Methods

Surveys

Surveys can be a valuable tool for acquiring large-scale data sets on children's lives that can be used by policy makers and government departments locally and for comparisons nationally or internationally. Surveys can be filled in by adult researchers with young children through dialogue techniques; for older children, they may be filled in with the support of an adult or by children themselves if they are confident enough. Surveys may be designed by children for them. Different versions of surveys may be for children, child carers, community members or government officials whose role it is to support children's needs. Comparing differences between the different groups within a community or even other cities or countries can often be very illuminating for children. Surveys can be paper based or online. The data coming from these surveys are about providing key trends or themes that would be followed in other aspects of the research. There is no intention to provide reliable quantitative data that are generalizable for a city.

The surveys I have used in my past research have come from two sources. The first is the child survey modified from the original child-friendly community self-assessment toolkit that was designed and piloted by a team of research experts for UNICEF and Childwatch International. The survey provides key information connected to children's rights as contained within the convention on the rights of the child. The second survey was devised by Hillman et al. (1990) and modified only very slightly in recent years for data collection in many countries to determine children's independent mobility. The value of this survey was that it had been consistently used over the past 30 years in a variety of diverse locations, therefore allowing the possibilities for some comparisons to be made between cities and countries. The survey which is given to children and their parent focuses on the amount of freedom provided to children by parents in order that they can move around freely in their place. As the analysis of data in this book focused on a post-positivist paradigm, survey data obtained in the fieldwork in Bolivia and Kazakhstan have not been included beyond a critique of its limits when discussing children's mobilities in Chap. 5.

Designing Research Activities

The 'Child Friendly Bolivia' project was implemented from 2012 to 2014, and 'Child Friendly Kazakhstan' 2011–2014. Both of these projects are examples of the place-based participatory research projects that I have conducted in low- and high-income nations throughout the world with children in a variety of city environments. These projects allowed the opportunity for children, through research, to be listened to carefully and thoughtfully about their experiences of living in the urban environment. In Bolivia, the project was with children from the three neighbourhoods in La Paz: Cotahuma, Tacgua and Manaypata; in Kazakhstan, it was located in the four cities: Astana, Semey, Aktau and Kyzylorda. The children were invited to engage in research focused on the everydayness of being and becoming child in the city, in particular what it meant to be growing up in these precarious times. The project activities, based on a participatory research methodology, were directed through a series of child-led participatory research workshops with at least 30 children aged from 5 to 15 years at each city or community site. All children were invited to select from a variety of written, visual, oral and mobile methods (Tuck and McKenzie 2015). The types of activities children engaged in included neighbourhood mapping and drawings, photographing environments and everyday life, small focus group discussions documented through shared stories, walking tours and interviews. Children in a few of the locations also completed a UNICEF child friendliness survey, and children and parents completed a children's independent mobility survey. The survey data were not used in this book but are available in city research reports that were commissioned by the governments of Kazakhstan and Bolivia and published online.

Central to this study was a fundamental shift in thinking by adults from these communities about the role children could perform in place-based research and urban environmental change: a shift from the view that children have limited knowledge of places (especially in terms of their functionality) and therefore adults are better skilled in determining what children's needs are. To the contrary, the research data performed through the actions of children as co-researchers revealed they were all knowledgeable and experienced place users who actively shaped places they inhabited and were being shaped through their encounters with the objects and things that made up their world.

The methodology used in the study evolved from previous place-based participatory research studies conducted by the author in previous studies, where it was shown to support community to realize the potential of children to have a voice and be active agents (Malone 2007; Malone 2008a, b). These projects, deeply embedded in place, were seeking to explore the social and ecological encounters of children in place. The projects were initially analysed using social and cultural theoretical frames, but as is revealed in this book, these frameworks simplified the complexities of the Anthropocene. A growing desire to move outside of these limiting frames and move towards a posthumanist conceptualization of children and their experiences of the Anthropocene meant that I was going through a challenging theoretical transition. This book is representative of theoretical grappling that is difficult and uncomfortable.

Grappling with Theory

The power of the human–nature divide is that it contributes to positioning humans as 'exceptional' and outside of nature (the non-human world), while at the same time supporting them to invite nature in but only by using its own forms of tyrannous colonizing domination (Cronon 1995). It could be argued it is this very sentiment of domination that has led humanity on such a destructive path, ending with a planet in these precarious and uncertain times.

Posthumanist approaches have the direct task of de-centring the human and problematizing human as exempt and exceptional to the uncontrolled murmurings and manifestations of the planet as a living entity. Within this approach the ecology of the planet and humans can no longer be viewed as entirely distinct realms with humans being outside and/or exempt from ecological consideration or from the consequences or implications of being nature. Posthumanism also problematizes the notion of human as exceptional whether religious or humanist; this is where human communities are distinguished by a unique ethics or politics where only they can possibly participate. To be human is to be always central to ways of knowing the world (and the universe). Both these positions assume what matters to humans is the most important, and other species and objects matter less. Some might say this has been the work of deep ecologists for many years. And even though while I am being sensitive to the theoretical work of deep ecologists who have also critiqued human exceptionalism, it is also evident they have mostly done this by alluding to the indirect knock on and systemic effect of the ecological crisis for humans. If there were for

example mass extinctions, environmental degradation and climate change it would indirectly compromise the capacity for humans to continue to exist. Braidotti (2013) provides a worthwhile warning when she states that deep ecology is potentially a regressive movement reminiscent of the sentimentality of the romantic phases of European culture. Deep ecologists frame their concern as the earth deserving the same or equal ethical and political consideration as humans. In some cases even attributing 'personhood' to natural lements such as rivers or non-human animals. According to Braidotti (2013), when applied, this approach 'humanizes the environment' and can become 'a well meaning form of anthropomorphic normativity being applied to nonhuman planetary agents' (Braidotti 2013, p. 85). Braidotti and others (Smith 2013; Haraway 2015) have argued this does little to disrupt well-established human–nature, subject–object binaries. The theory of ecological posthumanism I am wrestling with in this book contests the arrogance of anthropocentric approaches, even those found in deep ecology, by enabling a shared sense of the world. This enabling of a multiplicity of ecologies/beings defines community as central—the world is and becomes a community of beings. At this point, taking up the work of Mick Smith (2013), who defines an ecological posthumanist perspective as a strategy for supporting an 'ecological community', has become very useful to expand my thinking.

A posthumanist ecological community emphasizes the myriad of ways that beings of all kinds, including human individuals and collectives, interact to create, sustain or dissolve community. Jean Luc Nancy (1991) talks of 'beings in common'—bodies, being sensed evolving ecologically through immersion in the exchange of matter (Derrida 2005). Donna Haraway (2003, 2008), although not calling herself a posthumanist, also discusses a new way to consider community. She argues that subject/object nature/culture divides are linked to patriarchal, familial narratives and call for an enlarged sense of community based on empathy, accountability and recognition extending to the non-human as subjects such as cells, plants bacteria and the earth as a whole. These ideas are particularly pertinent in Chap. 7 as I explore the idea of 'waste as monstrous matter' and the porosity of bodies. To speak of ecological communities, that we are 'beings' objects and subjects in common, means we can't be exempt from the consequences of being in this common world with others, exposed to each other and exposed to shared pathogens in a variety of ways.

Therefore, to grapple with, in order to re-theorize the research studies in this book, I have employed mechanisms that will help the reader to disrupt idealized ways of understanding children's relations with the

more-than-human world. To do this, I have sometimes employed the theoretical device of 'intra-action' as used in new relational materialism approaches to support documenting messy, heterogeneous relations between children and their environment (in this case, the cities) (Barad 2007; Rautio 2013a; Rautio 2013b). The world, as used with this approach, is viewed as dynamic, in a constant process of 'being' and 'becoming' material matter. Intra-action constitutes a reconfiguring of 'things' and 'objects' that are not structured with a specific space or time but are enacted as agential entities flowing in a space-time continuum (Barad 2007). The focus of reality in this approach is not on the phenomena of the things (their specific properties) but how the things are 'in-phenomena'—being produced through a series of entangled relational possibilities with other objects and things. Barad (2007, p. 185) uses the term 'onto-epistemology' to describe 'the study of practices of knowing in being'—an understanding that is central to intra-action. Onto-epistemology assumes that epistemology and ontology are mutually implicated 'because we are of the world', not standing outside of it. The separation of epistemology from ontology, according to Barad (2003, p. 829), 'is a reverberation of a metaphysics that assumes an inherent difference between human and nonhuman, subject and object, mind and body, matter and discourse'.

De-centring the human through a process of iterative intra-activity allows me to disrupt the human exceptionalism and exemptionalism by proposing a posthumanist refiguration. By not viewing 'human' and the more than human as simply *objects* being directed and responding to the interaction of the human but instead understanding entities in the more-than-human-world as *subjects* in their own right who exercise agency (Barad 2007). Because '[p]osthumanism doesn't presume the separateness of any-"thing". Let alone the alleged spatial, ontological, and epistemological distinction that sets humans apart' (Barad 2007, p. 136). Therefore, posthumanism for example, using an approach of intra-action, can fulfil the aim of disrupting the Cartesian divide between humans and objects or things in our environment by challenging the simplistic dichotomies of animal/human, nature/culture and object/subject (Barad 2007).

It is then in defiance of a past idealized child–city relationship that I have attempted to view human and non-human bodies to be constantly engaging in relational, mutually implicated encounters. The ideas of Harker (2005, p. 57) are useful here with his thesis around the body,

embodiment and play drawing on the work of Deleuze: 'Deleuzian bodies are at once materials, semiotic, social and incorporeal, as indeed bodies are when encountered in our everyday (playful) lives.' That is, there can be a reimagining where new relational materialism and posthumanist approaches can support researchers and educators to consider how the child in the city discussions might be different if agency is no longer the property of humans alone (Barad 2007). According to Fox and Alldred (2014, p. 1), this new relational materialist ontology:

> supplies a conception of agency not tied to human action, shifting the focus for social inquiry from an approach predicated upon humans and their bodies, examining instead how relational networks or assemblages of animate and in animate affect and are affected.

Approaches of posthumanism and tools of intra-action for example allow for a disruption of universalisms in current child in nature debates by 'recognizing the entanglement of human and more than human relations' (Taylor 2013, p. 118). This new reading of my research with children in urban contexts has allowed me to exemplify: 'Existence is not an individual affair. Individuals do not preexist their interactions; rather, individuals emerge through and as part of their entangled intra-relating' (Barad 2007, p. ix).

Posthumanist and new relational materialist theories seek to be critical of the value of human/nature binaries and the limits it places on how we come to view humans as entangled in, and embedded in the more-than-human world has been a feature of scholarship in a range of disciplines evolving over the past 20 years (Head 2016). Many disciplines that have been very influential in the children's environments and children in cities research: for example urban planning, landscape architecture, environmental psychology education and childhood sociology have not be forthright in taking up these new theoretical approaches with the dominant critique of research on children's lives in cities addressing mainly the physical disconnect of children from nature. Centered on neo-liberal and conservative agendas around the sustainability of the planet and the development of sustainable or resilient cities, the needs of children and other marginal groups, including the non human entities in cities, has been based on reserach that supports an economic rather than ecological model. The theoretical work accompanying much of this research has therefore narrowly focused on social cultural frameworks that are difficult to shift from

being solely attentive to human exceptionalism and planetary management and technological models of domination. The main exception has been in geography, with many urban and cultural geographers who have been interested in children and urbanization recently applying these theories in their research. The journal *Children's Geographies*, for example, has a number of newly published articles where authors have engaged posthumanist and new relational materialist theories in their research.

Throughout this book, I am using, applying and grappling with a reconfiguring of my past research on children in cities by applying posthumanist and new relational materialist theories as a means for grasping with, and getting to, the deep meaning of the Anthropocene and the complexity of children's relations within it. I will also at times be exploring the materiality of children's worldly relations within and through their city engagement using analytical techniques such as diffraction. Diffraction allows me to consider not what I see as a mirror of the world that children inhabit but encourages me to view differently the potential of a shared ecosystem of bodies and planets. Often throughout the book I will insert scientific information juxtaposed with personal stories and children's images as diffractive possibilities. These threads weave a complex and deep understanding of the different ways for representing what knowing and being in the Anthropocene could mean. Extending on my previous reflexive and activist writings in the field of children's environments, I am engaging with a diffractive lens as a counterpoint to reflection. By attending to Haraway's notion of relational natures of difference, I use a lens to be responsive to diffractive patterns that do not map where differences appear but rather maps where the *effects of differences appear*. Barad (2007) states that while diffraction apparatuses help us:

> measure the effects of difference, even more profoundly they highlight, exhibit and make evident the entangled structure of the changing and contingent ontology of the world, including the ontology of knowing. In fact diffraction not only brings the reality of entanglements to light, it is itself an entangled phenomenon. (Barad 2007, p. 73)

Diffractive practices in my theoretcial work does this not by elevating all things or matter to the status of exceptional human or de-elevating human to the status of object or things but by exploring the bio-political, bio-ethical and ontological in order to pay attention to the subtleties of an ecological community that take into account new relational materialist ontologies. Ontologies where 'vital' and 'lively' materialism is relational

and emergent, it is an enduring structure of assemblages that are the product of their internal inertia. Vital new materiality acknowledges the aliveness of matter; it is always more than mere matter: it is 'active, self-creative, productive, unpredictable' (Coole and Frost 2010, p. 9).

In some chapters, this theoretical work is more sophisticated and attentive, and in others I have struggled. But I decided the struggle is not a reason not to proceed. This book is an exploration of applying new theories in order to be with my data differently. In Chap. 6, for example, I have deployed strategies of diffraction (Barad 2007) in order to reveal the complexity and richness of relations between child and dog bodies. I have sought in many chapters to celebrate the entangled nature of differences (Barad 2007) and the materialization of all bodies, both human and non-human, on landscapes of the city. 'Diffraction is at the very heart of onto-epistemology, which affirms that ontology changes with epistemology' (van der Tuin 2014: 235). I am employing these strategies of diffraction and intra-action in order to represent the complexity of spaces where children in La Paz and their dog companions come to encounter one another and challenge the sanitized boundaries and binaries so closely maintained by western middle-class sensibilities. I have explored these relational and materials aspects of child–animal relations by de-centring the human and embracing strategies such as intra-action in new relational materialism to provide a different reading of child–dog bodies. Extending the theorizing of child–nature binaries explored in Chap. 5, I also seek to interrogate differently the child–nature encounters. By bridging the nature–culture divide and by rejecting moral, cultural and classist universalism, the book through these theoretical grappling is seeking to consider what an embodied 'childnature' collective could be, and it speaks to these times. I deliberately seek to notice and attend to questions of how children view and experience environments and incorporate their voices alongside others to be representative of the complexity of urban environments in the Anthropocene. The focus on complexity and materiality makes claims that we are all ineradicably hybrid beings inhabiting hybrid geographies. Throughout the analysis of the research with children in Semey, for example in Chap. 7, I have come to understand this notion of complexity through diffraction, drawing deeply on the concepts of porosity, interference and difference. Differences in this sense could even extend hybridity to incorporate the notion of mutation. There feels to me an interesting relationship between the technique of diffraction as an analytical tool and the paradox of the diffraction of radioactive waves that interfere with, and

change, the cellular composition of all objects located over time-space in this place. Throughout the book, I am reworking and reconsidering intra-species, intra-nature relations and questions of the 'human-centric', 'Western-centric' and 'class-centric' universalisms of dominant voices in the current discourses of children in cities research particularly where there has been a superficial focus on high-income priviledged nations.

By enacting posthumanist and new relational materialist readings retrospectively, I am shifting away from the child as the central object of my gaze. I am being attentive to and noticing the non-human entities through which their world is being encountered, the relational: 'Matter feels, converses, suffers, desires, yearns and remembers' (Barad interviewed by Dolphijn, R and van der Tuin 2009). These narratives can support an un/learning, a new imagining for children and their relations to their world. By seeking to un/learn the way we have come to 'know' and 'be' in the environment, 'it provokes us to consider matter as a co-composing agent of knowledge production and change' (Rotas 2015, p. 94). This unlearning is a challenge as we attempt to know agency outside of the acting human body (Bennett 2010; Rotas 2015). In these precarious times, it continues to be important to consider an approach that draws attention to posthumanist ecological communities that seek to de-centre the human and are attentive to the 're-doing of material configurations and space-timemattering. The past, the present and the future are always being reworked' (Barad interviewed by Dolphijn and van der Tuin 2009). My work engages with the tracings of ghosts from the past, they come to that haunt us in the present and then project our collective imagination into an uncertain future. This is ethical work. According to van der Tuin (2014), feminist new relational materialist models, like the ones described here by Barad, 'scramble conventional notions of subjectivity that separate the rational human from an external environment' (pp. 232–233). Theorizing, using Barad's agential realism, means:

> Questions of ethics and of justice are always already threaded through the very fabric of the world. They are not an additional concern that gets added on or placed in our field of vision now and again by particular kinds of concern. Being is threaded through with mattering. Epistemology, ontology, and ethics are inseparable. Matters of fact, matters of concern, and matters of care are shot through with one another. Or to put it in yet another way: matter and meaning cannot be severed. In my agential realist account, matter is a dynamic expression/articulation of the world in its intra-active becoming. (Barad interviewed by Dolphijn and van der Tuin 2009)

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CHAPTER 3

Cities of Children

> The city is an irresistible magnet. For the young in small towns and village where nothing ever happens, it pulls with the promise of variety and excitement. It draws those who chafe against the daily round and common task, those who feel that they can no longer stand Mum and Dad and the constraints they represent, those who know that back there in Deadsville there are going to be no jobs and no prospects, that nothing is ever going to happen. (Colin Ward, *The Child in the City* 1978, p. 52)

Cities are often positioned as critical sites for documenting global ecological change, as they have mostly taken up the heavy lifting in terms of rapidly increasing population growth. Critically, cities are often simultaneously represented as being significant contributors to the 'cause' of climate change, where urban areas and their inhabitants may be responsible for up to 75 per cent of global energy consumption and carbon emissions. Cities, particularly those in vulnerable positions on the coast, are also foremost among the likely environments that will fall 'victim' to climate change and other crises associated with the age of the Anthropocene (Hodson and Marvin 2010).

With an estimated 60 million people in low-income nations leaving the countryside every year, cities are growing globally at around one million new people every week. It is a challenge to comprehend the impact of this for those humans arriving for the first time and those already adrift in the city. Unfortunately, one-third of all these city dwellers, especially those

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newly arrived, will start city life on the streets until they can find makeshift housing in slums or transitional communities on the margins or edges of the metropolitan, land that is unstable or leftover, wild or degraded. They often share these spaces with the animals who have also been pushed to the margins of the sprawling urban populous. This introduction to being on the margins of urban life can be exceptionally grim for all, especially children and animals.

Children in the majority world now make up around 60 per cent of the total population with an estimated 600 million children worldwide living in poverty in streets, slums or marginal housing in cities (Malone 2015a, b). Children will face significant dangers in these situations and, along with the elderly, will be the most vulnerable. The considerable degradation of natural and social environments through overpopulation and phenomena such as climate change increases children's exposure to a number of risks. These risks include pollutants and pathogens in the air, water, soil and food; increased traffic and street life, causing more likelihood of road accidents; insecure slum housing and tenure; and varied access to education and health provision. All these contribute to a precarious and uncertain future for them and those they share the environment with. But it isn't just these large-scale structural risks. Many children are often represented as susceptible to preventable health problems, mostly due to exposure to unsanitary conditions impacting on their survival. Globally, eight million urban children died in 2010 before reaching the age of five, largely due to pneumonia, diarrhoea and birth complications (UNICEF 2012). Most of these lives could have been saved by simple services and facilities being made available within communities. City officials, even with the best intentions to support all city entities, human and non-human, find themselves burgeoning under the strain of the current rates of city expansion.

Many voices in the development movement have called for 'a people-centred and planet-sensitive agenda to ensure human dignity, equality, environmental stewardship, healthy economies, freedom from want and fear, and a renewed global partnership for sustainable development' (United Nations 2014, p. 14). In these discussions, tackling climate change, for instance, and fostering sustainability are viewed as mutually reinforcing sides of the same coin. To address the breadth of issues confronting cities, the Sustainable Development Goals (SDG) Post 2015 United Nations programme has called for a 'transformational and universal post-2015 agenda, buttressed by science and evidence, and built on the principles of human rights and the rule of law, equality and sustainability'

(United Nations 2014, p. 14). But I believe it will take more than intergovernmental agendas and tired models of sustainable development to address the charge of the Anthropocene.

My research in cities has always focused on the importance of investing in and understanding children's (and women's) lives. I have done this by supporting a view of sustainable development that seeks to eradicate poverty and enhance inter-generational equity, while at the same time addresses ways to minimize the exploitation of the planet's resources. The understanding of sustainability I am employing in this book is not as concerned about these issues of social justice and rights from a humanist perspective as they were in my past research, where society and the environment were separated realms:

> but rather about their relations in the long term. These relations are intrinsically dynamic. This change is caused by an intricate network of influences, by which all kind of living beings are in contact with each other, pushing evolution forward. (Arias-Maldonado 2013, p. 436)

I am committed to the view that by engaging with children there is the likelihood that we can learn about being in a dynamic relation with the planet. That is, in a rapidly urbanizing world that is susceptible to large-scale disasters and everyday hazards brought on by the global environmental crisis, I want to consider the importance of supporting a meaning of 'being one with the planet' that is complex rather than simple and encourages children to be listened to. In an attempt to illuminate the challenges of how I have come to be in this place and my shift from a humanist to a more posthumanist perspective, I have included a historical perspective of research on children in cities, including the global UN child-friendly cities movement, as a means of exploring the question: what are the limits to these humanist perspectives? To begin, I will consider what it means to be a planet in crisis and what the implications are for children and for defining the concept of the Anthropocene.

Cities in Global Crisis

> Across the world we are facing a crises of sustainability, resilience, security, stability and adaption. Many of our cities have become sprawling and bloated zones of sustainability. In the meantime, too many politicians and commentators squabble over schedules, timetable and buck stops. (James et al. 2015, p. 4)

While 'sustainable development' has become the archetypal model of positive planetary planning for a transformative agenda of ecological care; since its inception, the principles and goals have continued to be contested. According to Arias-Maldonado (2013, p. 429), 'The rise of climate change and related notions such as the Anthropocene have confirmed the shortcomings of classical environmentalism's approach to sustainability'. He believes, and I agree:

> (a) pragmatic turn is now taking place and environmentalism should be able to make a contribution to it. In this context, adopting a post-natural stance with regard to sustainability is a key part of the much-needed renewal of environmentalism itself. (Arias-Maldonado 2013, p. 429)

This tension of sustainable development and a post-natural environmentalist stance as referred to by Arias-Maldonado are highlighted particularly when national governments seek to maintain the integrity of their own neo-liberal priorities while expressing desires to be 'sustainable'. Governments struggling to provide a balance between their national economic priorities and the overall ecological and social good of living communities at a local and/or a global scale is central but only part of the story. While the issues of urbanization didn't arrive unheralded, their profound implications are now being projected as the most significant issue for humanity and all inhabitants on the planet. With this astounding expansion in population growth, there has been a corresponding exploitation of resources to accommodate humans with little regard for the impact on our non-human companions. In the past three centuries, there has been an unprecedented disruption of a long history of co-evolution of our species with the biosphere. With a tenfold increase of humans to 6000 million on the planet coinciding with a growth of 1400 million cattle, a tenfold increase in urbanization, the near exhaustion of fossil fuels, animal extinctions and the ongoing implications of climate change, we are now at the limits of (human) growth (Sachs 2011); we are beyond the tipping point. Eliminating social disparities and designing a quality of life for humans, while still being aware of the limits to what we can take from the planet, were central, but for the majority of the world's nations, this limit versus growth debate is still not on the agenda. The authors of the UNEP (2011) report on the green economy argue that 'the so-called trade-off between economic progress and environmental sustainability is myth' and that 'moving towards a green economy has the potential to achieve

sustainable development and eradicate poverty on an unprecedented scale, with speed and effectiveness' (2011, p. 622). The report (UNEP 2011) outlined the reconciliation of the twin development aims of environmental prudence and social justice through a focus on lower carbon use, resource efficiency and social inclusion. At a time in our human history when more people are living in urban areas than in rural areas, this immediate task, the battle for some form of autonomous harmony with the planet, needs to be promoted as critical to a collective shared future.

Continued growth of the world's population is projected to add 2.5 billion people to the urban environment by 2050, with nearly 90 per cent of these increases being concentrated in Asia and Africa. There is great human diversity in the characteristics of the world's urban environments: close to half of urban dwellers reside in relatively small settlements of less than 500,000 inhabitants, while nearly 1 in 8 live in the 28 mega-cities of ten million inhabitants or more. The number of mega-cities has nearly tripled since 1990; and by 2030, 41 urban agglomerations are projected to house at least ten million inhabitants each (United Nations 2014). That is, by the middle of the twenty-first century, the urban population will almost double, and an estimated 3.4 billion people in 2009 living in cities will become 6.4 billion by 2050. And while currently the countries with the largest urban populations are predominantly high or highly developed nations according to the Human Development Index (HDI) (UNICEF 2012), these countries have essentially plateaued in terms of growth and are likely to decrease in urban growth over the next 40 years.

Bolivia, for example, has an urbanization rate of approximately 67 per cent (lower than the majority of Latin American countries), but with an increasing rate of 2.5 per cent, which is one of the highest in the world. Many countries currently with the lowest urbanization rates (below 25 per cent) are predicted to have the most significant urban growth (WHO 2010). Unfortunately, many of these countries have faced the most significant challenges in recent decades, including economic and political instability, wars, low levels of education, poor health standards, poverty, scarce housing, environmental destruction, animal extinctions and natural disasters. The consequences of these challenges have often amounted to limited or depleted human infrastructure in both rural and urban environments; insecure governance systems and large-scale environmental degradation including non-human animal and plant losses; and depletion, contamination and pollution of natural resources. The need for a model of living well with others on the planet in these rapidly urbanizing regions, is I believe,

a matter of great urgency. While it has been recognized that a holistic approach to urbanization is critical for improving standards of living for the urban poor (United Nations 2014), a model for living well with 'others' (including human and non-human) could support new ways of considering a postanthropocenetric world.

Despite perceptions that associate the term 'sustainable development' mainly with 'ecology' or 'nature', the broader focus of sustainability of cities is usually on the ways the community can meet the natural, social and economic needs of human (sometimes also non-human entities but mostly not) within the planetary boundaries and limits, so that life can both be sustainable and be sustained. This has meant the continued need to respond to poverty eradication, human rights and equity while also realizing more sustainable patterns of consumption and production, stabilizing climatic forces and managing the 'commons'. Urban growth and sustainable development mostly don't seem like compatible partners, but many say if the human population does continue to grow at the rates predicted, then cities will be the only way to create a sustainable future for human and their non-human companions. That is, high-density urban environments will be the most effective to accommodate and provide infrastructure to the billions of new inhabitants to the planet while still trying to maintain some balance of an ecological community. Because cities can concentrate potentially aggressive activities with large numbers of people close together, the cost of providing resources like water, roads, electricity and sewage treatment is lower than in rural areas. And while new economies tend to become more high polluting during early stages of development because they first adapt inexpensive technologies that are relatively inefficient, as a city grows it often does start to build greener infrastructure. Some analysts have argued that developing countries can also now skip the early stages of industrialization with ecological 'leapfrogging'—that is by using advanced, clean technologies as soon as they are fielded in order to avoid the consequences of these high-polluting industries. Some developing countries, for instance, have skipped installing telephone poles and wires and moved straight to cell phones as a primary communication system. Bolivia, for example, has been one of the first Latin American countries to launch its own satellite in space and maintain sovereignty over its internet use. But these possibilities for a greener way of considering growth are dependent on economics and good governance—green technologies are often more expensive than lesser non-clean technologies, and for the many African nations that will bear the brunt of urbanization without strong political will, this will be a difficult reality to materialize.

Urbanization, while increasing the concentration of humans, is also decreasing biodiversity locally and globally. As cities grow, vital habitat is destroyed or fragmented into patches not big enough to support the complex ecological communities of plants and animals that lived in those places. Those animals who depend on natural habitats such as forests, fields or wetlands to survive are at risk. Urban growth has meant that in most cases these habitats have been degraded, lost or paved over to make way for houses, factories and roads. In the city, plant and animal species who once flourished have become endangered or extinct; they are literally swallowed up by human habitats, or even worse, those rural areas that have been abandoned are not left to be places for animals and plants to flourish or the natural ecology to be restored; instead, they are taken over by corporates and depleted even further.

According to Barnosky et al. (2011, p. 51), scientists define mass extinctions as 'when the Earth loses more than three-quarters of its species in a geologically short interval, as has happened only five times in the past 540 million years or so'. Given the number of species lost over the past few centuries and the current rate of decline, many biologists believe we could be seeing the sixth mass extinction (Barnosky et al. 2011). Climate change, often touted as one of the key consequences of our human scramble for resources to feed the hungry cities, will continue to cause mass extinctions as its impacts become felt, especially for the most exposed species and for the most vulnerable within selected species. However, according to Wade (2015):

> Mass extinctions will open ecological niches, and environmental changes will create new ones. New creatures will evolve to fill them, guided by unforeseen selection pressures. What this new world will look like, exactly, is impossible to predict, and humans aren't guaranteed to survive in it (Wade 2015, par. 5).

But while surviving in the city environment is not without its challenges for humans and non-humans, there are some species who have adapted, and these resilient species can be found to thrive alongside humans in cities. Duhn (2017) in her studies of Berlin states:

> Approximately 20,000 diverse species inhabit Berlin, and the number of new animal species migrating to the city is on the increase. This is due to the specific history of the city which allows a considerable amount of undeveloped sites and empty lots to still exist in contrast to other metropoles where urban planning has sanitised the cityscape. (p. 8)

The studies of Pacini-Ketchabaw and Nxumalo (2015) also come to mind also, as they consider ways to unsettle the nature/culture divide through their observations of unruly raccoons entangled in the lives of children whose suburban childcare centres are located close to the edge of a forested patch:

> Raccoons, children, and educators co-habit this colonized space on unceded Coast Salish territory … Raccoons lived here for hundreds of years before the university and childcare complex were built. Not only have raccoons adapted to the presence of humans in their habitat, they are active participants in the life of the childcare centres. (Pacini-Ketchabaw and Nxumalo 2015, p. 152)

They identify that the presence of raccoons could be viewed as a consequence of environmental degradation and the adaption of raccoons to develop an evolutionary intelligence on the means to build cohabitation relations with humans:

> While urbanization, climate change, and other devastating human actions in the Anthropocene have eliminated numerous species and threaten many more, some species, including raccoons, have thrived. As 'urban adapters' raccoons are one of the most efficient [mesopredators] at exploiting anthropogenic resources. (2015, p. 153)

Slums, Children and the Anthropocene

> As I walk through the slums of Africa, I find it hard to witness children suffering under what can only be described as an urban penalty. I am astonished at how women manage to raise their families under such appalling circumstances, without water or a decent toilet. The promise of independence has given way to the harsh realities of urban living mainly because too many of us were ill prepared for our urban future. – Anna Tibaijuka, Executive Director, UN-HABITAT. (Worldwatch Institute 2007 p. xix)

As Anna Tibaijuka so aptly describes in this opening passage, the impending crisis of urbanization on children's lives is now a harsh reality. The reality of urbanization will see many children facing significant dangers from the degradation of natural and social environments, including increases in pollutants and pathogens in the air, water, soil and food; additional roads and traffic incidents; and the ongoing impacts of insecure slum housing, poor education and health provision. Even though

investment in children (and families) is essential for strengthening children's ability to reach their potential to be engaged active global agents, it is clear models of sustainable development that incorporate children and families have been limited and continue to focus on economic development over ecological restoration.

As the numbers of children living in slums, shantytowns and informal settlements rise steeply, the need for them to feel safe and secure, to be living well with the planet is deeply compromised. According to the United Nation's Special Rapporteur on Adequate Housing, currently there are 200,000 of these slum communities across the world, most of them in and around cities, and that number is growing exponentially. Even before the economic crisis of 2008, about one-third of all city dwellers lived in slums, slums which will grow in size by one billion more people over the next 20 years. Cities in least developed countries are expected to absorb most of this urban population growth in the next two decades, therefore increasing the slum population by nearly 500 million between now and 2020 alone. One in seven persons on the planet is living in slums. If that rate of slum population continues, it could be over three billion people seeking to reside in the city slums by the middle of the century.

Slum or squatter cities are in the most part unexpectedly less ecologically compromised due to their low resource use. Ironically, many slum dwellers use less energy and resources and generate less waste than their upscale neighbours, but the poor live in degraded areas and receive fewer resources and services, and therefore bear the burden generated by these higher-income city consumers. For instance, in some areas of Mumbai such as Dharavi slum, the maximum density of slum settlement is around one million people per square mile, and these areas due to the lack of services have minimum energy and material use. People move around by foot, bicycle, rickshaw or shared taxi; they share power if they have access at all, and whenever possible, they not only recycle materials for their own use but also recycle others' waste for resale. The Dharavi slum site, for example, has over 400 recycling units and 30,000 rag pickers who sort 6000 tons of rubbish every day. Many commentators believe squatter cities that have emerged and will continue to emerge at a rapid pace in the next 30 years can teach us much about future urban living, particularly around low consumer patterns. Because even though clearly large cities tend to consume more resources than small ones, consumption patterns and technology choices are normally more harmful and unsustainable than population size. Some commentators argue that the only way

the planet will be able to sustain the level of population growth in cities in developing nations would be the mainstreaming of consumer patterns of slums.

While living in slums might be the way the majority of children will experience growing up in cities, it is important not to romanticize slums—they are far from being an unmitigated good. Slums can concentrate crime, pollution, disease, disaster and injustice as much as they support business, innovation, low consumption and sustainable practices. For many city officials, there is not enough knowledge to be able to comprehend what the long-term strategies for coping with climate change and children in cities might be. Yet it is clear that the urban slums in low-income countries are places where children will be most at risk. This risk is due in part to their lack of infrastructure and resources to cope with disasters should they arise, but also because these urban slums are often built in the most hazardous areas where there is risk of landslides and floods, close to industries, nuclear reactors, or ports and beach fronts susceptible to rising sea waters, tsunamis and contamination of fresh water supplies. And for those children who are already susceptible to sanitation-related illness from degraded environmental conditions, the situation is likely to worsen due to the onslaught of climate change events predicted. In La Paz, for example, regular floods and landslides (that are likely to increase with climate change) and their disastrous consequences demonstrate the vulnerability and precarious nature of slum and squatter settlements due to their often tentative development on 'leftover' or marginal land. These settlements are mostly considered illegal by local authorities, excluded from official plans and consequently do not receive support for basic infrastructure development.

Needless to say, climate change events such as drought in rural areas also displace families, therefore adding to the influx of populations moving to cities to find new sources of income. Bartlett (2008, p. 514) believes in order for cities to be able to support children and reduce the risks that climate change is likely to bring, they must address those measures that even on a daily basis will protect children's health such as 'adequate drainage, waste removal and proper sanitation'. According to Bartlett (2008), cities planned with the vulnerability of children in mind, using risk-reduction measures, will be those most likely to be able to act effectively now and in the future scenarios of climate change disasters.

Knight (2015, p. 156) argues, 'Sustainability is a powerful sociopolitical metaphor in the Anthropocene' and 'notwithstanding its limitations

… its narrative context should be widened to include impacts on human wellbeing and environmental and social justice.' According to the historical international principles of sustainable development, the simultaneous achievement of the goals of sustainability should meet the needs of the present generation without compromising those needs of future generations. The goals of sustainability also insist that nation governments maintain the integrity of their global partnerships and local policies through processes which are participatory and equitable. The United Nations Convention on the Rights of the Child (CRC) identifies a child's well-being and quality of life as the ultimate indicator of a healthy environment, good governance and sustainable development (UNICEF 1996; UNICEF 1997). The principles of the CRC reinforce the goals of sustainability when they challenge governments to uphold the child's right to live in a safe, clean and healthy environment with their both human and non-human companions. As one of the most vulnerable groups in our community, children are thought to have a special interest in these goals and the importance of a humane and just future for the planet. The detrimental impacts of the Anthropocene as witnessed through unchecked urbanization, where sustainability is not achieved, can be seen to affect children profoundly and limit their potential for a future life. Since the late 1980s there has been a convergence, and in many instances, a symbiotic relationship between the principles of sustainable development and children's rights (Malone 2006); yet it has seldom been voiced through these latest discussions on how to address the injustices we are performing on the future of our children when we continue to rampantly devour their future.

UNICEF Child Friendly Cities is one project that has been recognized as a significant global project that has sought to engage with issues of children's rights and an ecologically sustainable future for the planet. With around 67 UNICEF country offices supporting many thousands of child-friendly cities, it has been an active programme supporting children in cities. The 2012 'State of the World's Children' report (UNICEF 2012) focused on urbanization and recognized the significant role the Child Friendly Cities Initiative (CFCI) has played in planning cities to alleviate the detrimental impacts of urbanization on children and their communities. It identified in particular the importance of developing city-wide strategies and monitoring these in order to document the impact of rapid urbanization, climate change and other anthropogenic events on children's lives.

For some cities, especially in high-income nations, the emphasis was on child friendliness by addressing the outdoor environment such as improving recreational spaces, green spaces, young people's alienation and controlling traffic to make streets safe for young citizens. In low-income nations, the focus has predominantly been on more immediate issues such as the impacts of poverty, historical and political injustices and environmental degradation. Only loosely theorized but well documented at a very pragmatic level, this research was conducted by me and others in the field of children's environments over a number of decades. This work has contributed to a genealogy of the changing social and political landscapes of city life for children, although mostly silent in these years of data collection on children have been children's encounters with the non-human others in these environments. In retrospect, as I look back on these reports and the years of research I performed with children on their lives, I see we were in fact silently documenting the demise of the planet and its impact on children. It was through my recognition only recently that this dialogue of children's experiences of the impending acceleration of the Anthropocene was actually present, but overlooked by myself and others that initiated my interest in retheorizing the data through a posthumanist approach. Bolivia and Kazakhstan are the two of the most recent countries where I had been invited by UNICEF to conduct research with children. It has been through this desire to re-turn to this data and ensuing sense of urgency that prompted me to write this book. I complete this chapter with a short entry on the two key sites that I used for my analysis.

Urban Transformations in Bolivia

Bolivia has often been known as the poorest and the most undeveloped country in Latin America. Two-thirds of the country's population live in a small number of large sprawling cities, of which La Paz is the largest. Mostly these families have come to the city from rural areas outside of the valley in order to find a better life for themselves and their children. For many of these rural families in La Paz, this means living in makeshift houses precariously perched on the steep reaches of the valley. A UNICEF representative explains urbanization in the region of La Paz, Bolivia:

> The rural-urban composition has changed dramatically in the past 20 years. According with 1992 Census, urban populations represented 40 per cent of total population and rural population was the majority with 60 per cent.

> After 23 years, almost 70 per cent of Bolivian people live in main cities in the urban areas while the other 30 per cent stays in rural areas. As a result of a sustainable economic growth and thanks to the combined actions taken by public and private investments in the last ten years, La Paz urban infrastructure has changed deeply. Starting with the construction boom that increased in hundreds the number of buildings everywhere, the south zone of La Paz is no longer a peaceful residential zone, but a commerce zone with public services, restaurants and a heavy traffic. Improvements have been made in roads, bridges construction; three lines of cable cars installed connecting El Alto city with La Paz city and the announcement of construction of five lines more. (Interview September 2014)

As it continues to grow, the city of La Paz climbs the hills, resulting in varying elevations from 3200 to 4100 m (10,500 to 13,500 ft). Overlooking the city is the towering triple-peaked Mountain Illimani, which is always snow-covered and can be seen from several spots of the city, including from the neighbouring city of El Alto. As of the 2010 census, the inner city had a population of 877,363. One-tenth of the whole population of Bolivia lives in La Paz. La Paz Metropolitan area, formed by the cities of La Paz, El Alto and Viacha, makes the most populous urban area of Bolivia, with a population of 2.3 million, nearly half of which are children under the age of 18 years. The geography of La Paz (in particular the altitude) reflects society: the lower areas of the city are the more affluent areas. While many middle-class residents live in high-rise condos near the centre, the houses of the truly affluent are located in the lower neighbourhoods southwest of the Prado. And looking up from the centre, the surrounding hills are plastered with makeshift brick houses of those more disadvantaged communities. At the very edge of the valley on its highest reaches, the communities are located on such steep hillsides that they can only be accessed by stairs; these areas, although having amazing views across the valley, are under constant threat of landslides and flooding. The city is divided into 7 main districts, called 'Macro Distritos', which are, in turn, divided into 21 small districts or zones. The children who took the photographs live in the first main district, Cotahuma, and in a neighbourhood of Munaypata north of the centre. At over 4000 m above sea level and around 5 km from the city centre, residents of these neighbourhoods can view the length of the snow-capped Cordillera Real and La Paz city.

Bolivia is known as a country with the poorest economy in South America. On the HDI, Bolivia ranks 113th out of 182 countries globally.

About two-thirds of the Bolivian population live in urban areas; of this group, the majority (over 60 per cent) live in slums. In La Paz, a greater percentage of people live in slum conditions than the national average. These slums are characterized by a lack of access to water, sanitation, electricity, transportation and other basic services, as well as unsecured tenure. In many cases, housing is informally constructed by the community themselves, and the houses are mostly makeshift and structurally unsound. A UNICEF staff member who was my guide told me on one of my early visits:

> La Paz is diverse and because of the National Government is placed in this Department migrants for the all country has come to La Paz looking for opportunities. Internal migration has created a lot of suburbs not always with access to social services, precarious housing built in slopes and poverty incidence. Those are big challenges for council and national governments, but at the same time an unbeatable moment to attend this population (know concentrated in a geographical place) that historically has been under attended in the rural areas where they use to live disperse without access to social services provision. The city grown without planning, the neighborhoods are places taken by the migrant population, small streets lack of public services, clandestine connections to facilities, precarious housing are very common. Once they are an important group of people, demands start, and progressively they become obtaining access to facilities, social services, and so on. A very effective strategy. In the process, children are exposed to city; sometimes they (children under five years old) stay home alone because parents labour; sometimes they are working in the streets; have to walk long distances to the school; the number of kidnapping has increased as well as raping and child abuse. (Interview UNICEF staff member September 2014)

In Bolivia, a traditional misogynist culture persists where women are assigned a subordinate, traditional and dependent role, mainly the roles of reproduction and care of the family. According to the Human Development Report on Gender in Bolivia 2003 (PNUD): 'Bolivia treats men better than women'. The report continues:

> men receive more and better education than women, receive increased and better health assistance than women, and have the possibility to generate greater income while working less if we consider that women, as opposed to men, also have the almost exclusive responsibility for domestic work. (PNUD 2003)

Children and adolescents constitute almost half of the total population in Bolivia. National poverty coincides directly with their living conditions. While progress has been achieved in the areas of health and education for children, there is still much to be done to improve living conditions for Bolivian children.

According to a recent census, there are an estimated 1.5 million children aged under six in Bolivia. The majority of these children are living at risk of being regularly exposed to survival challenges. Daily life reflects the perception of children as being owned and their parents' property. A large part of the population still considers it normal to smack or beat children to discipline them and make sure they respect their elders. Many children lack a birth certificate. The causes of this lack of registry are of an economic and cultural character: the cost of obtaining a birth certificate is high, and there is a lack of information on the benefits of registering children. A child whose birth is not registered does not exist in the eyes of the state and therefore does not have access to the basic services and rights guaranteed by law. An estimated 616,000 children and adolescents are engaged in some form of work. The economic crisis, lack of employment and, definitively, low family income are only some of the reasons that oblige many children to work. These children are frequently exploited and work in dangerous and hazardous work places. Also, for many working means the children do not attend school. Less than half of the working children continue their schooling after they are 12 years, and around 5 per cent of children in Bolivia have never gone to school. On 15 July 2014, in response to this child labour crisis and surrounded by hundreds of children, Vice President Álvaro García Linera made the local newspaper and world news by signing a new legislation making Bolivia the nation with the world's youngest legal working age. Children as young as 12 can be legally employed, and those as young as 10 can be self-employed, as long as they are enrolled in school and have parental permission. The new law signifies a change. It recognizes child labourers and will give them a legal standing and support network within the framework of society. Many believe it is not necessarily a long-term, viable solution, but there is a practicality to the law. Within Bolivia there is a hard reality of children working, and this new law marks a change and a recognition of that reality, making the issue of child labour visible and real.

The city officials who invited me to research in the communities of La Paz are working hard to meet the needs of children, especially those who are facing hardships because they are living in the slum communities. With immense changes in social policy since the election of the first indigenous

president in 2006, progress may have been slow, but for the first time, all citizens enjoy a small pension and mothers receive special benefits to ensure their children go to school. The welfare funds the government has implemented have been reported to reach 3 in every 10 Bolivians, and poverty has gone down by 13 per cent since the national reforms were introduced less than ten years ago.

The three neighbourhoods that were the focus of the research study were all disadvantaged or slum communities on the very high reaches of the valley, close to the El Alto. The neighbourhoods were Cotahuma, Alto Tacagua and Munaypata. Cotahuma is one of the main districts or zones of La Paz and runs from downtown up the side of the valley. This district includes the neighbourhood of Alto Taca Gua. Alto Taca Gua is on the highest reaches of the valley and is only accessible via steps either from the valley below or by driving to the El Alto parking and walking down into the neighbourhood. The community Munaypata is on the same side of the valley as Cotahuma but is much further to northwest of the city. Munaypata is also on the highpoints of the valley and is bordered by the national highway that winds its way down from the airport and the El Alto towards the central city district.

Forced Urbanization in Kazakhstan

Kazakhstan is the ninth largest country in surface area in the world. The Kazakhstan environment is one of great variety and diversity. The terrain of Kazakhstan includes flatlands, steppe, taiga, rock canyons, hills, deltas, snow-capped mountains and deserts. The highest point is the mountain of Khan Tengri in the Tian Shan ranges, with an elevation of 7010 m. The lowest point is the bottom of the Karagiye depression at minus 132 m, which lies on the Caspian Sea, the site of some of the lowest elevations on earth. Many of the high peaks of the Tian Shan are snow-covered all year round and are the source of most of Kazakhstan's water in rivers and streams. It is the world's largest landlocked country, so these waters flow either into the Caspian Sea or disappear into the steppes and deserts of central and southern Kazakhstan. Three-quarters of the country is semi-desert or desert. Only 1.2 per cent of the land is forested with a decrease in 3 per cent of forest area between the period of 1990 and 2010.

Historically, the territory of Kazakhstan was inhabited by nomadic tribes. By the sixteenth century, the Kazakhs emerged as a distinct group, divided into three jüz (ancestor branches occupying specific territories).

By the mid-eighteenth century, the Kazakhs were facing encroachment from Tsarist Russia to the north and from China in the east. In order to fend off the threatening Kokand Khanate, the Kazakhs accepted Russian 'protection' in 1822, and by the mid-nineteenth century, all of Kazakhstan was part of the Russian Empire. Following the 1917 Russian Revolution, and subsequent civil war, the territory of Kazakhstan was reorganized several times before becoming the Kazakh Soviet Socialist Republic in 1936, a part of the Soviet Union. Kazakhstan experienced population inflows of millions exiled from other parts of the Soviet Union during the 1930s and 1940s, and deportees were interned in some of the biggest labour camps, including ALZHIR camp outside Astana, which was reserved for the wives of men considered 'enemies of the people'.

In 1947, two years after the end of the Second World War, the Semipalatinsk Test Site, the USSR's main nuclear weapon test site, was founded near the city of Semey. Kazakhstan declared independence on 16 December 1991, following the dissolution of the Soviet Union. The president, Nursultan Nazarbayev, has been the leader of the country since 1990. Nursultan Nazarbayev, who initially came to power in 1989 as the head of the Communist Party of Kazakhstan, has made significant progress to bring Kazakhstan into a market economy. When the Soviet Union collapsed in December 1991, Kazakhstan inherited 1410 nuclear warheads and the Semipalatinsk nuclear weapon test site. By April 1995, Kazakhstan had repatriated its nuclear warhead inventory back to Russia and, by July 2000, had destroyed the nuclear testing infrastructure at Semipalatinsk. As a site of the Soviet Union's nuclear testing programme, areas of the nation have been exposed to high levels of nuclear radiation and radioactive pollution. The total number of citizens exposed to radiation is said to exceed one million. The consequences of nuclear explosions in the Semipalatinsk test site are still experienced by several generations of citizens, and the consequences continue to impact on the health and well-being of its children. The country also hosts 30 uranium mines and a number of old and dangerous nuclear reactors and power stations that contribute to ongoing pollution.

Pollution from industrial and agricultural sources has damaged and contaminated many rivers, with a recent UN report stating that some industrial metals in river systems are 160 to 800 times beyond acceptable levels. Water supplies have often been compromised, the most visible being the degradation of the Aral Basin and the consequential drying up of the Aral Sea. Contamination and high salinity mean the small amount

of water that is left in the Aral Sea is no longer habitable. Wildlife throughout Kazakhstan is also in danger of extinction due to high levels of pollution, environmental degradation and the detrimental agricultural regimes introduced during the Soviet occupation that saw the Steepe transformed through large canal development for wheat and cotton production and the destruction of natural habitats of animal and vegetal species (Valantin 2016, 2017).

Astana, the home of the president, has only been the political capital of Kazakhstan since 1998 and is Kazakhstan's second largest city after Almaty. It holds the position as the second coldest capital in the world after Ulaanbaatar, Mongolia, with an extreme continental climate, warm summers and long, very cold winters. The population of Kazakhstan is approximately 17 million people. Ethnic Kazakhs represent approximately two-thirds of the total population and ethnic Russians around 20 per cent. This is a significant change in demographics from the time of Independence when Kazakh population was as low as 30 per cent. Over half of the population lives in urban environments, and the current rural population, like in many Western countries, is decreasing slightly every year. Children under 5 years make up approximately 10 per cent of the total population, children 0–14 years 25 per cent and under 18 around 30 per cent. This is a decrease from 2001, when children 0–14 years were only 27 per cent of the population. Kazakhstan is officially a bilingual country: Kazakh, a Turk language spoken natively by mainly the Kazakh population, has the status of the 'state' language, while Russian, which is spoken by most of the general Kazakhstanis, is declared the 'official' language and is used routinely in business, government and inter-ethnic communication. The country is a predominantly Islamic country with 70 per cent of the population being Muslim, with the second largest religious group being Russian Orthodox Christians.

Some of the key challenges for the general population that also have significant influence on children's health and well-being in Kazakhstan are environmental issues, in particular radioactive pollution. The gravest environmental threat from radiation is in the Semey (Semipalatinsk) region of the northeast, where the Soviet Union tested almost 500 nuclear weapons, 116 of them above ground (this is one of the cities explored in detail in Chap. 7). Often, such tests were conducted without evacuating or even alerting the local population. Although nuclear testing was halted in 1990, radiation poisoning, birth defects, severe anaemia and leukaemia are

very common in the area. The dangerously high level of air pollution in Kazakhstan, due to multiple sources, including various industrial enterprises and automobile emissions, is also threatening the health and well-being of Kazakhstani children. Harmful emissions have been found to have a damaging impact on the health of children, who are more susceptible to the long-term impacts of cancer, respiratory diseases, damage of organs and systems, reduction of total resistance and cardio-vascular diseases (Grossman 2005). The main sources of pollution are industrial pollution; production of crude oil/natural gas; manufacturing; production of materials for power; metallurgy; production/distribution of gas, electric power and water; automobile emissions; mining activity; transport and communication; and radioactive/nuclear testing. The main pollutants are dust, sulphur and nitrogen dioxides, hydrocarbons, lead, benzopyrene, formaldehyde, cadmium, iron, mercury and fluoric acid. Levels are highest in cities and industrial centres. In the past, the cities of Ridder, Ust-Kamenogorsk, Almaty, Zyryanovsk, Aktau, Shymkent, Taraz, Petropavlolovsk and Temirtau have registered the highest levels of air pollution. Another major environmental issue impacting on children's health is water pollution, with most of the water in Kazakhstan being polluted by industrial effluents, pesticide and fertilizer residue, and, in some places, radioactivity. Other issues impacting on children's lives that were significant at the time of my visit to Kazakhstan and had become visible due to the high levels of poverty and vulnerability (especially in the regional cities) after independence include the institutionalization of children, the lack of adequate kindergarten and childcare facilities, children's high mortality rates due to minimal health services and the lack of support for children with special needs (Malone 2011).

Kazakhstan became a member of the United Nations on 2 March 1992 and signed the convention on the rights of the child in 1994. The UNICEF Child Friendly Cities initiative started in 2006 in the Republic of Kazakhstan as the means for creating an environment where cities would begin to value the importance of implementing strategies that addressed the rights of the child. The UNICEF country office in Kazakhstan acts as a central technical advisory body to the national government and in the promotion and implementation of the CFCI. The Child Rights Protection Committee was set up in 2006 through the Ministry of Education and reports directly to the Minister. They are the main national advocates for child-friendly cities. The Kazakhstan Child Friendly Cities research project

was implemented throughout 2014. Funded by UNICEF Kazakhstan, it was a child-friendly participatory research programme engaging 177 children in research about their lives in the cities where they are living. The study was conducted in four cities of Astana, Semey, Kyzylorda and Aktau, with approximately 40 children from each city being involved.

Conclusions

As the world continues to urbanize and the impact of the Anthropocene is still being heralded as central to our shared scholarly concern, the challenges of sustainability and the battles of the resilience of humans and non-humans will be increasingly concentrated in cities, particularly in the lower-middle-income countries where the pace of urbanization is fastest. While the limitations with the theories and practice of sustainability are becoming more evident, there is a desire to rethink or consider rejecting the idea of sustainability altogether. Arias-Maldonado (2013, p. 430) writes:

> sustainability should be reframed in a twofold way. On the one hand, it has to confront the challenge involved in the increasing realisation that the relationship between human beings and the natural world is much more complex and nuanced than expected. The notion of hybridisation sums up a reality that is currently being explored across a wide range of scientific disciplines. On the other hand, the fact that we can be more flexible regarding the conception of nature involved in our view of sustainability surely means that we ought to be so. Thus we should adopt an understanding of sustainability as a general, pluralistic, open principle.

Research on children in cities continues to reveal that large sections of cities are effectively out of bounds for children. Children in cities often lack the freedom to explore or participate in their urban environments because of a paucity of places where they can be safe. There also continues to be significant evidence that poverty and disadvantage are having long-lasting impact on children's lives, and listening to their stories of how growing up in cities is impacting is central to discussions on why and how humans as a species should reconsider a more harmonious relation with the planet. Children face serious danger from pollutants and pathogens in the air, water, soil or food, and especially for the world's millions of street children who are exposed to a lack of health services, the danger of traffic accidents,

child trafficking and abuse and finding secure and safe places for refuge (to play and encounter others) will continue to be of critical importance. All of these vulnerabilities are compounded by the detrimental impacts of climate change and other global disasters predicted to increase in the future.

Research continues to support that even less than a generation ago, children in many highly developed nations were far more likely to engage in activities in their own neighbourhood, to build relations with their place. When asked to reflect on their childhood, parents usually remember having far more freedom in their urban places than their own children have today (Malone 2007). Partly this is due to children being engaged in work, school or in adult-organized activities such as sport, music, homework. A retreat from playing outdoors, as we will find in some of the stories in this book, is also partly due to the increasingly poor quality of city environments to provide healthy, safe places for children. The abandonment of our relation with the earth through the erosion and degradation of green spaces; the loss of respect and engagement with other species because of the increasing imposition of transforming land for agriculture, housing and industry; and the increased fear of 'stranger danger' child abductions and child trafficking have all contributed to a catastrophic change in children's capacity to live well on the planet. While evidence reveals this lack of active engagement with their city has detrimental impacts on children's individual physical and mental health, it also has the prospect of limiting young people's environmental competence, sense of connectedness and empathy with the diverse global community and the more-than-human world including the inter-species companions we share this planet with. It is believed this disassociation of humans with the planet could ultimately undermine any step forward in our educational initiatives to support children and young people to be the future stewards of the environment. That is, without the support of these young people, the critical qualities for a population of innovative and humane builders of sustainable cities now and in the future will be lost.

While it is generally believed that urban children are mostly better off than their rural or country counterparts, this is not true for the hundreds of millions of children living in cities in low-income nations, in slums, in poverty: 'Without adequate planning and good governance, poor urban area can be among the world's most life-threatening environments' (Bartlett 2008, p. 502). The consequences of living in slums, or even in low-income households in high-income cities, have disproportionate

implications for children who are the most vulnerable to inadequate planning. This vulnerability is likely to be even further intensified in the future by the worsening effects of climate change as it continues to undermine the precarious position households already find themselves in. In this chapter, I have identified the very precarious position children in cities have found themselves in the past and in the present, and are likely to continue to be in the future. This vulnerability of children is set to increase if the consequences of population growth, intensified urbanization in low-developed countries and the continued construction of urban slums are added to other global phenomena such as climate change, global economic instability and social breakdown.

For these reasons, research projects focusing on sustainable cities for children such as the UNICEF Child Friendly Cities have been central for providing a model of how to engage with children most at risk in cities, giving them an opportunity to share their experiences. However, what this work didn't do was consider the connections and configurations of the child as human in an entangled world, in ecological community with others. It didn't take into account the 'entangled materializations of which we are part, including new configurations, new subjectivities, new possibilities' (Interview with Barad, Dolphijn and van der Tuin 2009). These earlier projects were central to how I have come to compose the tools used to collect data with children. But on the whole due to the limits of my audience, much of the field notes, observations, interviews, photographs, feminist ethnographic writings and images that I composed while in the field have lain silent and dormant. It is here, in the following chapters, that I have found a different story of children in cities, a story that matters in the Anthropocene.

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CHAPTER 4

Ecologies: Entangled Natures

> [i]f our species does not survive the ecological crisis, it will probably be due to our failure to imagine and work out new ways to live with the earth, to rework ourselves and our high energy, high consumption, and hyper-instrumental societies adaptively…. We will go onwards in a different mode of humanity, or not at all. (Val Plumwood 2007, p. 1)

Cities are central sites for reconfiguring, reimagining (Plumwood 2007) human–nature encounters in the Anthropocene. The city constitutes a powerful imaginary of the human–nature disconnect and therefore brings credence and attention to our seemingly de-natured lives. Cities represent the effects of the human dominance over 'nature': humans in control, taming and managing the wildness of the natural world, keeping nature out. Earlier in my research, I remember writing about 'urban sustainability' as having the potential to disrupt the nature–culture divide, by offering up visions of a 'balance', how humans and non-humans could co-exist in eco/green/biophilic cities. Guided by theories of biophilia, my designs of an imagined eco-green cities were based on the hypothesis that humans (and particularly children) possessed an innate desire to seek close relations with nature and other forms of life, and if only we could 'let' nature back into cities, we could nurture this desire. Humans (especially children), in this biophilic world, could be re-constituted, re-inserted with and re-embedded as a significant other in the natural world. Biophilic

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cities would be abundant with 'nature'; cities could be places where humans nurtured protected, restored and grew nature. Children could play, find refuge and develop kin relations. They would look different; the presence of an abundance of plants, would foster deep connections and daily contact between the humans and the non-human world. Such aspirations of a natured urban sustainability have been increasingly augmented, or framed within neo-liberal agenda of sustainability, by notions of 'resilient cities', 'liveable cities', 'healthy cities', 'sustainable cities' and claimed through human ingenuity 'human smartness', in which human agency became at best assertive, reactive, or even dissolved within a process of recursive co-adaptation. My growing suspicion of the restorative value of this anthropocentric environmentalism informing an urban sustainability movement (of which biophilic theories were deeply located) was based on its seemingly limited and narrow conception that nature was (only) of value because of its 'material and commodity benefits' for humans (Kellert and Wilson 1993). And we 'humans', although valuing the potential of nature for our own health and longevity as a species, weren't nature. Around the world, big actions, by corporate companies to build shining examples of 'green' skyscrapers in high-income nations, didn't fit well with my experiences of children thrown together in the messy, dirty and untamed environments of slums, the places where we know the majority of the world actually resides. As I came to spend more time with children in these 'brown' communities, I was critically aware of the limitations of Western-centric definitions of deep ecology, environmentalism and gaiaism that felt to intensify the cartesian divide of nature–culture and produce a sanitized view of nature controlled once again solely for the benefit of the human species. Then I read *Staying with the Trouble* by Donna Haraway. In a passage in Chap. 2, she unpacks Isabelle Stengers work on the intrusion of Gaia from her writings *Au temps des catastrophes* (2009) and the relation of *Gaia to Chaos* (see Prigogine and Stengers 1984), Haraway concludes with:

> Earth/Gaia is maker and destroyer, not resource to be exploited or ward to be protected or nursing mother promising nourishment. Gaia is not a person but complex systemic phenomena that compose a living planet. Gaia's intrusion into our affairs is a radically materialist event that collects multitudes. This intrusion threatens not earth itself – microbes will adapt, to put it mildly – but threatens the liveability of earth for vast kinds., species, assemblages, and individuals in an 'event' already underway called the Sixth Great Extinction. (Haraway 2016, p. 43)

Gaia theory, for example, when first proposed in the mid-1970s by James Lovelock, described the planet and all its cohabitants including the environment as acting as a single, unified, self-regulating system. This system included the near-surface rocks, the soil and the atmosphere. This theory then evolved to present the role of humans as a keystone species whose role was to accomplish a global homeostasis. Ecosystems are huge and complex. They contain networks of animals, plants, fungi and various microorganisms. All of these life forms interact and affect one another. Having some form of equilibrium, this balance, was the focus of a green biophilic cities through sustainable development. But even Lovelock, who dreamed the gaian vision of a harmonious world, has been documented as saying greening our cities is far too late now to have any long time value. In a speech to the Royal Society, on 29 October 2007, Lovelock finished with:

> Perhaps the saddest thing is that if we fail Gaia will lose as much or more than we do. Not only will wildlife and whole ecosystems go extinct but in human civilization the planet has a precious resource. We are not merely a disease; we are through our intelligence and communication the planetary equivalent of a nervous system. We should be the heart and mind of the Earth not its malady. Perhaps the greatest value of the Gaia concept lies in its metaphor of a living Earth, which reminds us that we are part of it and that our contract with Gaia is not about human rights alone, but includes human obligations. (retrieved http://www.jameslovelock.org/page24.html)

In the posthuman world of new materialism, actor-network theory and posthumanism, many theorists posit that creativity and agency will still exist, but that they will no longer be the property of humans alone (Chandler 2013). Rather agency, and in this case children's agency, to respond to the environmental crisis will become a product of the assemblages, associations and relationships through which they are connected and attached to the more-than-human world. By moving away from an explanation of children's environmental encounters from a humanist perspective where we: 'understand and act in the world on the basis of our separation from it – articulated in the constraining, alienating and resentment-filled modernists divides of human/nature, subject/object, culture, environment', a posthumanist approach allows a consideration of how we, 'should develop our understandings around our attachment to the world' (Chandler 2013, p. 516). That is,

> To respond to the big picture challenges of sustainability… twenty-first century children need relational and collective dispositions, not individualistic ones, to equip them to live within the kind of world they have inherited ...They will need a firm sense of shared belonging and shared responsibility … They will need to build upon a foundational sense of connectivity to this same natureculture collective. (Taylor 2013, p. 118)

Urban Childhood Nature

Adults, when asked to imagine themselves as a child in a place where they felt happy, safe and secure, will frequently describe climbing trees with friends, building cubbies, playing in the playground, mostly without adults around: an idealistic, romanticized view of childhood, where they reminisce of their own childhood freedom and bemoan its loss for children growing up in the twenty-first century (Malone 2007). In these discussions of a past nature-filled childhood (which is now seemingly lost), contemporary children are often viewed as the most disadvantaged. This disadvantage is often expressed in terms of the lack of specific planning for children's 'nature' needs in neighbourhoods and villages and the consequences of this lack of consideration for children's lives (Malone 2010). City children, in particular, are often perceived as most disadvantaged—confined to indoor environments that provide little opportunity for self-discovery in the outdoors and all the benefits those experiences would have on their health, learning, relationships and so on (Malone 2010, 2015a, b; Malone and Waite 2016). Proponents of child-friendly cities say society has a responsibility to uphold a child's right to a safe and healthy place to live where they have free access to nature (UNICEF 2001). But rather than just a 'right' or legal obligation, it's important to consider the significance for children and childhood if children aren't able to experience everyday encounters with natural places. And while it is true that around the world, whether in industrialized or developing cities, that many children are growing up in crowded, polluted environments, research indicates regardless of their surroundings, children will seek out even the smallest of limited natural encounters for nurturing their ecological selves (Malone 2001, 2007, 2008, 2013). In this way, children's encounters with nature in 'place' are not only inherently valuable for their sense of well-being and health, but are central to how they learn what it means to be human, a human who is in relation with other humans and the non-human world. Places shape children and children shape the

places. 'The experience of place cannot be separated from the person [other objects] who live in it' (Raittila 2012, p. 272, added bracketed words).

Research in past years on children's nature place encounters has revealed that regardless of specific cultural nuances, the opportunity to engage with the non-human world within the place and spaces where a child lives influences a child's everday life experiences (Chawla 2002; Jack 2010), their forming of an ecological identity (Stone 2005) and their potential for environmental learning (Malone and Tranter 2003). Places found close to a child's home, for instance, can offer a set of opportunities, phenomena and events that support children developing their sense of being in ecological community with others, a kind of 'throwntogetherness' or being with, and becoming, something else. These ecological 'entities' that children encounter that make up their world are often viewed spontaneously by a child from both a functional and a relational point of view. Functional in a sense they can explore the potential for these natural objects/entities for play, learning, reflection, exploration, to expand their own ecological identity; and relational as they come to recognize as beings in common, they are not exempt or exceptional to the ecology of the planet.

'Place settings' help to define the way 'place' is encountered by children through the 'intra-actions' between them and the environmental 'objects' contained within a place. The particular objects or what in the past we also referred to as affordances (objects that have particular agency) support or enhance different intra-actions between human and non-human entities. For example, a remnant piece of forest may shape a series of encounters where boys' bodies are moving quickly, a game of tag or chase with friends or dogs, a place to discover ants nesting, to feel tree roots pushing up the soil. Alternatively, a child may come to this same 'place' to find refuge or sanctuary to sit quietly to be 'held in a place' as an actor intra-acting with others in those settings. The objects, the setting (earth, sticks, steep land) and the bodies (potentially child, dog, insects, adult) have materiality, and this material matter has agency to shape what conspires between it and other matter. By noticing the 'place actor setting' it allows us to imagine how a place is the setting within which these actors take up agency through a variety of intra-actions.

Uzzell (1999) in the past has also argued, in relation to children and their village or neighbourhood environment, that it is helpful to consider the idea of territoriality when describing children's place encounters. The concept of territoriality is intimately related to how humans and

non-humans come to use an environment, how they organize themselves in relation to place and how they come to take ownership, set up boundaries, give meaning through their attachment to a place. Territoriality plays a critical role in developing an animal's sense of connection and solace within a place. According to Uzzell (1999), marking out territories allows children to have greater identification and feelings of security within a place, which can lead to a greater sense of capacity to influence an environment, to embed oneself within it, and to form an ecological identity. In place-based research, a relationship between territoriality and place attachment has been identified. Scannell and Gifforde (2014, p. 26) have written: 'places to which one is attached are often a safe haven where one can retreat from threats, engage in problem-solving, and gain emotional relief'. They recognize the way children alone, or with others, often retreat to 'favourite places' in order to regulate or explore their own emotions. They also support the view that building 'kin' relations with a place (trees, birds, mountains) can be associated with safety due to potential to withdraw (whether real or imagined) to these places as a means of sanctuary. Often, this place can be recognized due to a child's desire to regularly revisit a particular place, by themselves or with others, over time. Fried (2000) says creating a place, often a natural environment as a safe haven, has a special function for children who may be coping with numerous stressors in their lives. A more-than-human perspective on the affordances or attachment of children to a place recognizes that a place does not function solely through a one-way exchange between the child and the characteristics of its material objects. Children become part of the place with and through their relations with matter, by sensing ecologically the other they are being shaped and are shaping each other through past and present intra-actions. I am reminded by Barad (2014) that '(p)henomena are not located in space and time; rather, phenomena are material entanglements enfolded and threaded through the spacetimemattering of the universe' (p. 182).

When children describe places, they describe where they are, or would like to be. The stories of places that matter to children are often in natural environments. When I research with them, they take photographs of trees, flowers, the mountains, the rivers, the ravines, their dogs and the sun shining through the laneways. This chapter on nature in the cities where children are growing up draws on data provided by children from the communities in La Paz and from a number of cities in Kazakhstan. The children provided drawings and photographs of their neighbourhoods and engaged in interviews and focus group discussions where they described

their visual data and spoke about their experiences. In the discussions, the focus is on the neighbourhood, but for many children this also includes wild nature, being out of the streets and into leftover pieces of land where 'nature' might be viewed as uncontrolled or unrestrained by the demands of an ordered city. For the Bolivian children, this includes the upper reaches of the valley in La Paz. Out of sight of their homes and neighbourhoods, they take us to the quiet hidden places where they seek refuge. They tell me of the games they play, the stories they share and how the environment has changed over time. The river that used to flow but after the bulldozers demolished the forest and houses were built, it stopped. They show me the artificial grass on the playing fields and how they long for real green grass so they can do cart wheels and not skin their knees. In Kazakhstan, there are not many places where children can find 'wild nature', yet they tell me of the 'datcha' or country summer shacks on the edge of the city where they can go either in reality or in their imagination to play among the flowers and animals that reside there. Using the recent theoretical attention given to deconstructing the nature/child binary, I will, through this chapter, seek to reconfigure the child in nature debate in particular to identify that the Western-centric view of child–nature relations is romanticized in terms of it being narrow and unrealistic.

When theorizing child-nature encounters with a posthumanist lens, I am seeking to unsettle the idealized view of child–nature encounters, a view where children innately meet nature as an inanimate object, a resource for their aesthetic pleasure or as a commodity. I use the term ecological posthumanist communities to unsettle and bring attention to human/nature/culture nomenclature, 'facts' (scientific) and 'values' (ethical and political) to interrupt and bring attention to what it means when human beings and other are knotted together. I am, deliberately in this analysis of my past research work, both eroding and complicating these very 'idealized' categories. As such child–nature connections are not to be thought of like bridges connecting separate, well-defined regions, but more like the connections with/in the human body itself, between its 'own' cells and the trillions of microorganisms of more than 1000 different species, parasitic, commensal, and symbiotic, that inhabit and compose it. For a human being is itself already a complex ecological community, a mixture of different species, things, thoughts, meanings and values. Emphasizing such connections begins to deconstruct the ontological certainties and absolute distinctions that have supported the belief that humans were somehow exempt from the liveliness of the world.

In the following ecological posthumanist stories of children's lives, I am seeking to make sense of the encounters children have within the confines of the urban environment they find themselves. The moments where they seek out and encounter the objects from the physical environment: some are natured things—'plants', 'animals', 'weather', 'mountains'—while others are objects derived from the human interventions that are shaping their lives. I start the chapter with some further unpacking of recent debates in the child–nature literature.

Children on the Edge of Nature

We are sitting together on a set of table and chairs constructed for small children. I feel uncomfortable, unstable and my knees are bent. I am slightly hunched over so I can watch attentively at the actions of the small child next to me, without getting too close. Sara has the packet of developed photographs from the disposable camera she handed to me a week ago. She had run up to me with an air of excitement when I had arrived in the kindergarten room. She wouldn't be disappointed. I had the photographs. She opens the packet and starts to methodically pull each one out. She pauses at each, looks at it for a while, then places it on the table in front of her. She stops at one photograph and holds it in her hands. Putting aside the packet with the unviewed photographs still contained inside, she holds the photograph in both hands. From where I am sitting I can see the photograph she is holding has the trunk of two trees and the perspective is as if it was taken looking up into the tree from the ground. I pause and allow her to guide the process. 'I took this in the park,' she says quietly, almost like she is speaking to herself. I nod my head. 'I am a leaf fallen from the tree.' She turns her head to see my reaction. I nod again. She pauses, still looking at me. 'From that tree', she says and points to the tree on the right of the photograph. She then gets off the chair on the floor beside me and lies down on her back. She is once again becoming a leaf. I am sitting still, quietly watching. She is still, quietly being a leaf (Fig. 4.1).

In recent years, there has been a significant return to the enduring sentiment that providing opportunities for children to be immersed in 'nature', particularly in the places close to where they live, is an essential way to support children to reconnect with the planet. This sentiment is premised on the argument that a nature–child connection is essential for their health and well-being and their potentiality to be environmental stewards. Unless children are re-natured, both these would be compromised.

Fig. 4.1 I am a leaf fallen from the tree (Source: Photograph taken by Sara, age 4, Melbourne, Australia)

This is a significant challenge in the area of sustainability which has always sought to consider ways to encourage and entice the human moral desire to 'conserve nature', to 'protect animals' and to be politically active. Big-ticket environmental issues such as limits to production, climate change and animal conservation are the backbone of sustainability, and to be able to 'overcome' these issues, a well-educated and willing community of young people has always been viewed as essential. These arguments have all been central tools for encouraging researchers to consider ways to *empower* children to give children *agency* to make a difference through community actions or city level policy. In most of these past research studies on children in city environments, the focus has always been on the agency of humans, with children being active participants: recycling in homes, planting trees in parks, cleaning up rubbish and restoring the quality of waterways. My earlier studies as identified in the first chapter are examples of this type of participatory work that focused on pragmatic outcomes to empower communities, especially children to make an environmental difference in the places where they lived or to take them to specific 'natured' environments. This approach has been supported through many of the recent studies by agencies such as the US-based child and nature network where the focus is on producing opportunities to enhance

children's experiences and capacity to encounter 'real' nature. In their fervour to improve degraded environments and deprived children, what they haven't done is look closely at the relations of those entities and things that surround and embrace children in the urban places where they live. Questions about what the meanings of those child–nature encounters are or even to acknowledge that children, no matter where they are (in slums or in a conservation park), are engaging to a range of different types of 'nature' relations have been missing from the literature.

For example, in 2005, Richard Louv published his book *Last Child in the Woods*. Supported by the earlier work of Kahn and Kellert (2002) and others around biophilia (Wilson 1984), he argued that children have an innate desire and connection to nature and, through lack of natural engagement, suffer as a consequence. Louv (2005) in this work used the term *nature deficit disorder* for the first time to describe what he believed was the impact of children's disassociation and lack of time spent with nature. This idea of *nature deficit disorder* has become central to much of the marketing around a new child–nature movement, particularly in Australia and the USA. One aspect of this work by Louv, and what some might view as a limitation, is its very narrow definition of what constitutes 'nature'. According to Louv (2005, p. 9), the definition of nature as used predominantly in his campaigning for children in nature is narrowly 'the outdoors, anything that is natural – not human-made in the physical environment'. Louv (2005, p. 9) writes:

> … when I use the word "nature" in a general way I mean natural wilderness, biodiversity, abundance – related loose parts in a backyard or a rugged mountains ridge. Most of all, nature, is reflected in our capacity for wonder.

So a city according to his definition has pockets, spaces of wild nature possibilities. It exists out there, outside of the human, and the less human impact the better—untainted or pure nature.

Romanticizing and Reifying the Human–Nature Split

Previous studies on children's perceptions of nature in urban environments reveal that unlike some commentator who try to simplify and commodify the very complexity of child–nature relations—these relations can often be uncomfortable, difficult and tricky encounters. The teenagers in

Wals' (1994) early study on perceptions of nature (one of the first ever in the field) defined their view of 'nature' as a threatening place and validated an anthropocentric desire to control and tame the wilds. In his study, the students' perception of nature was based upon 'a combination of their own fantasies and the unspeakable acts that occur in local parks, which are often well documented by the media' (p. 132). In their home neighbourhood, the students feared the forest and trees. One student remarked that they would prefer forests with 'just enough trees to give you shade, but not enough for murderers and rapists to be able to hide behind them' (p. 135). Wals' (1994) results are consistent with other research studies where 'nature' (including animals) is viewed as both threatening and fascinating (Evans et al. 2007; Phenice and Griffore 2003). Hordyk et al. (2014), for example, reporting on their study of immigrant and refugee children in Canada, revealed that for children coming from developing nations, '[n]ature was not a utopian ideal waiting to be experienced by children' and 'human and animal predators made walks in a forest dangerous past-times' (2014, p. 6).

Dickinson argues that (2013, p. 7) '[f]all-recovery narratives', like those espoused by Louv and others', can be problematic in how they reify the human–nature split, obscure environmental justice, influence irresponsible behaviour, and normalize contemporary conditions and relationships'. What she means by fall-recovery narratives is a form of reminiscing about the past that has been sanitized in order to present a specific point of view. That is, for example, the view that the past was always 'good' and 'virtuousness' particularly in terms of the child–nature relationship and that there is a desire to come back to this as an idealized state. The past generation is sentimentalized as having grown up in a utopian dream in which all children had a childhood where they were safer, had more freedom to be 'children', were left to explore nature (particularly wild nature) without adults around to police or regulate their experiences. This emphasis on the pure romantic past life of children normalizes the perfect childhood, a kind of Disneyfied childhood where nature was accessible to all, where the wild meant freedom and where the dominant shared parenting style was, what Tim Gill (2007) might call, 'benign neglect'. The desire, therefore, of the child–nature movement based on this 'romanticized amnesia' is *not* to consider a new imagining of children's encounters with nature as relevant to the current challenges of the Anthropocene and the impacts the modernist divide between human and nature has produced, but to look to what we have lost and conjure up possibilities to return to

our past as our new imagined future. The mantra for the child–nature movement (and ultimately influencing how to plan for natured places in children's lives) then becomes fixated on looking back and attempting to return to a past state in order to have a 'reunion of humans with the rest of nature' (Louv 2011, p. 3). This return to a 'better' nature relation is contrived on an assumption that past generations had a closer and more intimate relation with the planet and 'de-emphasises' according to Dickinson (2013, p. 7) 'a long history of environmental degradation and disconnectedness'. This notion, which I will show in my research throughout this book, ignores the majority of the world's children's real (rather than imagined) childhoods. Essentially, embodied childhood encounters with the 'natural world' are not always as restorative, healthy or spiritually uplifting as some nostalgic stories have seduced many to believe. The world 'outdoors' can sometimes be a highly entangled dirty, messy, harmful place, and if humanity is to address the predicament it finds itself in, then I believe it should be focusing on new ways of considering our relationship with the environment rather than reminiscing on an imaginary past that a privileged few may have enjoyed. For Dickinson (2013, p. 7): 'Fall-recovery, then, is a subjective cultural creation in how it positions the *kind* of nature and childhood to which humans should return'. A child–nature reconnect as purported by many in the child in nature movement is in danger of continuing to reinforce the human–nature divide that continues to position humans as 'exceptional' and outside of nature, a sentiment that some may say has set humanity on its current destructive path.

This focus on the human subject to the detriment of 'other' possible agentic subjects in the ecology has seen a very narrow view of child–nature relations. Taylor (2013, p. 66), describing the recent conversations around other possibilities to expand the view of the child nature collective, states:

> such conversations have constellated around the challenge of thinking differently about nature, as well as what it means to be human. Those involved have undertaken to reconceptualize what counts as nature outside the bounds of the nature/culture divide, to build connections rather than rehearse separations.

Entangled Nature in La Paz

The children in the neighbourhoods high on the El Alto have tremendous views across the valley all the way to Mount Illimani. Mount Illimani is the highest mountain in the Cordillera Real, a sub-range of the Andes, and

stands at 6438 metres above sea level. It lies south of La Paz at the eastern edge of the Altiplano. With its snowed-capped summit visible from across the city of La Paz, it acts as a significant landmark and its connection to the lives of the inhabitants of the city and the surrounding countryside is deeply entrenched in Bolivian heritage and culture. Bolivia is a landlocked country separated from the Pacific Ocean by Chile. Bolivia had a coastline, but its former coastline is now Chilean territory. The Bolivian terrain includes the rugged Andes Mountains, within which the highland plateau where La Paz and Lake Titicaca (the world's highest navigable lake) are located. There are also the rolling hills, large expansive rivers that flow into the lowland plains of the Amazon Basin. Some of the major environmental issues facing the country include the clearing of land for agricultural purposes and international demand for tropical timber, both of which are contributing to deforestation, soil erosion, desertification, loss of biodiversity and industrial pollution of water supplies used for drinking and irrigation. The city of La Paz is located in west-central Bolivia, 42 miles (68 km) southeast of Lake Titicaca and is at an elevation of between 10,650 and 13,250 feet (3250 and 4100 metres) above sea level. This makes it the highest national capital city in the world. La Paz is shadowed by a number of mountains, including the Illimani (guardian of La Paz), Huayna Potosi, Mururata and Illampu. On the western side of the Altiplano divide, about an hour to the west of the La Paz, is the site of the tallest mountain in Bolivia and the ninth tallest mountain in the Andes, the Sajama Volcano.

The city of La Paz is built in a canyon created by the Choqueyapu River (now mostly built over), which runs northwest to southeast. The city's main thoroughfare, which roughly follows the river, changes names over its length, but the central tree-lined section running through the centre of town is called the Prado. Mostly middle-class residents live in high-rise apartments near the centre of the city around the Prado. The houses of the upper-class citizens are located in the lower greener neighbourhoods southwest of the Prado at the lowest altitude. The surrounding steep valley hills are densely packed with brick houses of the low-income and slum dwellers. Here the altitude is the highest, the air is most polluted and the land is most unstable. Bolivia is one of the world's smallest contributors to the emissions which cause climate change. It is responsible for 0.04 per cent of global carbon emissions, yet the effects of climate change are already a reality in Bolivia. This has led Bolivia to play an increasingly forceful and prominent role in international climate change negotiations. Like many countries in the world there are already signs of the

environmental and social impacts of climate change, with the communities that are already in situations of poverty and vulnerability most likely to feel significant effects of climate change. One example are rises in near-surface temperatures that have led to glaciers melting in the Bolivian Andes. In the Cordillera Real, the country's main mountain chain, glaciers have decreased by 40 per cent of their total volume from 1975 to 2006. This has significant effects on water supply as well as electricity produced by hydropower.

> The Tuni Condoriri glacier, which provides the water supply for Bolivia's administrative capital La Paz and the neighbouring city of El Alto (together accounting for around 2 million people), is expected to disappear partly by 2025 and fully by 2045. (taken from the website http://www.cambioclimatico.org.bo/).

A Child's View from the El Alto

For the children in the neighbourhoods of La Paz these global issues of climate change and its likely long-term impacts on their lives seem a very far distant future. A focus on survival in the city means they rely heavily on the everyday places they encounter in their environment as the means to provide a sense of connection to their past and present and to sustain them in a variety of ways. Mount Illimani rises above them and features heavily in their real and imagined natured lives. There seems not to be a view of the valley where the photographer is not drawn to its magnificent presence in their lives.

Fernando

Fernando, is a boy aged 11 from Munaypata. He draws a picture of his neighbourhood, I can see a street of high-rise buildings and in the background, looming, is Mount Illimani (Fig. 4.2).

He also draws a picture of his dream place, this picture has two mountains: one with the houses in small lines on the top of the mountain but all around this mountain are many trees. In his dream drawing, we can see that the mountain is all covered with trees and there is no sign of a city or urban life. A rainbow illuminates the sky and connects the mountains and looping road much like the national highway running through his neighbourhood can also be seen (Fig. 4.3).

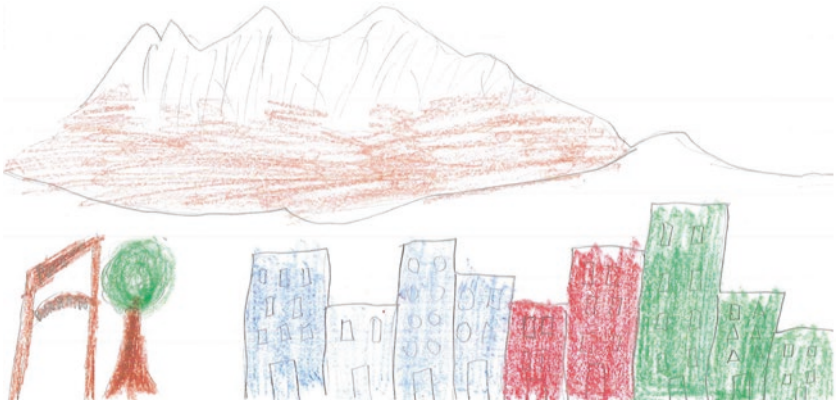

Fig. 4.2 Neighbourhood drawing by Fernando, age 11, Munaypata

Fig. 4.3 Dream drawing by Fernando, age 11, Munaypata

He describes his drawing to me: 'I like to see my area green. I am inside in this picture. I don't go out by myself. I go out on weekends. I like to walk. I don't like cars. I like everything that is natural. I like rainbows. When I went to Copacabana I liked seeing rainbows. I like walking through the woods because it is like a jungle.'

Adda and Luz

Adda and Luz are aged 12 and both girls. Adda lives in Munaypata, and Luz is in Alto Taca Gua. Adda draws a dream picture, her imagining of a future focuses on living close to her beloved Mt Illimani. 'Mount Illimani is the hill that I most like. I would like there to be less houses and more parks and flowers. In my dream there are no people because they are all in their houses. I don't want people to fight among themselves and I don't want there to be thieves' (Fig. 4.4).

Adda includes a photograph taken while in her neighbourhood, it features the views across the valley to the mountains. 'The view is the most beautiful in the region; even foreigners come to take photos of the landscape,' says Luz when we talk together. 'My photograph is of Mount Illimani. Illimani cannot only be seen from this area, it can be seen in lots of places around the world, in all the countries. I like Mount Illimani. But it is the rubbish that contaminates the environment and is what I don't like about our place. People dump rubbish everywhere and the rubbish bins are in vain because they don't use them because I don't know why but they want to contaminate the environment. I also see when I am walking around that people burn things at the river edge, they burn clothes, rubbish and other things that pollute the environment' (Fig. 4.5).

Fig. 4.4 Dream drawing by Adda, age 12, Munaypata

Fig. 4.5 Rubbish and waste in the environment (Photograph taken by Luz, aged 12, Alto Taca Gua)

Norah

Norah comes up to me with two of her favourite photographs. Norah is only nine years old and, like Luz, lives in Alto Taca Gua. She was one of only a few girls with Luz who participated from this valley top neighbourhood. Unlike her brother, she has much less freedom to move around her neighbourhood, so her photographs and drawings are more intimately connected to the area close to her home. She describes her neighbourhood and her photograph of her area this way: 'I like it when my house is surrounded by flowers and with the mountains, when the sheep are in their coral and the sky is blue and when it is colourful. I like all types of animals'. Her photograph provides us with a unique view of the mountain and La Paz from her backyard. 'I often come out here to stand just so I can watch the sun disappearing over the mountain and the shadows creep over the valley. Then I must quickly go inside and prepare the meal for my brother. My house has more than one room, it is very big. My dog loves on street and takes care of me a lot' (Figs. 4.6 and 4.7).

Fig. 4.6 Photograph taken by Norah, aged 9, Alto Taca Gua

Fig. 4.7 Neighbourhood drawing by Norah, age 9, Alto Taca Gua

'I like the trees that are in my neighbourhood, what I don't like is that people throw their rubbish in the street. I like to play with my friends in my neighbourhood. Sometimes I am afraid to be in my neighbourhood because there are thefts. I like to watch the aeroplanes fly over. I like it when my house is surrounded by flowers and with the mountains, when the sheep are in their coral and the sky is blue and when it is colourful. I like all types of animals. I like the trees that are in my neighbourhood, what I don't like is that people throw their rubbish in the street. I like to play with my friends in my neighbourhood. Sometimes I am afraid to be in my neighbourhood because there are thefts. I like to watch the airplanes fly over my neighbourhood.' She then shows me a photograph that has the gardens around her house. 'I like this photo because it has a garden and many trees. I like flowers of all colours, red, yellow, white and pink. They are also flowers that have fruit and they have prickly pear and soon they will be able to be picked, but these flowers have wire fences this is so they can't be pulled.'

Raul, Diego and Eduin

'We have various friends in the neighbourhood, we call, whistle or yell for them and then, I mean the dogs as well and the birds, and we all go up to the sports field together.' Raul who is 11 years old and lives in Cotahuma, the neighbourhood close to my hotel. 'We stand there, we sit there. It is more fun in the rain. We slip, we get dirty, it's funny, we fall over and in this place it's like a jungle with trees, with mountains. We go to play in this place we fall out of the trees and nothing happens, we climb to the top. You can see my house from the sports field, where we go to play. Where we go and play in the trees we climb to the top of the mountain and we can see everything. Here are some tuna to eat, the small ones are sweet, we take sticks and we catch them. We go by walking. I know it all, I know everything about it.'

I ask Raul, 'Has your neighbourhood changed much from when you can remember?' 'Yes, before this place didn't have walls, the house where we lived, was all downhill slope, and everything here was forest, it was like a jungle, full of trees and all the tractors went in and they made it all disappear now there are only houses and they are putting more there. I liked it better before it was more fun for us we played hide and seek in the forest areas with trees we could get there quickly and easily find places to hide. Now we have to go higher up because that's the only place with trees' (Fig. 4.8).

Fig. 4.8 Photograph taken by Eduin, age 11, Taca Gua

Eduin is 11 and Diego is 10 years old. They are both from Taca Gua. They both tell me about the trees and flowers close to their homes. Eduin's photographs look like flowers in garden. 'I took this photo because I like the garden beds, these are on the stairs near my home. I like the flowers and it is near my house. We have to provide water for the flowers so we can't have too many, we need the water also for ourselves. You can also see these are my aunts and they are cooking out in the garden.' Diego then also tells me how much he likes the trees close to his house: 'I like the tracks, the trees, and the landscape that can be seen when you go walking around. I am worried though about the trees being damaged. I worry about the destruction of the trees, because there aren't many trees in the world, and we need the trees to survive.' I am reminded always in this research not to get carried away with the 'romanticism of nature'. Jonathan, aged nine, reveals through his photographs and stories the difficulties of living on the edge of the mountainside. He starts his story, 'When school finishes at 12, midday, we only going from 9 until 12, and we walk home.' He then shows me a photograph of a house 'hanging' precariously on the valley ravine. He has taken this photograph on his walk home. 'Many houses are hanging dangerously,' he tells me: 'One of them

is collapsing.' He points to a house in his photograph where I can see a length of plastic flapping in the wind: 'The one with the nylon hanging out front, that is mine. There is lots of rubbish below my house, piles of dirt and lots of dust. The trees use to be there but now they are cut down. When the water comes down here, it washes away more of the valley, one day our house will be gone.'

I move around talking to more children about their dream drawings. Bryan shows me his drawing of a green city and describes it for me this way: 'I dream of a green city with lots of grass with big houses in good condition and with parks and slides everywhere. With a blue sky and full of flowers.' Raul then pipes up behind me, 'I would also like that this whole place was green with grass. The sports field. Real grass would be better.' When we asked Salavdor 'What do you dream of?' he drew and wrote: 'La Paz Verde' (A green La Paz). While Alan is very specific: 'I would like all types of flowers growing around my home, roses, sunflowers and fruit trees and I would like a park. There is no park near my house in Alto Tacagua. Now everything is dry, the sports field is ruined; it has no grass, no trees, no roses nor daisies.' Dilan also dreams of a place with flowers and grass: 'I would like to live in a place where there are flowers and grass, where there is freedom, and my parents let me play with my friends.' I ask Ricardo, who has been sitting by watching this discussion, 'What do you dream of?' 'I would like there to be more green spaces,' he tells me. Diego then walks up to me and shares his dream drawing that has a park and many natural features. He tells me: 'I would like more green landscape with grass and many more parks.' The children of La Paz were also concerned about the quality of the natural environment and the implications of urban development and increases in populations that have caused pollution and contamination of the river and the forested areas. Jonathan, aged nine, provides a very typical response when he tells me in his dream place that he wants a cleaner environment, and actually wants the river back that has now been diverted due to the development: 'I want my river to be back and longer and that there were ducks and trout to eat and that it was cleaner.'

Global Imaginings in La Paz

'In my dream place there is the hill, my house, my cat, Pica my dog, Peque, me, dad, mum, Yesi,' Cesar from La Paz explains, showing me his drawing: 'I like it here in this imagined place because it has a safe and

healthy environment.' The city as a village, a community, an ecological collective of humans and animals, 'plants all entwined with Mother Earth, in the rituals and beliefs the earth is a living and nurturing being' states Adda also from La Paz. 'I don't like the rubbish because it hurts the animals, and there are plastic bags,' says Juan when we discuss his drawing of the neighbourhood. 'We need a world without rubbish'. 'I want my river to be back and longer and that there were ducks and trout to eat and that it was cleaner,' pipes in Jonathon. Later at another community centre in La Paz, Luz states, 'They burn things at the river edge. They burn clothes, rubbish and other things that contaminate the environment.' In his drawing of the neighbourhood, Luis identified the things he would like changed in order to make it a better place for him and other children. Explaining his drawing, he states: 'I drew what I don't like. A person dumping rubbish in any place and making the streets dirty, I drew a car that is emitting a lot of smoke and polluting our city. I also drew a boy destroying a tree and I don't like that.' Rodrigo went one step further and designed his own future Rodrigo city: 'In my future city,' he tells me, 'it would be clean, safe and happy. That would be Rodrigo's city.'

Jose, aged eight, from La Paz exclaims, 'In my dream place I would like to have a tree near my house and the climate I like is warm and I would like to have more animals.' Bryan, who was also eight years, shows me his drawing of a green city and describes it to me this way: 'I dream of a green city with lots of grass with big houses in good condition and with parks and slides everywhere. With a blue sky and full of flowers.' Raul also wanted green grass: 'I would also like that this whole place was green with grass. The sports field. Real grass would be better than this plastic stuff. Isn't that bad for the planet?' he asks. While Alan is very specific about what he wants: 'I would like all types of flowers growing around my home, roses, sunflowers and fruit trees and I would like a park. There is no park near my house in Alto Tacagua. Now everything is dry, the sports field is ruined; it has no grass, no trees, no roses nor daisies.' Dilan also dreams of a place with flowers and grass: 'I would like to live in a place where there are flowers and grass, I don't mind taking care of them,' he tells me, 'I want it to be a place where there is freedom, and my parents let me play with my friends.' Diego, aged 12 from Cotahuma, tells us, 'I want more sports fields and parks and places to play,' and second Diego, aged ten, from Taca Gua, says, 'I would like more sports fields with real grass, and a cable railway. I would like more green landscape with grass and many more parks.' Juan also dreams of sports fields: 'It is my dream place because

there is no sports field like this in my area but you shouldn't have to pay, it should be free. There should also be a park because there are parks but they are all destroyed and ruined.' When I ask Salvador, 'What do you dream of for the future?' he wrote in bold letters: 'LA PAZ VERDE' – A green La Paz. There is a whole new discussion I could engage in here around an ethics of care and how to foster an ethics of care in a posthuman world (Duhn 2012), care without finding ourselves caught up in the same (ironic) anthropocentric model of mastery that brought us to this place.

Entanglements of Pachamama

Children in La Paz are deeply entangled in a relation with their natural world. This is not just a worldly present relation but a deeply entrenched history of reverence and respect for nature and the earth that has evolved through their indigenous spiritual beliefs of the Pachamama (*Pachma* meaning 'cosmos' and *mama* meaning 'mother'). In the indigenous philosophy of the Andean people, the Pachamama is a goddess. She is Mother Earth. She sustains life on earth. Water, Earth, Sun, and Moon are Mother Earth's four Quechuan cosmological entities. When I was staying in La Paz, the local newspaper had a quote from the foreign minister about the new law on the rights of Mother Nature. I asked my colleague to translate.

> Our grandparents taught us that we belong to a big family of plants and animals. We believe that everything in the planet forms part of a big family. We indigenous people can contribute to solving the energy, climate, food and financial crises with our values.

Bolivia has passed the world's first law to grant 11 new rights for nature. Mother Earth is described in the law as 'a dynamic living system comprising an indivisible community of all living systems and living organisms, interrelated, interdependent and complementary, which share a common destiny' (Bolivian Legislative Assembly 2011, p. 2). The Law of the rights of Mother Earth includes the right to life and to exist; the right to continue vital cycles and processes free from human alteration; the right to pure water and clean air; the right to balance; the right not to be polluted and the right to not have cellular structure modified or genetically altered. Controversially, it will also enshrine the right of nature to not be affected by mega-infrastructure and development projects that affect the balance of ecosystems and the local inhabitant communities (Bolivian Legislative Assembly 2011).

Bolivia will struggle, like many countries, to cope with rising temperatures, melting glaciers and more extreme weather events, including more frequent floods, droughts, frosts and mudslides, that are often outside of their control. The steady rising of temperatures we are experiencing now (which has no borders) and which continues to accelerate could turn much of Bolivia into a desert. Glaciers in Bolivia below 5000 m, for example, are expected to disappear by 2030, leaving Bolivia with a much smaller ice cap. Scientists say that this will lead to a crisis in farming and water shortages in cities such as La Paz and El Alto. Many cities in Kazakhstan have also experienced the desertification of landscapes.

(Un)natured Nomadic Lives in Kazakhstan

> The yurt smelled of horse. Not in a way I was familiar with–like the nutty odor of a wet saddle pad, which makes me pine for a mountain trail. This *eau de equino* was the smell of cooked horse meat. And it wafted from a platter being passed in my direction. (Ryan Bell, National Geographic, December 17, 2015).

Kazakhstan is believed to be the birthplace of the first apple, it is the country from which the first human was sent into space, and there is evidence now that it is the land where humans first tamed wild horses.

Children in Kazakhstan told me that they wanted a clean environment with less garbage and dirt and more trees and flowers in their apartment courtyards. Children wanted more parks and green spaces close to where they live so they can visit them regularly not just in the centre of the city. Having a clean and accessible urban environment they had said was essential to their health and well-being, especially for those children living in high-rise apartments, as many do in Kazakh cities. The outdoor spaces close to the buildings where children live act as central spaces for play and social engagement. When children were interviewed in Kazakhstan about their cities, nearly half of them said that they did not live in a clean environment, including no fresh air, and not being free of garbage or dirty water. Air pollution, garbage and dirty, smelly water in communities in Kazakhstan are fundamentally the result of industrial smoke, mineral extraction, inadequate industrial and local government environmental policies and management.

Kazakhstan's native wildlife throughout the country, like its forest and other plant species are also in danger of extinction due to the overall levels of pollution and impacts climate change. Past estimates revealed that in

some areas it was believed that there will be no way of sustaining any wildlife after the year 2015. Historically, Kazakhstan was thought to be the site of the first domestication of horses by humans. It is a tragedy that due to deforestation, pollution and other demands on the land, the Mongolian wild horse has recently become extinct in the wild, along with many species of birds, mammals (including snow leopard and tiger), freshwater fish and plants being listed as threatened species.

Kazakhstan's natural environment has been impacted by a number of changes as a result of both anthropogenic exploitation and natural disturbances. Natural disasters such as floods, droughts, wind storms, epidemics and earthquakes have been consequential to natural degradation in Kazakhstan. Also when Kazakhstan was under Soviet Union prior to the early 1990s, a number of nuclear testing programmes were conducted. Several areas were exposed to high levels of nuclear radiation which led to radioactive pollution for a long period of time. Semipalatinsk was one of those locations. The Semipalatinsk Nuclear Testing Polygon (SNIP) was established in 1947. The nuclear testing was in its peak between 1949 and 1989, totalling 470 overland and air blasts with a number of underground explosions. These tests resulted in the formation of a number of small and large atomic lakes through which radioactive gas emissions spread into land and air, with a significant effect on agricultural activities, ecosystems, rivers, landscape and socio-economic conditions. The impact of these radioactive activities for the children in the city of Semey is written about in detail in Chap. 8. The country also hosts 30 uranium mines, which contribute to this ongoing pollution. Pollution from industrial and agricultural sources has also damaged and contaminated many rivers, with a recent UN report stating that some industrial metals in river systems are 160 to 800 times beyond acceptable levels (Malone 2013). Water supplies have also often been compromised due to the impact of human activities on the environment. Beyond the nuclear issue, the other single most significant natural environment issue in Kazakhstan is the Aral Sea.

The Aral Sea represents one of the world's most major and largest human-induced environmental problems. The Aral Sea is the site of the most visible damage to a water system in the world due in most part to greedy irrigation. Over the years due to this poor environmental management, the Aral Sea has lost over 60 per cent of its volume. The water level has dropped approximately 23 metres since its primary sources of water have been diverted (Zavialov 2005). Contamination and high salinity have meant that the Aral Sea no longer provides a habitat conducive to support

fish. The receding shoreline is dramatically evident with the former port of Aral'sk now more than 70 kilometres from the water's edge. Forced cultivation of cotton during the Socialist era of Soviet reign caused major water diversion for irrigation from the Aral Sea and many of its feeder rivers. The decrease in water has the flow-on effect of a steady increase of the salinity levels within the Aral Sea. According to Zavialov (2005) as the sea separated into different parts, the difference in salinity between the eastern basin and the western basin also started growing, with higher salinization in the smaller eastern basin. The shrinking of the Aral Sea has been called one of the planet's worst environmental disasters for plants and animals. With high salt levels, the natural fish stocks also died off. In a bid to keep a dwindling commercial fishing industry from disappearing, new species were introduced, which led to the demise of all local fish species. Eventually, the high concentration of salt killed off even the introduced species. The region's once-prosperous fishing industry has been essentially destroyed, bringing unemployment and economic hardship. The Aral Sea region is also heavily polluted, with consequent serious public health problems. The departure of the sea has reportedly also caused local climate change, with summers becoming hotter and drier, and winters colder and longer. It would seem unlikely that an inland sea in Kazakhstan could affect something as vast as earth's climate. Yet the truth is that the shrinking sea and salty dust storms have already changed the climate in the region to the point of an unlikely return to its original climate. With the shrinking sea, there is not enough surface area to disrupt frigid north winds. Nor does the sea contribute the moisture it once did to the snowfall in mountains of neighbouring and more distant regions. In addition to the steadily increasing temperature, the dust and salt storms are coating the mountain glaciers nearby and causing a decrease in the overall volume of ice. The degree of melting is over 12 times the rate of the pre-cotton-growing era, and as there is less moisture in the air to replace the dissipating snow, the glaciers continue to diminish. As the glaciers continue to melt, the weather will become more unstable and the social and ecological fabric of the country will unravel with the constant wind which spreads the salt and chemically polluted dust from the marine basin to its neighbouring countries.

Dry Riverbeds

I have just arrived in the city of Kzyzlorda after a long flight. I am sitting at a table with my hosts, a large group of local and notable politicians, singers, dancers, business people and local community. There is dancing,

singing, speeches and vodka. This was to be my first encounter with Kazakhstan's popular dish of *beshbramak*. Made from boiled horse meat, it has a strong meaty smell. It comes to the table in front of me served on a large platter and on a bed of noodles. The consumption of horse meat is common in Central Asian societies, due to the abundance of steppes suitable for raising horses and the nomadic life which depended on a horse–human relationship. Horse meat is the main festive meat of Kazakhstan. It is brought to me first, as the guest. I look at this plate of meat with a sense of foreboding. I am a vegetarian. Even if I wasn't a vegetarian I am not sure I could stomach it. I am told that the eating of horse is out of respect for the horse. One horse could feed an entire family as they made their journey across the steppes, packing up the yurt, rebuilding. At the start of winter, Kazakh families harvest a fattened two-year-old horse to supply them with meat for the rest of the season. These connections between human and horse are centuries old. The Kazakhs' forebears rode across the steppes with Genghis Khan in the thirteenth century, an army moving with alarming speed, thanks to its horses. Those horses provided milk, blood and eventually meat to feed the army. I smile and ask to be excused from eating the horse meat.

Kyzylorda is a city in the western region of Kazakhstan on the steppes with a cold desert climate of hot summers and cold winters. When I visited there in 2014 to do our research with children in the city, it had a population of around 188,000 people. In modern times, it has been known for its oil and gas fields and production of rice, while historically it was one of the centres of the Silk Road. The city is on the Syr Darya River, which is one of the rivers that used to flow into the Aral Sea, before it was diverted to irrigate the desert, therefore contributing to the drying up of the Aral Sea over time. Kyzylorda is situated specifically in the Aral Sea Basin. Before the drying of the sea, there were a good number of fishing cooperatives and shipyards, but due to the retreating of Aral sea, thousands of people became unemployed, with many migrating to other places. Around 15 per cent of arable land in the area has become desert due to lack of water annually, with a quarter of the pastures lost in the southern part of the Aral Sea. This area deals with serious water-supply-related problems and has consequentially become one of the most poverty-stricken provinces of the country. The lack of fresh water has also had major impact on the capacity of the natural environment to maintain plant life in the region and in Kyzylorda city. Other major issues which affect the local environment around the city are air pollution, decreasing levels of underground water, dust storms and salinity. The effect of earth's changing climatic

conditions has been the rising temperature, which on average is accelerating at twice the global rate (Valantin 2016). Many of the older children voiced their concerns around the issues of the Aral Sea drying up.

Kulanbekova tells me that her dream was to imagine a city where the Aral Sea would be restored and become an important tourist attraction. She told me she wished the Aral Sea was not drying out and that there were lots of fish. Many children like Kulanbekova from the Kyzylorda were concerned about the lack of greenery, especially in the outer areas of the town. Because of the consequences of the environmental degradation, the city is now in a dry desert region where it is very difficult for plants to grow. Many children told me that even though their families and others in their apartment block had planted trees, it took a lot of manual watering to try and keep the plants alive, and often the plants didn't survive. Many children wanted the opportunity to go to places outside town close to where the river was still flowing so they could go fishing, swim and enjoy fresh air. Kanat, who was one of our young participants, was only nine years old. She summed up many of the main sentiments from the young children in her interview. She tells me, 'I want my house to be improved. I wish there were playgrounds near my house. Also I want there to be a playground for disabled children. I wish to have an elevator in my house. I wish trees to be planted around the house. Finally, I want to have hot water in my apartment.'

Many children in Kyzylorda were interested to be active in improving their city and villages. Arthur told me he lived in the village Belkui. In his interview, he said, 'I wish I could participate in construction planning near my house: a playground for children, football and basketball court, and a youth club which is necessary for youth to spend time during the day and in the evening. Our village needs a park, a fountain and an ice palace. I hope that my dream comes true.'

The key changes children wanted to make to their neighbourhood and their city were to make it more child friendly. Children in Kyzylorda in particular had the most concerns about the quality of the physical environment. The issue of air quality was quite specific to certain neighbourhoods in cities, often as you would imagine correlating with industries or other forms of emissions of contaminants.

Yersultan, Asel and Asylkhan

Yersultan, Asel and Asylkhan were the three youngest children interviewed in Kzyzlorda. They were all girls and all nine years old. When I arrived at the school, they had their neighbourhood drawings to show me and each of them explained their drawing (Fig. 4.9).

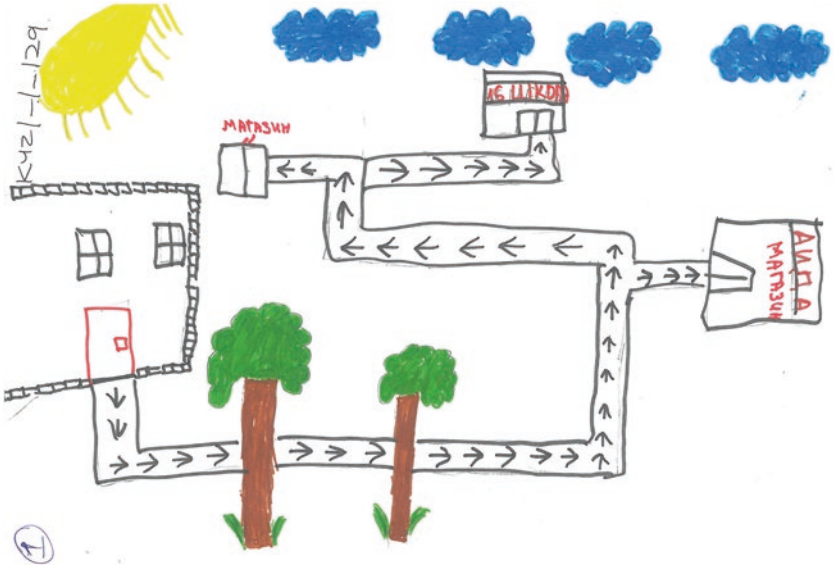

Fig. 4.9 Neighbourhood drawing by Yersultan, Kyzylorda

Yersultan tells me that she is nine years old, she has lived in Kzyzlorda all her life. She tells me that her house is pretty because there are trees near her house. 'I really like my house,' she says, 'because here I have a grocery store. My house is big and there live seven people here. These seven people are my grandfather, grandmother, father, mother, uncle, aunt and me. I love my family very much' (Fig. 4.10).

Asel describes her drawing by identifying the value and importance of 'nature' nearby, the role trees play in cleaning the air and the beauty they bring to her life, 'I drew my house because of the beauty and nature near the house. The air near my house is fresh. Trees nature's beauty and air's freshness protect. People throw used items in rubbish bins' (Fig. 4.11).

Asylkhan told the story of living in a small house in the city, unlike many of the children who were in apartment blocks. 'I live in a cottage. There is a courtyard near my house. There also grow trees and blossom flowers. There are also a railway station and shops where you can buy bread and flour. On weekends, I usually go to a mall with my family and friends. The mall is not far from my house. My courtyard is bright.'

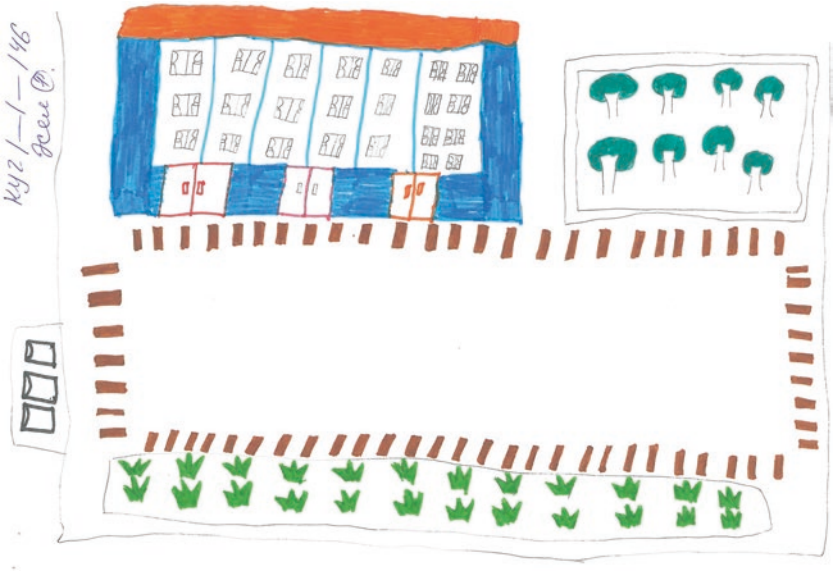

Fig. 4.10 Neighbourhood drawing by Asel, age 9, from Kyzylorda

Fig. 4.11 Neighbourhood drawing by Asylkhan, aged 9, male, Kyzylorda

Fig. 4.12 Neighbourhood drawing by Kulanbekova, aged 15, Kyzylorda

Kulanbekova and Shamil

The next group of discussions were with two of the older girls, Kulanbekova and Shamil. They spoke of how much they valued the natural environment and why they wanted to be able to go outside in a place where they could access trees and have fresh air (Fig. 4.12).

Kulanbekova tells me, 'I want our city to have clean and green trees. I dream that we have skyscrapers in the city. I want to have a lot of trees, greenery, and flowers not only in the city centre, but also on the outskirts. I wish there are also buildings with different architecture design and that irrigation ditches in the city were full of water, to water greenery. The city should have places where guests from other cities and countries could go. I wish there were also a lot of sightseeing places around residential buildings. I wish tourism around the Aral Sea was developed so tourists from different countries, republics and cities could come. I wish the Aral Sea is not drying out and has lots of fish.'

Shamil is 16 years old. She provided a very typical response for children in the regional cities where the landscape is quite challenging. In his dream drawing, he drew the mountains, lots of trees, fresh rivers and animals.

Fig. 4.13 Dream drawing by Shamil, aged 16, from Kyzylorda

Many children used this idealized image of mountains and trees to represent the importance of clean air and an unpolluted environment. Many said it was the city of Almaty and they would like to live there. 'I live a good life, and I am happy with the courtyard. It has a sports court, a children's playground. In the evening, one can sit by the water canal and breathe fresh air. I wish there was less cars there. I wish the ground was covered with green pastures. I wish the canal was crystal clear and they would clean it more often.' Describing her drawing, she tells me, 'I love mountains because there is no mountains in our city. I love nature and animals. I would like to walk in the mountains, which would be interesting. I want to take pictures of animals. I would want to explore the underwater world. And I would want to dance because of being happy' (Fig. 4.13).

'I dream and wish,' says Shamil, 'that my birthplace, Kyzylorda city, was better. It will be good if skyscrapers and beautiful buildings are built in Kyzylorda. I wish there were more flowers and trees in the city. I will make my own contribution for the development of our city and improvement of citizens' health.'

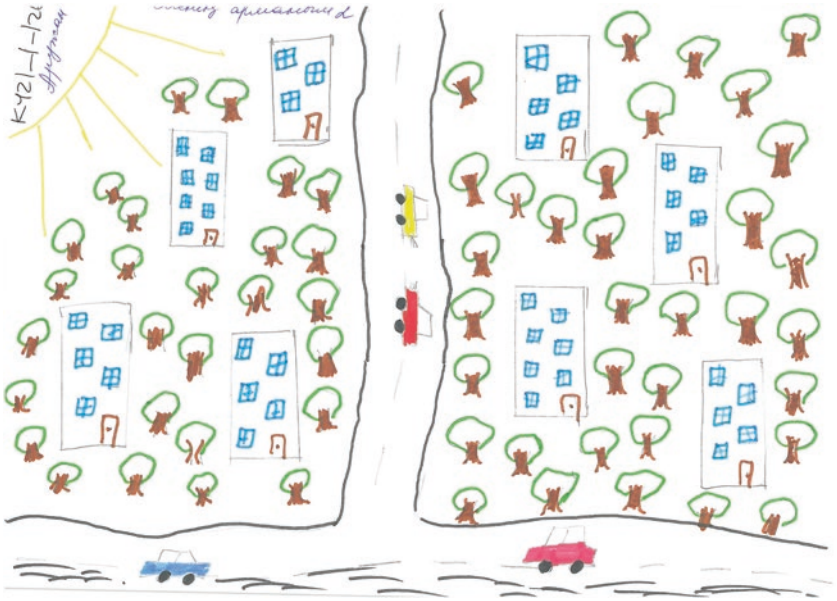

Fig. 4.14 Dream drawing by Aruzhan, aged 9, Kyzylorda

Aruzhan and Aidana

Aruzhan says she also wants a clean place where, instead of pollutants from factories, she is able to be in the water, earth and plants, breathing fresh air and the area would be clean. 'My cherished dream,' says Aruzhan, 'is to live out in the nature where there is clean air and everything is clean, where horses and other animals run around. I personally like live nature and wish we had a creek near my home. I want a place where it is peaceful and there are no polluting plants and factories.' Her dream drawing has extraordinary detail of rows and rows of trees and a forest delicately drawn from her shared imagination of a world, very unlike the dry, deserted landscape of her home (Fig. 4.14).

The last girl to come and share with me her imaginary dream place is Aidana, who is also nine. 'I have many dreams,' she says as she sits down beside me. 'I want Kazakhstan to be better. I wish the air was clean and a lot of trees grew. I want to live in Almaty. There are many mountains, I like mountains. Almaty is considered the greenest city of Kazakhstan. There are many flowers and places for relaxing with nature in that city, but not in ours' (Fig. 4.15).

Fig. 4.15 Dream drawing by Aidana, aged 9, Kyzylorda

I leave Kzyzlorda and travel by road to Aktau. Aktau is the one of the smallest cities in my study of Kazakhstan. It is located in the western region of Kazakhstan like Kyzylorda, but is on the Caspian Sea. The Caspian Sea is a geographically and historically unique area in the west of Kazakhstan. While it might be questionable to refer to this area as a sea for me, someone who has always lived on the coast of an ocean, it is more like

a landlocked large salt lake. It holds a special and romantic place in the heart of the Kazakh people as Aktau is the only city in Kazakhstan that resides on a body of open water. It is the only place in Kazakhstan where you can play in the sand, build sand castles, watch ships on the horizon and see the sun slip behind a watery horizon. The city itself is quite young, set up predominantly to support uranium prospectors and oil workers in the 1960s. The apartment blocks are typical soviet style of that era, large blocks with small windows and yard areas that are mainly full of parked cars. With the city having very few planned or landscaped parks and play spaces, these yards are important places for children to play. Overwhelmingly, the children spoke of the sea front as the main feature of the town. A boulevard sweeps the coastline throughout the city and contains a significant paved area with lights, playground equipment, seats and small café's scattered along it, which the children included in their drawings and discussions. While the apartment blocks themselves are quite run down and courtyards are often just dirt and dust, the young children particularly spoke mostly positively of their local environment. Many of the young children said they loved where they lived and were happy.

Amir, aged eight, told me, 'When I get back from school I help my mom. My mom sends me to the shop when there is no bread at home. I live a very joyful life. When I finish doing homework I go outside to play with my friends. I love my life.' Many children said they especially loved living close to the seafront. Bibizhan, aged 14, tells me, 'The seafront which was built recently, there are a lot of playgrounds there. Not only young people walk there, but also children with their parents. One can rent a bike and ride it there. In summer you can swim, the water is clean there.' And Bakhytzhan, aged eight years, shows me his neighbourhood drawing. 'I drew my house. I drew it big and a tree near it. Because trees help to clean air, also apples grow on them.'

When I listen to children's stories, they tell me about their family villages where their grandparents are still living and where they go visit. These villages were important because it is here where children said there were lots of grass and cattle. The main concerns children had though were consistent with living in a smaller regional city that was not close to one of the large modern cities like Astana or Almaty. Children were concerned that they did not have educational opportunities. They spoke a lot about going to university and having a better education. For the older teenagers, their concerns were the lack of things to do, being bored and not having

many youth spaces within the city. Having interesting places to enjoy, more greenery, parks and play spaces, amusement parks and shopping malls were all on the list of improvements. One child even mentioned that they wanted the chance to see concerts by famous musicians and another was concerned about young people and drug addiction. There were overall concerns about the quality of the environment due to the dirt, dust and water quality (the water is all desalinated water) and a couple of the older teenagers noted their concerns about the possibility of nuclear radiation from the old nuclear reactor that was on the outskirts of town.

When listening to children in the interviews and during our walks around the city streets, children told of the things they wanted in order to improve their city to make it more child friendly and responsive to their needs. One of the biggest concerns children had was about the helplessness of animals that were on the streets and said they wanted a nursery for animals built in the city. Some of the children said they would be willing to work in the nursery and hoped that care for animals that might be injured or hurt would also be available. Because the city is on the steppe, there is not much vegetation, so children wanted more parks with more greenery so there were places to walk and to breathe fresh air. They also wanted more variety of places to visit, and places they could engage with nature. They informed us that the land was polluted and the sea foreshore, although a beautiful place to walk along, was dirty and was crowded with large ships with shipping containers. Children also told me they wanted the streets and buildings around the city to be cleaned up, and for the council to get rid of the trash and clean the buildings with drawings and swear words on them.

What children from Aktau spoke of was similar to children from the other cities around the region of Bakhytzhan. They told us about the importance of trees in the neighbourhood to help keep the air clean. Broadly speaking, most children in Aktau felt they had enough safe drinking water at home, but there was an issue around the air quality. In specific neighbourhoods, things were worse than others, often correlating with industries or other elements in the environment that were causing concerns about emissions from contaminants. The older children especially were acutely aware of the issues of pollutants on their own health and the health of the environment. They told me unclear air was periodic, that it changed according to different local factors possibly connected to things such as the day in the week when garbage gets collected or if it is missed altogether. The changing weather caused changes in things such as stagnant water

lying around, the wind whipping up dirt or oil being washed into the drain systems from cars. Many children told us that it made a real difference where you lived as these issues impact you personally.

Alena and Mziya

'Our city is a rubbish dump! Because of the radiation there is no clean air, nothing to breathe, plants don't survive. Wherever you go, everywhere are spits, trash, buildings with drawings, swear words.' Alena draws for me a picture of the nuclear power station that was built on the edge of town and which she believed was causing lots of pollution in the city. Her dream drawing was of a very different place. Out on the steppe, she described her drawing: 'I want to live in Zheleznovodsk. There the air is clean, everywhere is green, a lot of sightseeing places, clean, a lot of parks and different animals' (Fig. 4.16).

Mziya is also 15 years old. Sitting next to Alena, she shares with me her neighbourhood drawing (Fig. 4.17).

Mziya tells me about her drawing, which includes the Caspian Sea. Mziya writes next to her drawing, 'I drew a sea because I have good memories associated with sea. I like the sea and to spend time by the sea. I also drew a small house in the fall. I was born in the fall, that is why I like fall. I also like to walk in the rain. I like to listen to the sound of rain. After rain there is clean air, I like to watch a rainbow.' Many children in Aktau spoke about the beauty of the sea and the boulevard that has been built along its foreshore to allow the community to enjoy its beauty, even though it was a busy congested shipping route.

Gulnaz, Yana and Diana

Aktau is known for its unique block address system which was because it was originally planned as a camp for the workers of the oil industry. Almost all streets inside the city have no names, and addresses in Aktau generally consist of three numbers: the district number, the building number and the apartment number. The drawing by Gulnaz is an illustration of the apartment blocks, which in the city were often grey and dirty. Gulnaz, in her imaginary place, has taken her neighbourhood and re-natured it: 'It's my house in the apartment block in the picture. But in my imagination it now has houses, tree and flowers are in this picture as well. We have planted flowers together me with my friends. I like my courtyard now' (Fig. 4.18).

Fig. 4.16 Neighbourhood drawing by Alena, aged 15, Aktau

For many children, their imagined place was far away from their real life in the block apartment of Aktau. Yana, Diana and Gukhar, all created dreams of living in the village in the future. The village represents a place where there is clean air, fresh fruit and vegetables and animals. It is out on the steppe, the ancient lands, the home of the nomad, the wilderness, horses, wide open spaces, a yurt. When Yana showed me her dream drawing, I felt like I was being transported to an ancient place. When I sat beside her to let her share with me her drawing, she was furiously finishing

Fig. 4.17 Neighbourhood drawing by Mziya, aged 15, female, Aktau

the detail of drawing: 'Fresh, clean, mountain air, horses, blue sky, mountains, steppes: that, that is my DREAM place!' she said, 'not like my city where I live now which has a rubbish dump! No sightseeing places. Dusty air. Two different groups of society. A lot of incidents. Lack of educational and entertainment places. Bad people.' Gaukhar told me she wanted to live in a village in the future. 'My grandparents bought a piece of land in the village called Akshoukyr. So we are going to build a house there. The air in the village is very clean, and we are going to plant trees, fruits and vegetables. And all I want is to have a puppy' (Fig. 4.19).

Diana, like Gaukhar, tells me she would also like to return to a simple nomadic life. Her drawing includes a yurt in a wild and abundant steppe: 'I would like to live on the steppe because I can have a cat and a dog there. I want to be with animals and nature. Also, the air there is clean, and there are big and beautiful mountains. And I like to walk in the fields.'

Children wanted shelters or refuges for homeless people and young people who were in need of support, whether due to drug addiction or having problems at home. Many said there was a need to build educational

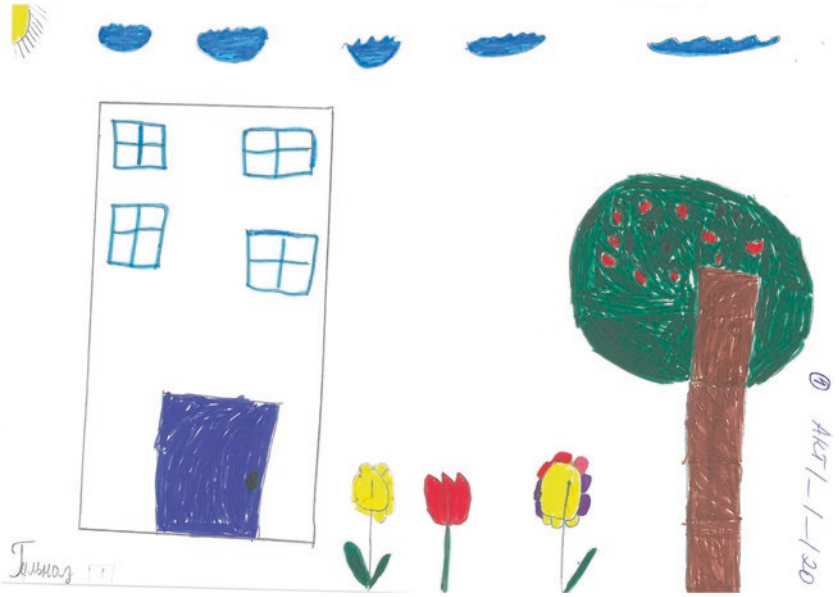

Fig. 4.18 Dream drawing by Gulnaz, aged 8, female, Aktau

Fig. 4.19 Dream drawing by Diana, female, aged 8, Aktau

and entertainment places for children, especially teenagers who were bored and had nothing to do, which often led to incidents. The vase open spaces and polluted waters mean there is very little safe places for children to play. Children spoke of the lack of discussions with children about how to live a different life than the past. As well as not feeling like they were listened to, many children said they felt isolated and identified that they did not have adults outside their families in their community who would be able to help them if they needed support. Being a city which was close to a large, very old defunct nuclear power station, they also told me they were worried they were not properly prepared with the information they needed to be able to respond to and be safe in the situation of major disaster or an emergency in their community. 'What if something happens? It will kill us all, the sea, the fish, the plants, it will all die.'

My UNICEF colleague and I head back to the hotel after a long day working in the field. I am dreaming of a hot bath, and he is on search for kumis. Kumis, he tells me, is a fermented mare's milk, traditionally made. Traditionally, this fermentation took place in horse-hide containers, which might be left on the top of a yurt and turned over on occasion, or strapped to a saddle and joggled around over the course of a day's riding. He is looking in the local shops that are contained in trailers on the marginal lands in between the large apartment blocks. Kumis is a dairy product similar to kefir, but is produced from a liquid starter culture, in contrast to the solid kefir 'grains'. Because mare's milk contains more sugars than cow's or goat's milk, when fermented, kumis has a higher, though still mild, alcohol content compared to kefir. My colleague tells me he finds it hard to sleep without his kumis, partly he says because of the comfort of it being a nightly ritual. From when he was a young baby, his mother would provide him with warm kumis before going to sleep. Kumis itself has a very low level of alcohol and has been touted for its health benefits, often being drunk in order to avoid the consumption of potentially contaminated water. It is also part of the reciprocal relation of earth–horse–human, a residue from nomadic life. I head up to my room and turn on the water for the bath; a dark brown sludge fills the bath tub. I wonder if it is rust in the line, and I empty the bath and start again. It fills again with brown sludge. I take a photograph with my phone and head down to the reception. I meet my colleague in the hotel foyer. He has a number of bottles of kumis in his arms. I head up to the reception and show them the picture on my phone. They laugh and say something in Russian. I look

Fig. 4.20 Bathwater in Aktau (Source: photograph by author)

back at my colleague who is standing behind me. 'The water is always like that in Aktau; it doesn't go away.' I must have looked surprised. 'It shouldn't cause you any harm, something to do with the desalination plant not working very well, the dirt and dust from the desert and the nuclear power plant that doesn't work anymore and now the plant that supplies the electricity to clean the water isn't very effective' (Fig. 4.20).

I load the image on my social media site with the caption 'to bathe or not to bathe', and I get a quick response from a friend, who says maybe I should buy some bottled water or swim in the sea across the road. When speaking to the community in Aktau, they told me they were very worried about the issues of the power supply and desalination of water, they were mostly concerned about the effects of dismantling the old nuclear reactor to replace it. 'Look what happened in Japan', one had said to me. 'You can

never make them safe and the environment here is already polluted, this would make it worse.'

Since I had been in Kazakhstan, I read the government had decided to abandon nuclear power. Instead, it is seeking to choose low-impact sustainable green power options:

> Mangistau Oblast in Kazakhstan's west was chosen as the plant's location because of high level of solar activity there. In addition, such plants are usually located in remote areas or islands where it is not feasible to construct long power transmission lines, gas and water pipelines. Empereal company successfully implemented similar projects in nine countries of the world. It hopes that this project will help Kazakhstan achieve its goal of generating at least 30% of its electricity from renewable energy sources by 2020 (Satubaldina 2015).

A community member was quoted as saying in the local newspaper Kazpravda:

> Our region consistently counts the number of sunny days; therefore we can produce electricity using solar panels. And the wind brings benefit to our people, because with its help we can generate electricity. In addition, it's the environment, clean environment, it is our health, the health of our children (Kazpravda, 15 December 2015).

Kazakh Imaginings

Children's imaginary images illustrate their yearning to be in a clean and natured place. Children stories of growing up in two regional cities on the steppes in the southwest of Kazakhstan reveal stories of concern and fear. The ongoing retreat of the Aral Sea, the contamination of the air and earth due to the high winds and changing weather conditions, all contribute to the child's desire to dream of green and natured place, a place where they can be with animals, grow food and flowers, have access to clean water and fresh air, living a traditional village life far away from the harsh desert sun and denuded city streets sprawling with Russian apartment blocks. Theirs is not an ancient alliance with a goddess of Mother Earth like the Bolivian children, but a reverence to a history of an entangled relationship, intermingled as life on the Steppe gave rise to the largest nomadic tribes the world has ever seen. Kin groups are central to Kazakh life. Who you are, who your family is and where you are from are very

important. Dating back hundreds of years to the times when the Kazakhs were divided into three distinct hordes or large tribes, it has been important to know about your kin groups. The nomadic life was a religion. The very existence of the tribe was dependent on the weather, knowing and being in relation to the land. The nomad lived in harmony with their surroundings, being one with all things. This complicated relationship to the past is still relevant today for many children in Kazakhstan, who, after an extended history of Russian regimes, will be the first generation to determine their own distinct place in this new world of the Anthropocene.

Conclusions: Grappling with the De-centring of the Human

Alternative to a romanticized child–nature relationship, a classic reinvention in many ways of Rousseau's 'education of Nature' (Taylor 2013), these stories of children in relation with nature and the complexities of an entangled life with their environment in Bolivia and Kazakhstan help to redefine one's sense of attachment and connection to a shared world to enhance an alternative way for knowing and enlivening 'multiple ecologies of belonging'. Considering the strong alliance of the Pachamama and the treaty for the rights of Mother Earth and their influence on the conceptions of nature relations by children in La Paz—theirs is an example of a worldview where the earth deserves and is provided with the same ethical and political considerations as humans. Without these perspectives, a westernized 'nature movement' only continues to idealize and romanticize the child–nature relation and does little to disrupt well-established dualisms: human and nature, nature and culture. In these diverse stories of children in the Anthropocene, the child body becomes more than a 'naturalized child'; they become a product of the assemblages, associations and relations through which they are connected to the more-than-human in diverse and complex means.

Children's encounters and relations with the environment influence their children's lives. They are central to their stories of living and being in their cities. The majority of children growing up in the slums of La Paz, although in a damaged landscape, were deeply embedded in the potential of intra-acting with the natural environment. This was not an imagined pure nature, a wooded forest with birds and butterflies; it is the difficult dirty gritty world of living in poverty with nature through shared material matter. For the boys especially, adventures into the hill top forests are an

important part of their play activities even though it can be dangerous and very dirty and dusty. Girls have less freedom and tend to be limited to engaging with the trees and gardens close to their homes. The encounters with Mount Illimani and their impact on their sense of connection to place are very unique and meaningful. An aesthetic openness to the wonder of mountain, the clouds, the weather drew them into a oneness, yet it wasn't a sense of wonder of nature as 'extraordinary', 'out there' was being one with the world, being nature as everyday. Children shared photographs from their viewing point, a place where they would go to be with the mountain, especially at sunset.

If you could imagine the world differently how would it be? Children in both Bolivia and Kazakhstan were posed this question and they expressed through drawings and stories their global imaginings for a future world. Each child had the chance to share their drawing with the group of children and adults and explain what it is that they wanted for their future, and how they could change their city or earth to be a better place for all. Many children had similar aspirations wherever they were located. Children said they wanted a home and community that was safe and where they and their kin companions felt loved and nurtured. They wanted a world that was not contaminated, polluted and choked up with rubbish. They wanted to care for plants, animals, air, earth and oceans. They wanted places to play and be with their friends, including the non-human kin they share their neighbourhoods with. They wanted to walk freely in the environment with others without fear of being hurt or abused, or the dangers of landslides, natural disasters or nuclear contamination.

By shifting away from the child in nature as the only agential body and focusing on the materiality of child bodies and the bodies of other non-human entities as relational assemblages allows a new ethical imagining for children and their encounters with place and nature. In this chapter, I have reframed the importance of children's childhood experiences as central to their role as collective agents with other beings in reconfiguring a potential beyond the current sustainable green cities of a neo-liberal white middle-class politics. Like the findings of Taylor and Pacini-Ketchabaw (2015), children's sharing of their ideas about nature is an acknowledgement that:

> learning through encounters with other species is not always harmonious and pleasant, is not always equal, and does not offer us "moral certitudes or simple escape routes" from the mess we are in (p. 20).

The potential to extend 'ecology' beyond a hierarchical anthropomorphic structure to 'uncover a whole world of resonances and resemblances' (Bennett 2010, p. 113). This opening up (beyond anthropomorphism) allows opportunities for the nature–culture divide to be reconsidered as 'ecological collective', containing active agents of human and non-human elements. For educators, it allows openings for posthuman pedagogies that consider relations between material objects to be reassigned as a 'vital (vibrant) kinship' between the human and non-human (Bennett 2010). Such an approach therefore may lay the foundations for a recasting of learning about sustainability. For others involved in city planning or childhood support services, it encourages them to be attentive to, notice and acknowledge rather than dismiss the means through which children are encountering nature in their everyday lives. I have argued in this chapter, noticing difference and complexity within child–nature relations by supporting a posthumanist approach to addressing the challenges of the Anthropocene, is central to supporting posthumanist ecological communities.

Without disregarding a history of research on children and nature, this chapter has sought to challenge anthropocentrism, anthropocentrism that reinforces the exceptionalism of humans (nature exists solely as a restorative 'resource' for unnatural disconnected children) in order to build and challenge past assumptions. I have sought to bring attention to the possibilities for considering something other than the greening of cities to support global agendas of sustainability. Instead I am insisting we acknowledge children's way of being and knowing the world that is outside of the modernists' divides of human–culture, subject–object and child–nature. This chapter sought to support new imaginings for the mattering of relations through the ploy of intra-action. It is about opening up possibilities to consider how to engage with the complexity of the child–nature encounters in order that children in cities 'learn with rather than learn about the non-human others we cohabit' (Taylor et al. 2013, p. 59). Put simply, posthumanist and new materialist readings of child–nature encounters, like those presented in this chapter, invite researchers and educators to look at data differently in order to support a shared imagining for a 'collective ecology' of human and non-human, child–nature–city collectives in the years of the Anthropocene.

This chapter is an exploration of what it means for children to be in relation with the natural world in their everyday lives. Children acknowledge that being in the world means having obligations to be responsive to it and to actively share agency with others who are also attached to it.

To recognize that humans are nature. That from birth the child is always innately connected with and in relation to the natural world. Even in cities that seem devoid of 'nature', it exists always in us, the soil, the air, the plants and the water that sustains us. We are always deeply in relation with 'nature' and it is deeply in relation with us.

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CHAPTER 5

Movement: Materiality of Mobilities

Flow, freedom and movement of human and non-human beings acting in the world are constituted as inter-subjective mobilities. Understanding the materiality of mobilities, how bodies flow through places and spaces with and through materials are, as Aldred (2014) notes, central and important to research on bodies in the landscape:

> How one moves during fieldwork has important consequences for the interpretative process, and presented movement as a conjunction between body and landscape … in order to study movement there is a need to understand it not dialectically, in-between static materials and moving bodies, but rather through the flows in which these two become co-constituent in movement. (Oscar Aldred 2014, p. 40)

Imagine, it is 2005, I arrive for the first time in Japan. I am making my way across the highly complex city streets of Tokyo to attend a meeting. It is mid-afternoon. As I walk along the footpath, I encounter a small group of kindergarten-age children walking along the street in front of me. School bags on their back reveal they are on their way home from school. They are oblivious to my presence as they busy themselves with the task of engaing with the materaility of the streets, crossing pathways, picking up autumn leaves, straddling low brick curbs and chatting among themselves. There is not a supervising parent in sight, no walking school bus conductor, no older siblings. As a parent myself, I feel a sense of foreboding—I worry about their safety. Eventually,

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I have to go on to my meeting and leave them. When I arrive at my destination, I recount my experience to my Japanese colleague and exclaim, 'There were no adults watching out for them,' He was a little taken back. 'What do you mean? No adults. There were the car drivers, the shopkeepers, the other pedestrians—the city is full of adults who are taking care of them!' Subsequent visits and research I have conducted in Japan with colleagues in the years since have revealed the ease through which Japanese children are able to move through city landscapes. In Australia, it is a very different story with less than half of children walking to school and even less moving around neighbourhoods. As a parent, this raises troubling questions around how this comes to be, that children's freedom to move around the city in one country can be so different to children in another. Research has revealed consistently that the capacity of children to enjoy the freedom to be immersed in the city, to move around, changes dramatically from one city to the next, from one neighbourhood to the next. But it is not only this performative quality of freedom that interests me, it is what is the expression of this freedom. How can we consider the changing demands of a precarious world as implicated in children's movement? Especially when the possibility for rekindling relations with the more-than-human world seems dependent on children's capacity to be in the world, to experience their entanglement, not just view it from a mediated distance (Fig. 5.1).

Elizabeth Grosz (2010) writes, 'Concepts of autonomy, agency and freedom – the central terms by which subjectivity has been understood in the twentieth century and beyond – have been central to the feminist politics' (p. 139). Grosz provides a thought-provoking analysis of freedom drawing on the work of Bergson, and although I am not going to use her analysis fully in this chapter, I am interested to draw on some of the key concepts that she addresses when I consider children's freedom in cities. For instance, how we can think of freedom and movement differently if its ontological roots aren't located in a pure determinist or phenomenological paradigm. That is, '(f)reedom is not a quality or property of the human subject … but can only characterize a process, an action, a movement that has no particular qualities' (Grosz 2010, p. 147). Freedom is not then about choice or options, the acquisition of objects—I am free to make a choice while others aren't (Grosz 2010). To be 'free' in this sense is a freedom of action, it is connected to 'embodied being, a being who acts in a world of other beings and objects' (2010, p. 147). Freedom is closely connected then to concepts around movement, the materiality of movement, to the reconfiguring of what comes to

Fig. 5.1 Children walking home from school streets of Tokyo, Japan (Photograph by author)

be viewed as autonomous acts of freedom. If therefore, 'freedom is located acts rather than subjects' then can freedom be constructed around the capacity to 'to harness and utilize matter for one's own purposes and interest' (2010, p. 148)? If being human then is to be and becoming 'a heterogeneous compound of wonder-fully vibrant, dangerously vibrant, matter' and 'if matter itself is lively, then not only is the difference between subjects and objects minimized, but the status of the shared materiality of all things is elevated' (Bennett 2010, p. 12).

At a community seminar in Sydney recently, I asked the audience of parents to imagine themselves as eight years old being free in a special place, and to describe that place to me. The majority recounted being outside in their neighbourhood with other children, out of earshot of parents: 'I had some bushes where I would play and hide with my brothers and sisters and sometimes friends' (Wilma, aged 43); 'My friends and I would go to this vacant lot and build our own cubbies' (Richard, aged 36);

'There was a playground at the end of our street and I would go there to play' (Catherine, aged 27); 'There was a creek near our house and we would go and search for tadpoles, I wouldn't go home till it was dark' (Mark, aged 31); 'We use to get all the neighbourhood kids together and go out on the street and play cricket' (Andrew, aged 39).

Tim Gill (2007), author and play commentator, would call this parenting style 'benign neglect' and for many growing up in baby boomer suburbia, this was the quintessential experience of childhood. Many parents said looking back now they wondered how their own parents came to let them roam and move so freely, but good or bad they said these experiences had shaped the adult they came to be. Self-reliant, independent, confident, physically active, competent, good risk assessors and connected to the more-than-human world, these are just some of the positive outcomes the parents told me came of being a child who had the freedom to move around without an adult. Next step in the seminar, I then asked the audience to consider if they would give these same freedoms to their own children. They all said no. 'I would love to let my kids play outside, but I just can't trust other people, there are just too many dangers these days. Actually, sometimes I think back and I can't believe my parents let me do the things we used to do' (Richard, aged 36); 'No way, too risky' (Sara, aged 38).

The most significant concern pervading many parents around the act of freedom for children within the 'ecological community' of their neighbourhoods is the fear of the 'other', mostly the likelihood of a child being abducted by a stranger (Malone 2007). For many parents, the only defence to children being at 'risk' 'out there' is eternal vigilance (Jensen et al. 2014). 'Anxious parents and their over-protected children are immersed in what has been termed a "culture of fear" … special places for children are largely inside spaces, where the adult gaze monitors potential dangers to provide a "risk-free" environment for the young child' (Duhn 2012, p. 20). The unfortunate irony is that in the majority of high-income nations, the biggest risk often comes from within the homes rather than outside of it and the number of child abductions has been going down for a decade. When I tell my audience the odds of a child being murdered by a stranger in Australia is one in four million and their child is at a much greater statistical risk of drowning in the bathtub, being hit by a car at a pedestrian crossing or taken by a shark, they answer typically like Andrew (parent, aged 39): 'I want to and I wish we could. I know the chances are slim but I just couldn't forgive myself'. Eternal vigilance in itself is also an

interesting concept in this discussion on freedom as it predisposes the responsibility of children autonomy directly on the parent. That is, freedom is an act of will provided by a parent. In the children's independent mobility literature, they call this a licence: parents giving a child the licence to be free (Hillman et al. 1990).

But beyond being abducted by strangers, which I will discuss in more detail further on due to its significance in communities such as those in La Paz, there are also many other objects constraining children and their companions from moving freely around their community. The steep terrain of the valley of La Paz, for instance, acts as a barrier; children and their lively companions are likely to be exposed to landslides, flooding and even contaminants if they wander deep into the 'spaces' on the margins. In many countries where cities are built close to rural or forested areas, these marginal areas can also be only places where other non-human animals survive and where important child–animal encounters are likely to happen. Taylor, for instance, in her research with child–kangaroo encounters on her university campus in Canberra, Australia, speaks of kangaroos as urban fringe dwellers. Unwilling city folk who have, like many humans, become landlocked in the city boundaries between major transport arteries. What makes movement 'an easy event for humans becomes a lethal one for kangaroos' (Taylor 2016, p. 10), with over 2000 kangaroos killed on the roads each year. But kangaroos and unruly strangers are not the only risks for children who might move away from the safety of the city landscapes. Risks which are likely to increase in the crowded and degraded landscapes of the Anthropocene.

So, is there a middle ground between benign neglect and eternal vigilance in parenting? If we look to communities in Japan and many Scandinavian countries where children's independent mobility is high, we can see there are possibilities to support that middle ground. While research reveals parental fear of strangers is still high in these countries, rather than driving children to school or other venues, parents and the community have initiated activities to increase children's safety. For example, in inner Tokyo, a neighbourhood has parent safety brigades that patrol the streets around schools and shopkeepers who are signed up as members of the neighbourhood watch programme, and the local council has provided a *mamoruchi,* a GPS-connected device that hangs around a child's neck and connects them instantly to a help call centre. These concrete strategies, while unique to each neighbourhood, are reliant on one critical cultural factor: a commitment by that society to the belief children being safe and being able to walk the streets alone is an essential ingredient of a civil, safe and healthy society. Having social trust, knowing someone is

there to help you and your children if you need help is a central outcome of this cultural commitment. If these freedoms are lost, it not only undermines children's quality of life when they are young but will also have impacts on the adult humans they come to be. In these precarious times of the Anthropocene, unpacking the diversity of children's experiences of freedom and risk and how this is embedded and embodied in the everydayness of them being in relation to the materiality of 'things' in the city seems timely as an essential ingredient for the story of growing up in the Anthropocene.

Movement and Risk

Theorizing and coming to know the meaning of risk and fear has been central in research studies about the conceptualization of how freedom and movement is taken up by children and their city companions (Adams 2006). Risk is often defined as '[a] situation or event in which something of human value (including humans themselves) has been put at stake and where the outcome is uncertain' (Jaeger et al. 2001, p. 19). Declines in children's independence even in cities where exposure to risk has not been seen as a concern in early studies are now reflected in data from England (Shaw et al. 2013); Japan (Driandra and Kinoshita 2011) and Finland (Kyttä et al. 2015). Together, these studies and others disclose that there are broad global and country-level trends impacting children's lives, such as heightened fears around risk, increased urbanization, increasing standards of living and new mobile phone technologies. However, the impact of these trends on children's independent mobility seems to be more localized and varied than general country-wide data might reveal. Risk theory has always been biased towards Anglo-European conceptualizations, although understanding the complexity of decision-making, and how this complexity is expressed through different configurations over time and space, is relevant in the world of the Anthropocene, where we find children are being exposed more frequently to risk and danger. Risk as a social ecological and community process does not restrict itself to low-income or so-called developing nations. Risk and dangers when defined in this way as a social and cultural process are often marked by a desire to locate and manage hazards, disasters and responses as the prerogative of the individual and sometimes the collective. Should we comply, actively support, contest or ignore 'events' as warning signs and try and negate their influence? There is always the possibly in the cityscapes

that a 'chance' encounter or phenomenal event might happen at any time. As a result, addressing risk, especially in children's lives in cities, has often been narrowly defined as looking for ways of reducing encounters with unknown others. Seeking ways to manage children's movements so they will not be exposed to these messy entangled relations with human or non-human others seems often to be the main purpose for regulating children's autonomy.

In contrast, an open interpretation of risks that incorporates the everydayness of living in and with others in complex environments such as cities allows a deeper and diverse knowing of cross-cultural understandings, of how the trade-offs of risk assessment and risk aversion might be different, in diverse ecological communities. Some commentators would say that being exposed to a certain amount of risk that comes with having freedoms to move around cities is positive; it allows children to engage in the life of their communities, including building relations with the human and more than humans entities that reside in community with them. As is discussed in more detail throughout the book, developing multi-species and ecological relations with other entities is often dependent on the opportunities made available for children to have the freedoms to be in, and become a part of their communities. If children's time is so heavily regulated that they become estranged from the world around them, then it is likely they will continue to be informed by Anthropocentric understandings of humans as exceptional to and outside of the planet. Therefore, the continued othering of the planet and its inhabitants will persist.

Despite great interest in children's movements in cities, it has only been the last decade that significant studies across a variety of diverse locations have been conducted, which leads to questions of how other ways of knowing and being in the world may differ in different countries (Malone and Rudner 2016). Historically, key texts such as the work of Kevin Lynch (*Growing up in Cities* 1977), Colin Ward (*Child the City* 1978) and Robin Moore (*Childhood's Domain* 1986) provided the foundations of studies on children's movements in the spaces of the urban environment. The research predominantly documented children's lives in Europe. Lynch was the only one to provide more varied cross-cultural comparisons as he included Australia, Argentina and Mexico. Early studies revealed that overall, children had significant freedoms and engaged in a variety of play activities throughout their neighbourhoods and adjacent areas, but their freedoms still depended on their location within and across countries. Lynch (1977) describes in detail the diversity of children's experiences

regarding spatial range and mobility. For example, children in Salta, Argentina, who were living in a Polish housing project had a very limited range. Children did not move much further than a half square kilometre, which was essentially within the project bounds. In contrast, their counterparts in Melbourne, Australia, were constantly on the move with friends; their roaming range was five kilometres or more. Similarly, ten years later in England, Robin Moore's study (1986) indicated that children had quite broad home ranges. When asked what was the farthest place they had travelled alone or with their friends, these children, like Australian children, they identified destinations a significant distance from their homes and neighbourhoods: 'Paul and Andrew both biked almost 10 miles [16 kms] from Tunstall, to fish; and Stanley Lake a little nearer, where Andrew went, "not to fish" but, as he put it "just to have a bit of fun"' (Moore 1986, p. 20). They also engaged in these journeys with their friends.

Also during this time, the early 1970s, Mayer Hillman implemented his first large-scale study to examine the personal mobility patterns of different social groups in Britain (Hillman et al. 1990). He included surveys (named the children independent mobility survey or CIM) that focused on English primary and secondary school children and their parents in locations ranging from an inner London suburb to a rural village. explored how children travelled to school, visited friends and so on. The findings of the study showed that roughly half of children's journeys were made on foot and that growing restrictions were being imposed on their independent travel (Hillman et al. 1990). The children's parents were also involved in attitudinal surveys and were asked about the age up to which they imposed restrictions on their children and their reasons for doing so. Analysis of their responses revealed that factors influencing the willingness of parents to grant 'licenses' to their children to get around on their own were linked primarily to concerns about the risk of injury on roads and, to a lesser extent, about danger from 'strangers'.

Childhood, as we come to know it through these research studies, is not about becoming an adult in a steady procession, but provides scope to consider the trajectories of children's lives, and in particular their spatial life journeys, as fluid and dynamic—anything but continuous and linear. This includes acknowledging that children's independence in cities and the associated freedoms to engage with the city environment is not merely the consequence of decisions by 'others', but decisions that are constantly

being negotiated and re-negotiated, extended and shaped through encounters with children, adults and lots of other objects and things in the environment. The work of Zeiher (2003) with children in the Caribbean is a useful example here of how children are constantly engaging in these negotiations. She wrote:

> The world around these children provides them with certain opportunities, and indeed imposes certain constraints, but the children themselves deal with these conditions. Sometimes taking, sometimes rejecting, and sometimes adapting them. (Zeiher 2003, p. 80)

Unfortunately, in many studies on children's freedom in cities, the role of children as active decision makers, rather than passive recipients of decisions by 'adults', has often been less visible, as has been the role of the environment to shape children's lives. The studies on children's freedom in place are also often dominated by Western-centric views. These limited perspectives do not acknowledge that the majority of the world's children are growing up in slums or marginal communities where children do not always have the privilege of parents' concerns. For example, parents in majority world nations, who out of necessity, unlike parents in wealthier high-income cities (Benwell 2009; Malone and Rudner 2016), often have to work long days and weekends, leaving children to negotiate the materiality of the world on their own, with other children or their non-human companions. Porter et al. (2010, p. 797), describing children's freedom of movement in urban Africa, for example, writes:

> By contrast with Western contexts this material world is frequently transient: temporary kiosks block pedestrian routeways; torrential rain destroys road surfaces; city authorities send bulldozers to demolish illegal markets; school roofs collapse following termite infestation or high winds.

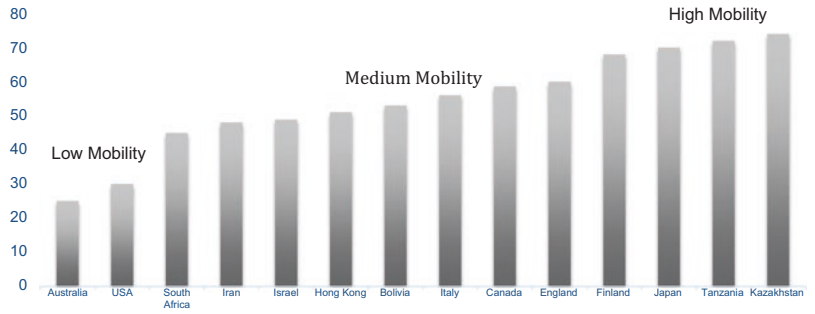
Based on the Western-centric assumption that children are not competent to care for themselves, parents in impoverished situations are often depicted as uncaring, unsupportive and lacking in parental skills (Malone 2007). Many well-meaning NGO projects have focused on this deficit model rather than seeking to understand the complexity of negotiation that exists in the way children, with support from adults, become autonomous beings within their place.

Finally, the impact of globalization on children within studies on children freedoms in cities has not been considered deeply in research. According to Wyness (2006 p. 61), 'Globalization theorists have had little to say about children and childhood and their significance within a global context'. Theorists of the new sociology of childhood, through their focus on reconstructing conceptions of children and childhood, have sought in the past to establish new ways of reinstating children in the stories of globalization, but this has often been done without concern for discussion on cities as ecological communities. While limited in some respects, they do attempt to free notions of the child from a biological essentialist approach and create possibilities for viewing childhood as a dynamic and children as a complex being within a variety of distinctive possibilities (Wyness 2006)—one being a global identity that is simultaneously located within shifting local-global assemblages.

Complex Freedoms

Children's experiences of freedom are not fully explained by their physical environments or children's own characteristics such as age, gender or social context. These data are often not addressed outside of individual country based data, so overall comparisons across countries other than Anglo-European ones are very limited. Adding Middle Eastern countries, African countries and South American countries indicates how assumptions about what is impacting freedom could be determined to be totally different. For example, when looking at data across national results, an indicator like walking to school does little to explain what is really going on in a country.

Graph 5.1 shows a simple graph comparing walking to school data that was collected using CIM surveys from a variety of countries in the 2010–2014 period (Malone and Rudner 2016). Representing high levels of freedoms are cities and communities in Kazakhstan, Tanzania, Japan, Finland; next children from Canada, Italy, Bolivia, Hong Kong are located in the medium range. At the lowest range are countries like South Africa (Benwell 2009) and USA, with Australia having the least of all, with less than a quarter of the children interviewed stating they walked to school. Graphs like this have been used to support the claims that Australia, along with the USA, for example, has the lowest participation of children walking to school, and therefore have children who experience the least amount of freedom. This also verifies long-held views that children in countries such Japan and Finland are in the highest range of mobility and consequently



Graph 5.1 Global range of children walking to school data (Source: Malone and Rudner 2016)

children walk to school more often, with the assumption being that children in these countries receive more freedom than most others. However, what this data does not reveal is whether children cycle, take public transport or take other modes of transport to school on their own or with other children. Nor does the data reveal independent mobility associated with family responsibilities like shopping or working before and after school, and children such as refugees, street children or those with disabilities who may not attend school regularly or at all. For example, in Ghana, Malawi and South Africa, children's independence is strongly associated with schooling, work and family chores (Benwell 2009), and in Kazakhstan, there are around 76,000 children living in 710 state-run institutions with a further 565 in 12 private institutions. None of these children in institutions were available to me to be included in the CIM data surveys, and if they had, the data would have been significantly different as most of these children attend school in care settings.

Tanzania is another example of data being misinterpreted as there aren't enough schools available close to settlements, which means children have to travel long distances and use a variety of transport possibilities (bikes, minibuses, taxis). Hence, recording the walking only partially documents the movement and freedom story. Iran has specific religious and cultural norms that impose gender differences on who has freedoms. In one country such as Israel, different cultural norms between Israeli Arabs and Israeli Jewish mean the data is quite different between these groups, and until it is unpacked, it really doesn't show the fine-grain differences. This was also the same for South Africa, where the research was conducted

in Cape Town. The South African results 'hide' the vast in-country differences between richer and poorer areas, many of which are related to past apartheid regimes. For instance, in the high-income suburbs, car use as mode of transport for school trips was as high as 87 per cent, meaning they were similar to the USA and Australia, maybe even higher than those countries. However, in the low-income slum communities, only 5 per cent of children were driven to school, which meant they would have topped the graph as the highest percentage of children walking to school. Hong Kong is an extremely dense location, one of the densest city landscapes in the world, which influences the walkability of streets due to the many schools very close to homes. This is a very similar case in hand in Japan, where data from Tokyo shows the majority of children walk to school, but as the urban form changes and becomes less populated, these numbers drop, so for a suburban town in Japan, data starts to look similar to averages from other medium range countries. The city of La Paz, which is represented as Bolivian CIM data, identifies that only half the children surveyed walked to school. This was influenced by where children lived, as most children surveyed were from the urban slum communities up in the high reaches of the valley which are a long distance from the schools. To get to school, most children crowded into minibuses (many owned by the families) with other children and adults who were also on their way down to the city centre for work and school. If the question was changed to how children travelled home from school, the percentage would rise enormously. School finishes at midday so children use the afternoon to meander back up the valley streets to their houses. On the way home, many children aren't able to catch the minibuses—they don't have the money or the minibuses aren't frequent enough, as the minibus drivers are in the city working— so they walk alone or with siblings and friends. Gender is an issue that cuts across all the data that is also mostly absent. In most of the cities studied, the data when unpacked illustrated a dominant discourse of vulnerability attributed to the girl gendered lives in the communities. So while the girls may have independent mobility, their freedom is highly circumscribed by fears of abuse and responsibility for their younger siblings (Porter et al. 2010). One of the girls in the Porter et al. (2010, p. 98) study in South Africa told them during a walking interview:

> I fear people who hide in the bush [waiting] for us. They wait for us in the bush and as we walk, especially when you are alone, they grab your school bag with all the belongings that you have with you ... The bush is bad, you cannot see people hiding or seeking you.

As was highlighted in the paper we wrote using this data (Malone and Rudner 2016), a 'global' picture like this can be very deceiving as there are many subtle differences within countries that are the consequence of a range of fine-grain differences and contradictions at the city and community level that is lost in aggregate (a material or structure formed from a mass of fragments or particles loosely compacted together) data. Meanings associated with levels of children's freedoms using only quantitative data, as with most of the studies in children's movements, are limited as the data is unable to take into account the complexity of how freedom is negotiated and how it changes according to fine-grain differences at the community level, influenced by the social, political and ecological landscape. Overall, research collected over many years reveals children's freedom to move around their neighbourhood or city independently with friends is becoming rarer, particularly when the cities are middle class or if the children researched are middle class. By contrast, in slums or developing nations, children are still likely to be moving around neighbourhoods and more freely able to connect with the materiality of the city.

In this chapter on mobility, rather than focusing on the limited CIM data when investigating children's freedom, I am using deep rich postqualitative data where children were asked to map their movements around the community and to illustrate these movements with photographs and stories of how they come to making meaning of places, mobility and how they negotiate their freedoms. Adding to this data from the children, I had also included excerpts from a series of informal interviews I had with one of the young Bolivian researchers I worked together with as she shared with me her own life story as a child growing up in the slum communities of La Paz.

To theorize this work on mobilities, I am using concepts of freedoms, objects as lines of flight and becoming. I have engaged with the writings of Elizabeth Grosz (2010), Tim Ingold (2010) and Deleuze and Guattari (2004). This is all the while I am continuing to engage with Barad's (2007) work this time to apply the idea of intra-action with mark making as an apparatus in order to consider the flow of materials and objects through landscapes as they leave ghostly traces on the earth.

Fear of Freedom

The fear of the 'other' (human or non-human) lurking beyond the forest or in the crowded city streets is an enduring one, and for many parents, keeping children inside or under close scrutiny has been the only way they have

managed these fears. The irony is that when you look at the statistics on abductions in most countries in the world, almost all are by family members (Finkelhor and Ormrod 2000), with the reported number of child abductions in Western countries having gone down for over a decade (Malone 2007). Fear of children being abandoned, stolen or lost is complex in Australia, as an example, has a rich historical story of loss. In his book *The Country of Lost Children*, Peter Pierce, using five actual incidents of 'bush-lost' children, analyses the embellishments that were added to the story of the lost child during the latter half of the nineteenth century. Pierce shows how these stories were imbued with meaning and often reinforced social differences and 'fear of the unknown other'. Children who died or were never found were viewed as passive victims of the romantic but dangerous lure of the 'unknown' Australian bush and toll of life on the margins of European settlement. Their fate stood as a warning of the vulnerability of children in a foreign dangerous landscape. Pierce argued that these early lost child accounts revealed a profound unease about the European presence in Australia. New Colonial Australians were a people persistently fearful of where they were lodged in this 'ecological' place and time, and the lost child became a symbol of their constant anxiety, an anxiety that many say is still deep within the Australian psyche. This is not new in European societies; stories such as *Hansel and Gretel* and *Little Red Riding Hood* heeded warnings to children about the dangers of wandering too far into the forest.

Children's fear of moving around in the natural environment is not new. Some children, especially those who have had no or limited experiences of natural environments or have been exposed to dangerous or frightening experiences of nature, can have long-lasting and influential fears impacting on their movement in places. This was true for young people in Arjen Wals' study of urban life. The teenagers in Wals (1994) viewed natural environments as a threatening place to be controlled and managed based on 'a combination of their own fantasies and the unspeakable acts that occur in local parks, which are often well documented by the media' (p. 132). In their home neighbourhood, the students feared the forest and trees. One student remarked that they would prefer forests with 'just enough trees to give you shade, but not enough for murderers and rapists to be able to hide behind them' (p. 135). Recent studies continue to reveal children's relations with natural environments can often be an uncomfortable, fearful, tricky encounter. Recently Hordyk et al. (2014) when reporting on their study of immigrant and refugee children in Canada revealed that for children coming from developing nations: 'Nature was not a utopian ideal waiting to be experienced by children' and 'human and animal predators made walks in a

forest dangerous past-times' (2014, p. 6). Wals' (1994) and Hordyk et al. (2014) results are consistent with other research studies where 'nature' (including animals) was viewed as both threatening and fascinating (Evans et al. 2007; Phenice and Griffore 2003). Often a blinkered view where parents are 'blamed' for children's limited excursions in nature de-emphasizes a long history of environmental degradation and disconnectedness where being in 'nature' may not have been possible or positive for children. For some parents, their desires to keep children safe from the contaminants of pollution, abuse or violence or dangers of the natural world may have meant they purposely limited children's movements (Malone 2001).

Along with 'nature', as cities became more urbanized, streets have often been the place where contestations of 'power' and 'belonging' for children were being played out. I have in my earlier work (Malone 2002, p. 159) discussed a historical perspective of children and youth in the streets and stated:

> The Vagrancy and Malicious Trespass Act of 1839 in metropolitan London declared illegal a range of activities in the streets, including football, flying a kite or any game considered to be an annoyance to inhabitants or passers-by. Moral panics of the 1850s gave rise to the imprisonment of juveniles as a result of these offences.

In Australia, a similar phenomenon was evident at the turn of the twentieth century, when legislation, colloquially known as the Larrikin Acts, supported the incarceration of many working-class youth who were found to be dwelling on streets. Again in the 1950s, in response to a social view that youth in public spaces were out of control, many young people were told by authorities to move on or they would be arrested (Malone 2002). In recent times in Australia and other Westernized countries, these moral panics over young people being out of control, or alternatively in danger in streets, have led to police curfews, heavy-handed policing and parents being made to feel guilty or irresponsible if they let their children move around unescorted. This perception of young people as potential threats or victims when in their local environment 'places them in an ambiguous zone in relation to space. Many become undesirables and a source of anxiety; others are seen as needing protection' (Malone 2002, p. 162). Non-human animals are also often positioned in similar ways to these free roaming children in cities. As urban pests, who are 'out-of-place' these animals pose a risk and are moved on or exterminated.

According to UNICEF (2016), 'Millions of children worldwide from all socio-economic backgrounds, across all ages, religions and cultures suffer violence, exploitation and abuse every day. Millions more are at risk'. The

most vulnerable children are those who are orphaned, in institutions, are from ethnic minorities or other marginal groups. Living or working on the streets, living in communities with high poverty or unemployment, being in areas exposed to natural disasters or armed conflict—all these expose children to additional risks. Children are killed by vehicles or abducted from the streets and trafficked to work as child labourers, prostitutes or domestic help. Children are married off to men with or without their own or families consent. Children are abandoned or give up to be orphans in institutions and adopted through international agencies to white American families. All these scenarios are commonplace dangers for children in many countries around the world, including those I have researched. Add to this around 50 million animals, wild and pets are killed in cities by cars alone around the world. Freedom comes at a cost in the city landscape.

The complexity of environments, whether discussing humans or non-human elements, adds to the challenges of documenting children's movement and their response to risks. Absent also from research on children's freedom and movements in communities is the issue of transient or episodic mobility connected with street children, refugees or the homeless. Natural disasters, armed conflict and displacement expose children to additional risks and the likelihood of being on the 'move'. Child refugees, internally displaced children and unaccompanied migrant children are often populations of significant concern. Vulnerability to risk increases the younger a child is. The number of refugee children displaced from their families and on the move due to war (often over dwindling resources) or natural disasters is increasing, and is likely to continue to rise as climate change and other global events make more places inhabitable for children. These transient groups of children are often invisible in city environments. Van Blerk (2005) in her study on street children in Uganda provided some interesting insights into the social relations that existed between street children and others, and how these relations shape the way and how children construct freedom in their everyday encounters of places. She identifies how localized studies of street children provide valuable insights into their 'daily micro-geographies', although missing from these accounts are 'their wider temporal movements'. She also highlights how 'power' and 'ownership' of public space are shaped through these encounters and the ways children come to understand how they must negotiate the boundaries of the space and 'its internal homogeneity and order' (Malone 2002, p. 148). Children on the streets come to know whose concern it is to maintain these boundaries, those who 'keep out objects or people who don't fit into the shared classification (or culture) constructed by the

dominant group (the insiders)' (Malone 2002, p. 148). Freedom is an act of action; it is not a property, it has no content and it can't be defined. Therefore, there is no order in providing freedom; it only exists through 'the "autonomy" of the living being against a background of routinized or habituated activity' (Grosz 2010, p. 148).

Grosz (2010), drawing on the work of Bergson, writes about:

> an understanding of freedom that is not fundamentally linked to the question of choice, to the operations of alternatives, to the selection of options outside of the subject and independently available to him or her. It is not a freedom of selection, of consumption, a freedom linked to the acquisition of objects but a freedom of action that is above all connected to an active self, an embodies being, a being who acts in a world of other beings and objects. (2010, p. 147)

This concept of freedom, one that acknowledges the entangled assemblages of children, objects and others in a world acting together, is valuable in a world where increased uncertainty and manifestations of risk, real or imagined, will be central to living in the damaged landcsapes of the Anthropocene.

Entangled Configurations

Phenomenon could be described as the intra-action between an object and its surroundings. This intra-action leaves discernible marks on those surrounds so as to constitute them as a measuring apparatus of the intra-action. Barad (2007, p. 335) argues:

> apparatuses are not merely human-constructed laboratory instruments that tell us how the world is in accordance with our human-based conceptions. Rather, apparatuses are specific material configurations (dynamic reconfigurings) of the world that play a role in phenomena.

Barad uses the term 'intra-action' to describe how two poles of a phenomenon, the object and the apparatus, do not exist as such apart from their intra-action. What is measured by those marks of intra-action, however, is not a property of the object in isolation, but of the phenomenon as a whole. The children in the three neighbourhoods of La Paz were asked to draw on a map of their movements through the landscape. These marks on the map are as Barad alludes to a 'measurement

of intra-action'—they record the ongoing dynamics of boundary making (and marking) practices of children within the landscape. The marks provide a record of each neighbourhood and how children move differently and together through these landscapes. And as they move with and through landscapes they intra-act with objects, they leave ghostly traces of their past and present becommings.

The maps provide images of children's movement not as autonomous individuals but rather as a collective phenomenon of child–city movements; they are material dynamic entangled objects. The marks of city landscape provide entry points for observing the entangled nature of practice as it unfolds:

> [P]athways or trajectories along which improvisatory practice unfolds are not connections, nor do they describe relations between one thing and another. They are rather lines along which things continually come into being. Thus when I speak of the entanglement of things I mean this literally and precisely: not a network of connections but a meshwork of interwoven lines of growth and movement. (Ingold 2010, p. 3)

In this way of acknowledging the marking of child–city–bodies in the landscape, there is an accountability to the world as being material, which for Barad (1996, p. 188) 'is not about representations of an independent reality, but about the real consequences, interventions, creative possibilities, and responsibilities of intra-acting within the world'. Knowing the world by participating in the configuration of phenomena makes one accountable for all of their consequences (Fig. 5.2).

The marks on the landscape portray the messy flowing streets of Munaypata following the valley terrain and the means through which children have individually and collectively devised complex pathways through the congested urban landscape. The steep crammed valley, with houses built on top of each, provided no space or paths or roads. The heavy flows of movement are connected to activities within streets, open areas, parks, playgrounds and sporting fields. The flowing in and out of the central area that is the neighbourhood of Munaypata tracks the means through which children enter in and out of the space along the ravine edges to move downtown to where the schools are and where their parents are working. They return back up the ravines to the neighbourhood where they find small areas of open space, some earth to play out of eyeshot of adults who may have presented risks (Fig. 5.3).

Fig. 5.2 Munaypata child–city–movement map

Fig. 5.3 Complex entangled streets of Munaypata (Photograph taken by Sebastian, aged 6)

> In our free time we played just on the earth, we didn't have a play ground we just played with the air, go to the garbage play on the garbage. In my neighbourhood before was so dirty, the river was open and you can smell the water was dirty. And people other communities use to come to there to throw all the garbage near the river and some factories carry some magazines books to throw out near the river and we as a child use to run to see what they had thrown. Maybe we can get some magazines things like that. That happened when I was 10 years old. I remember always I use to have dirty clothes. (Elena's reflections on a childhood in the communities of La Paz, recorded interview 2014)

According to Leary (2015, p. 8), 'Mobility is also often entangled with feelings desires and emotions, and indeed certain mobilities, such as say pilgrimages, may be undertaken in order to generate a particular feeling or emotion'. Children's movement and freedom as represented through their intra-acting with and through the dirt, dust and water of the ravines provide insights into the materiality of being with the earth through an embodied reality of moving through place. It is not the place or destination

that is central to these child–city–movements but a mobile materiality that allows the child's entangled world to be revealed. Or as Ingold (2010, p. 3) entices us to consider, 'a focus on life-processes requires us to attend not to materiality as such but to the fluxes and flows of materials' (Fig. 5.4).

Life, according to Deleuze and Guattari (2004), is developed along thread-lines (Ingold 2010). These thread-lines of life are referred to by them as 'lines of flight' or 'lines of becoming'. Like the markings of the children through the landscapes of La Paz, these are not lines that connect; they are the unfolding of possibilities for how materiality is flowing through the spaces between the earth and the walking. A freedom of flow is taking up agency through child–earth becoming. 'A line of becoming', Deleuze and Guattari write:

> is not defined by the points it connects, or by the points that compose it; on the contrary, it passes between points, it comes up through the middle … A becoming is neither one nor two, nor the relation of the two; it is the in-between, the … line of flight … running perpendicular to both. (2004, p. 323)

The 'thing' the gathering together of lines of flight, according to Ingold (2010), is how Deleuze and Guattari explain the concept of a 'haecceity' (2004, p. 290). The haecceity or thisness of things is represented through this mapping of collective lines of flight. At the centre of the Tac Gua map, we can see a number of swirling lines centred around a particular object. The object is the play and sports space—it is also the centre where we held our workshops. Running vertical to these, the crooked lines illustrate the staircases where children can exit to the top of the valley and ravine into the El Alto or horizontally outwards into the forested disused vacant blocks where the valley is so steep, constructing houses or stairs is impossible or what was there has now been lost, washed away by a landslide. Walking, walking, carrying, carrying, puffing, puffing—up the steep staircases. The pathways are empty. Bare dirt fills the spaces in between. Hidden from view, the narrow walkways look out across the valley (Figs. 5.5 and 5.6).

> I walked. I always walked I never took the car or bus. Because the road I use to go was hilly and when it was the season of raining – the road was earth, the road was slippery and I use to fall down and I remember my shoes were always dirty with all the earth. With the earth that's what it was like.

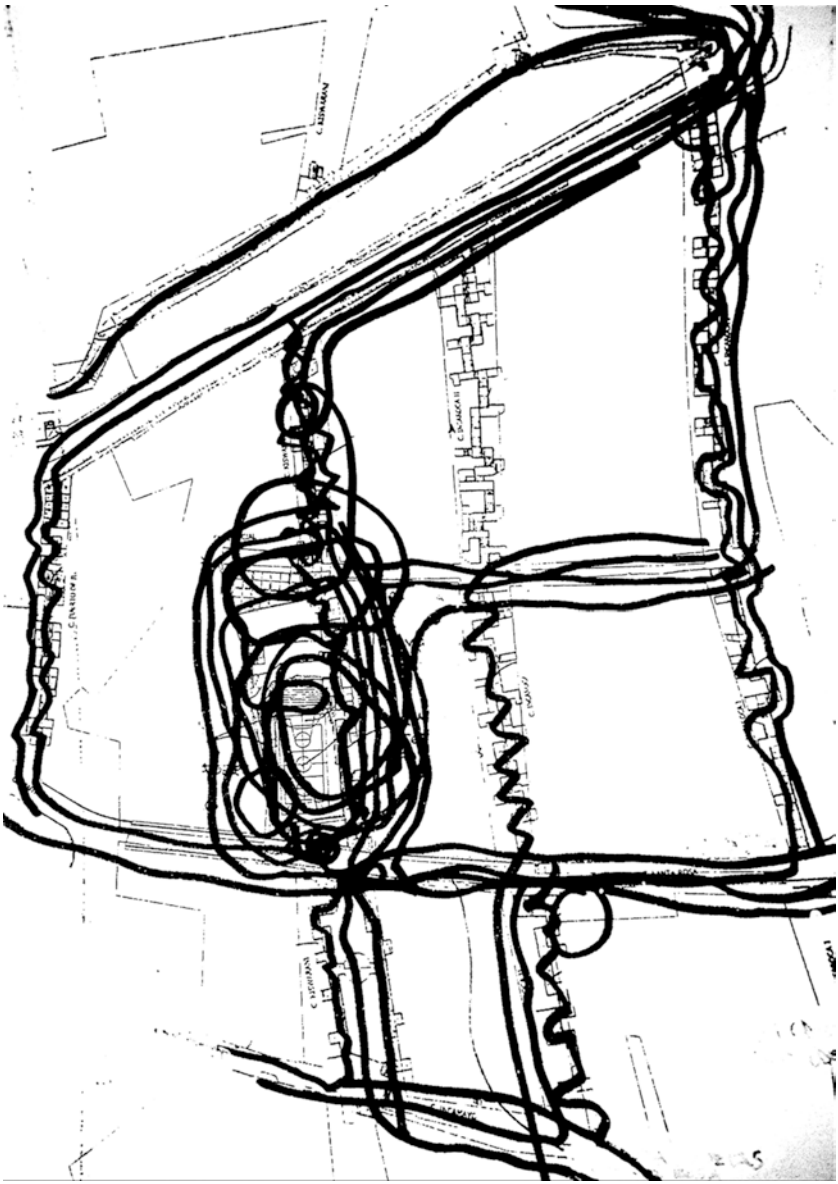


Fig. 5.4 Tac Gua child–city–movement map

Fig. 5.5 Staircases of Tac Gua (Photograph taken by children during walking interview)

> We get access to the football field, was field near the river too and we use to go and play and run or play football. We didn't get access to a good real playground it was too far away. (Elena's reflections on a childhood in the slum communities of La Paz, recorded interview 2014)

Ingold (2010) explains the concepts of lines of light and flow as linked to his notions of network and meshwork. He likens it to a spider's web. The collective child–city–movement maps, unlike the mapping work by Ward (1978), Moore (1986), Chawla (2002) and Driskell (2002), who use spatial maps to identify the boundaries of children's roaming range focus, record spatial networks as complex intra-actions between human and non-human objects. Children of Cotahuma circumnavigate the valley ravines, the steep edges fall away as they walk. Reynaldo included a photograph of the obstacles along the pathway for children. 'I don't like it here because there are ravines, people fall and it is a dangerous and ugly place. A young person fell and that scares me; I want it to be closed off so no more people can fall' (Fig. 5.7).

Fig. 5.6 Cotahuma child–city–movement map

> The lines of the spider's web, for example, unlike those of the communications network, do not connect points or join things up. They are rather spun from materials exuded from the spider's body and are laid down as it moves about. In that sense they are extensions of the spider's very being as it trails into the environment. They are the lines along which it lives, and conduct its perception and action in the world. (Ingold 2010, p. 12)

Fig. 5.7 Photograph of obstacles on children's paths in Cotahuma (Photograph by Reynaldo aged 8)

The spider weaves its threads starting from the centre, building layers by knotting carefully each thread. The boundaries are created by supporting the trailing of loose ends that fall away. The network of lines, the flow of materiality of child–city–movement, provides the possibilities for real and imagined journeys where the human and non-human are connected. The defining attribute of a network of flow lines is their potential for connectivity.

I am reminded of something when I look at these child–city–movement maps of habitat or wildlife corridors. When I was working with schools many years ago, we often engaged in tree planting projects with the purpose of creating habitat corridors. Corridors act as points of connectivity for wildlife and are known to contribute to re-establishing populations that may have been impacted by natural disasters such as fires or disease or whose habitat has been reduced because of events such as deforestation, landslides and road laying. Habitat corridors encourage the movement of animals and plants along specific lines of flight in order to create a safe passage through a space, in order that species can flow. According to research,

wildlife corridors should be built with randomness or asymmetry, rather than being symmetrical. I have often thought as cities become more urbanized, it would be useful to take maps such as these by children to guide us on how to identify and support safe flow lines for children in order to encourage their safety and freedom. Even though the majority of habitat corridors are planned as a means for limiting intra-action between humans and non-human animals, creating green buffers, pathways or bridges so non-human populations can move to patches of habitat without dangerous encounters, I wonder could they be planned to encourage encounters? The difficulty with identifying where a corridor might be located is that most species aren't always consistent in the way they move through the environment. Mostly species (humans and non-humans) meander opportunistically through landscapes with daily, seasonal and dispersal movement behaviour.

Lines of Flight: Ravines as Risky Matter

> In perceiving movement of poeple or other living things we may sometimes inadvertently 'freeze' the landscape. People or animals move, but the landscape stays where it is. Even when shifts of terrestrial surfaces and patterns are taken into account, it is easy to see these as mainly driven by human forces or the effects of human agency, with no comparable forces seen to be operating in the other direction. (Edgeworth 2010, p. 49)

The landscape is an assemblage with flows of materials running through it: rivers, rocks, earth, sunlight, wind; it is a moving omnipresent, not a static backdrop to human or animal activities (Edgeworth 2014). The high slopes are the most unstable with lake sediment deposits. The higher, steeper slopes are also the wettest; they are by far the most landslide-prone slopes within the city. The houses are swept away, buckled and broken slowly with the earth slumping, the movement edges its way down the valley slope. Houses containing children slip down the valley.

The settlements where the children live sit in a valley surrounded by spectacular mountains. The view is extraordinary but a closer look reveals a serious reality:

> Reaching out from the urban center and making their way up the mountain slopes on all sides of the bowl are the slums and shanty towns of La Paz. Here, plumbing and electricity are scarce or non-existent, roads sit unpaved and the escarpments that afford such distant photogenic vistas conspire to create an ideal setting for floods and landslides. (Weatherby et al. 2011, p. 96)

In the self-built areas, water is often taken from underground or is filtered from poor-quality river sources. Water from the main city below is piped to certain areas but landslides continually damage and sever this supply so that water from stand pipes often has to be fetched up to dwellings by trucks or buckets.

Landslides and their effects impact the families living in the settlements for a number of reasons. The environment of La Paz city is landslide active because the steep slopes are covered with soft earth deposits that are easily dislodged with wind and rain, and the activity of building moves and displaces the dirt. The area is also impacted by water movement coming from Lake Titicaca, a high-altitude lake that sits high above the valley floor. Rapid growth and the influx of poor people drawn to the city with a desire to build houses mean construction is often based on minimal materials and resources. This demand has also resulted in informal, self-built housing being constructed on the steepest most unstable slopes of the city. Finally, without a clear city planning framework, the city had continued to expand with properties being built on the city's treacherous slopes, without care or acknowledgement to the materiality of the earth and its limitations, its constitution as a body containing a past and present history as a landslide hazard.

> When I was a child there was a landslide. My house was on the edge where all the other houses near me all fall down. Ours was the only one left. We stayed in that house on the edge of cliff for five years after that. When my house was on top of the edge my mum and me still stayed there but my bedroom did not have a door – we had a small place to walk but my porch and the other part of the house fall down. We just put some wood and have to use a ladder up the cliff to get to the house. We had to carry the water it was very difficult. That's when my mother decides to rent a different house. In that house I was very sacred. When it starts raining I am afraid scare maybe the house will landslide again. I had my packed ready to go some I have to take it with me. I remember I was scared for strange people as I have a ladder to go to the house was always there what happens it someone comes into the house. Sometimes my mother had to work two times at night and I was alone. I only have my cats. I was so alone. I feel insecure. I didn't go different places because I was too sacred to leave the house alone. My route was school house school house, that was all. I now back in the same house on the edge of the cliff. And now even though the government has given tenure to some people in communities this house cannot because it is on very dangerous land and so we cannot own it. (Elena's reflections of a childhood in the slum communities of La Paz, recorded interview 2014)

The most vulnerable group exposed to the landslide hazard comprises the inhabitants of the self-built informal housing areas who occupy the more elevated steeper slopes of the northern part of the city. But societal vulnerability to earth movement in the city is widespread and interconnected. Landslides in the city of La Paz, Bolivia, are complex in space and time. Their distribution within the city is differentiated by geographical variations in slope gradient, the nature of overlying surface deposits and drainage density patterns. When mapped, the distribution of the most landslide-prone locations in the city coincides with the most mobile surface deposits on the higher and steeper slopes of the city. The timing of landslides is triggered when slope materials become saturated with moisture by rainfall, stream water, water seepage from high surrounding water tables, and from domestic sources. The slums are the first and often last stop for those rural drifters and those who come to the city with expectations of a better life and employment. Living in the steep slopes of the valley in La Paz has unique and significant dangers for children and their families. Constant landslides, fires, limited public transport, strangers, street dogs and inadequate policing all add to the daily difficulties children experience when on their own or with friends moving safely around the community.

Children in the communities speak of many dangers in the physical environment, but also other concerns about their health due to the lack of fresh water, the dust and dirt in the air, on the street and in their houses. The children, when taking photographs of their life experience, took many photographs of dumped rubbish in the streets and ravines, where scavenging streets dogs could be found hanging out, fighting among themselves and frightening the children. The fear of being taken, abducted or hurt by strangers is real, and during a guided tour, the children in one neighbourhood took us to a wall in the community centre where the faces of lost children hung as a reminder to them of the risks. These slum communities in La Paz with their narrow steep steps and winding laneways, children who need to make their way alone or with friends to access school, shops, playgrounds or their homes are a familiar sight in many Latin American countries.

> As children as we had a small house – our bedroom was small we have in the same bedroom two beds, our kitchen, our small kitchen and just that. We didn't have a bathroom with all the sanitary services. We didn't have that

> and we use to go to the ground. Out to the bathroom we play in the same places, where go to the bathroom we play – and that is still here. I see that in the communities now I work I see that I see my reality, I say I use to be that child. But the part where we live, the property used to be a place where there was landslides. It is not secure land. And that is the reason why my grandfather never put the services. They water we didn't have water no water no sanitary services we didn't have that. We had to carry the water from the branch? Near the river was a little river with water we carried water. (Elena's reflections of a childhood in the slum communities of La Paz, recorded interview 2014)

The unstable slopes, the dirt and rubbish are important issues children discuss with us during the walks. Children spoke of dumped rubbish in the streets and ravines where they would go to collect water or play. Most children had a photograph in their research of rubbish or dangerous ravines close to their homes where they felt unsafe. Children in Taca Gua particularly noted more than others that there was rubbish dumped near their homes. They also have no access to water or sanitary conditions, so they have to collect water from a central location and often go to the toilet in the earth close to their house. For many like Jonathon and Ricardo, they fear that the houses they live in are precariously located on unstable hillsides and they worry for their safety. The following is a walking story by Juan where he took photographs as he walked home from school:

> I live in Cotahuma. I took this series of four photographs as I was walking up the slopes towards my house after school. The one here is the second in my series. I took this photograph because this canal is dirty, it is at the start of the way to my house. I don't like this place to be like this because it looks bad and it makes the area look bad. It is as we are getting to my house, at the lookout. I chose this photo because it is a ravine and it is dangerous, it is so dangerous they need to close it. It is the same ravine, the one that is very dangerous because many people fallen, I think they need to close it because a lot of rubbish is dumped there and lots of people and wildlife fall in. It is just around from my house. I chose this next photo because it is very dirty and the owner of the house doesn't clean it. There is lots of rubbish, but the good thing is that the steps are not dangerous. I don't like to walk through here because it is very dirty but I still have to walk through here anyway. This is a photo of where I bring water down from; it is very dirty and very dangerous. The sports field is above too and if the ball falls I have to go and retrieve if from the pile of rubbish. I am worried walking through here especially when it is raining hard and the flood waters may come over

> the edge of the ravine and wash away my house with me and my family and my dog. See this final photograph I took this photo in El Alto and I don't like the rubbish and it makes it look bad where they go and the dogs stop here and they can bite you. I walk a long distance sometimes because the valley is so steep. There is not always roads or stairs so we make our own tracks through the dirt. (Juan's walking story from school to home)

Gabriel, like Juan, provides images of the ravines: 'I don't like this place because many people have fallen from here, it is very dangerous'. In response to a similar photograph, Dayana, aged 12, also from Alto Taca Gua, said: 'I am afraid of this place, it is dangerous, I get very scared'. Ronaldo, aged eight, from Cotahuma also commented on the dangerous ravines: 'I don't like it here because there are ravines, people fall and it is a dangerous place, this place is ugly'. Building houses on the hilltops also causes many problems that the children are very aware of. Ricardo, aged ten, from Cotahuma, took a photograph of a pile of rocks that he tells us used to be his home: 'It's my house but it has fallen down, it was ill constructed'. He then shows us a photograph of the house he now lives in, which is also showing signs of collapse: 'It's my house, the cracks are there because it was ill constructed and all the houses in my area are also falling down, the tree roots destroy the houses'. Jonathan, aged nine, from Munaypata, also includes photographs from his neighbourhood showing houses precariously hanging on the edge of the hilltop. He describes this: 'These houses are hanging dangerously, one of them is collapsing, the one with the nylon hanging out the front is mine'. He includes photographs close to the hanging houses and his house where there are piles of dirt and lots of rubbish: 'A pile of dirt and lots of dust nearby my house which is collapsing and there is a lot of rubbish' and 'lots of rubbish below my house'. What Jonathon alludes to in his photographs and descriptions is that beyond the dangers presented by the tree roots and slopes, the ravines and the now mostly empty riverbeds have become dumping grounds for rubbish. Alan, aged ten, from Alto Taca Gua, is also concerned about the rubbish in his neighbourhood and that the lack of rubbish bins: 'There is always rubbish here, there are no rubbish bins. I would like there to be rubbish bins because the rubbish gets into the storm water'. Sebastian, who was aged six, lived in Munaypata, which is a community a few kilometres across the valley from Alan in TacaGua. But Sebastian has similar concerns about the rubbish, and in his drawing of the neighbourhood, we see he draws his neighbourhood streets and includes an area of open space

with rubbish. He described his drawing by stating: 'This is the place I like least. It is full of rubbish and they drink too much'. Sebastian also took photographs of him in his neighbourhood. It shows the view across the neighbourhood near his house. When describing this photograph he told us: 'This is close to my house I took it to show you that we have poor, dirty neighbourhoods and people that drink' (Figs. 5.8 and 5.9).

Yesonia is from Munaypata and took me on a tour of the neighbourhood. She takes photographs as we walk and talk. At one place she stops in front of a large dump of rubbish: 'I want to show you the rubbish that people dump and the dogs that go to the toilet; it's a place that is close to the house. I hate it, it smells'. While many children often talked fondly of the dogs in their neighbourhood, many children stated that dog faeces was a real concern for them. A number of children were also worried about the dangers of street dogs that might bite them and some recalled friends or relatives that had been bitten before. Luz, aged 12, from Alto Taca Gua, was also concerned about the rubbish in her neighbourhood and its impact on the environment. She describes a photograph she has taken this way:

Fig. 5.8 Photograph series 1: Walking up the valley (Photograph by Juan, aged 15, Cotahuma)

Fig. 5.9 Photograph series 2: Walking up the valley (Photograph by Juan, aged 15, Cotahuma)

> The rubbish is what contaminates the environment and it is what I don't like about the area. They dump rubbish everywhere the rubbish bins are there in vain because they don't use them because they want to contaminate the environment.

Many children said they wanted more police in their community and more policing of bad behaviour by adults. Ricardo, aged ten, from Cotahuma, dreams of place to live where there is: 'more police control because a thief broke into my house and because there were no police he escaped'. Gabriel, aged 12, from Taca Gua, supports this when he stated: 'My neighbourhood is not that safe, there aren't enough police'.

Mostly children in Cotahuma said they knew where to go or someone to help them should they need help or when in danger. But the children in Manaypata and in Taca Gua were worried that there was no adult around to support them when they went out into the neighbourhood, walking. Most parents in all neighbourhoods believed other adults would help their children. Children were asked if they felt safe travelling alone and their responses were quite varied but more likely than not to say they never felt safe. What this reveals is a sense of real dangers for children in

the public spaces, and being kidnapped or hurt by others is a significant worry for them. In Cotahuma, children showed us where in the welfare department a whole wall that was dedicated to photographs of lost, possibly kidnapped children. Most children could name one child they knew or had heard of that had been kidnapped. This is very frightening and while some of these may be related to domestic disputes or other family issues, children are also aware that they could be taken off the streets and kept captive in child labour rings, trafficked to other places, and for girls even the possibility of prostitution. Flow and movement of bodies are not always embodied as an action of freedom. I took a photograph of the wall as we walked away (Fig. 5.10).

Conclusions: Enmeshment and Creative Entanglement

'Ways of movement vary radically depending on the terrain one is moving through' (Leary 2015, p. 11). Sheller and Urry (2006, p. 217) argue that while much of the research on movement is conducted at a distance it should also be equally concerned with 'the patterning, timing and causation of face-to-face copresence'. The texture of the ground, steep slopes, loose earth; the weather wind, rain, darkness; vegetation forests, woodlands and the others that we share the ground with all influence and force certain types of movements, freedoms, constraints and mobilities (Leary 2015). And as Ingold and Vergunst (2008b) remind us, we are in relation with a world teeming with a vast array of non-human animal life, all of which influence how we move, with whom we move through the landscape and the trails we leave behind (Leary 2015). A child in the city is affected by all these things. But beyond the immediate landscape, they may also come to know through their meanderings, the leftover marginal allotments close to their homes and the complexity of their enmeshment with other entities animals, rocks, trees who they come into contact with. The mobility and freedoms of children are being influenced by the entangled and complex world beyond them, a world that is increasingly posing a host of heightened risks in the Anthropocene. Children in these precarious times navigate the risks and dangers of natural disasters, fearful parents who restrict their freedoms, strangers and wild animals real or imagined lurking in the shadows ready to pounce. Mobility is not simply movement, just as freedom is not just about being 'free'. The act of mobility is imbued with meaning, described in Leary's archaeological world of movement as 'an ensemble of freedom, opportunity, adventure and progress, and yet it was also a form of restriction' (2015, p. 11).

Fig. 5.10 Wall of kidnapped children (Photograph by the author)

Aldred (2014) writes: 'there are several ways to inhabit movement. To move through a landscape is to dwell in movement, occurring when relates to and reflects on the material world as it is experienced and moved through' (p. 31). In this chapter, I have sought to compress time and space through the study of movement patterns connected to stories and images over time. It is a collective and individual story. I have, through children's child–city–movement maps, stories and photographs, acknowledged that 'human actions and mobilities are enmeshed with the actions and mobilities of flowing materials' (Edgeworth 2014, p. 58). I am attempting in this work to theorize flow and freedom differently than the CIM aggregated data that tells an anthropocentric and Western-centric story of children and mobility. By applying freedom and flow through the work of Grosz (2010) and her understanding of freedom as an action I am viewing landscapes as the flow of materials in the forms of rivers, streams, landslides with people and animals moving with or against such forces. Consequently, by applying Barad's (2007) tools of intra-action in order to trace this flow of materials through landscapes, as means for recording the ongoing fluidity and dynamics of objects, I have supported this turn in theoretical framing using Ingold's (2010) notions of enmeshment and creative entanglement. Movement and freedom can be embodied, performative, inscribed with pleasure, fear, conformity and transgression. It is through walking, moving through the city with children, that I have come to know the complicated negotiation children perform with a host of others 'moving at different scales and rhythms yet interacting and enmeshed with each other all the same' (Edgeworth 2014, p. 49).

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CHAPTER 6

Animals: Multi-species Companions

> what appears to human beings is not all that appears, that what affects human beings directly is not all that has effects, that what has significance in its appearance to and effects on human beings has different significance for other beings (Smith 2013, p. 24).

Deborah Rose Bird, in her book *Wild Dog Dreaming*, writes from her learnings with Australian Aboriginal people, who as her teacher reveal through stories their kinship relations with others, this is called 'the Law'. 'Their stories are always grounded in specific places and creatures,' she writes (2011, p. 4). Rather than offerings, Aboriginal people 'sing up country' to acknowledge the relational human–non-human entanglement. 'Singing up is always specific. People sing up their own country, their animal and plant relations, their water and rain, their stories' and 'Singing up expresses powerful connectivities founded in knowledge recognition, care and love' (Bird 2011, p. 62).

The Quechua and Aymara people are the two largest indigenous groups in Bolivia. The children we work with are from one of these two groups. Evo Morales, the current president of Bolivia, is of Aymaran descent, and as the first indigenous leader, has supported policies that enhance the opportunity for the indigenous communities to speak of and seek to live in harmony with Mother Earth. In the stories told to me by my Aymaran guide, Pachamama beliefs are based on the view the relations between human–animal companions as dynamic, and humans who are guided by Pachamama are in relation

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with a 'spirit animal'. According to these Pachamama beliefs, nature provides humans with a diverse set of spirit animals, sent as allies during the 'human' journey on the planet. Central to this belief is that humans and non-human companions depend exclusively on what the earth provides, and Mother Earth or Pachamama is the source of all life, human, non-human, soil, air, water. Ancestral ceremonies, rituals and offerings of animals to Pachamama are entwined with a profound sense of respect and gratefulness, as a sign of retribution and reciprocity.

Child–animal relations co-shape shared worlds. Children and animals 'being together' as multi-species companions within city spaces is the focus of this chapter. In particular, this chapter explores how children and dogs become deeply entangled in a place like La Paz. How they co-inhabit a shared relational world. In the process of reading the 'intra-actions between child-animals in La Paz' pouring over the photographs and drawings, the stories by the children and the walks in the streets and forests, I have sought to be mindful to notice the way humans and non-humans can slip out of the grasp of classic hierarchical structures. This re-reading of animal relations through the children's encounters 'enables' the child–animal relationships to reveal a new plane of intra-subjectivity. Rather than thinking through the child's relation to animals (nature) by elevating animals to the status of the children, or de-elevating the child to the status of an 'animal', in this posthumanist reading of child–dog in La Paz, I have sought to unpack political, ethical and ontological questions without enforcing a traditional human–animal distinction. I am wanting to notice the space between the subjects; to be a child or a dog is no longer to define difference but to seek collective, shared resemblances. How do child–dog in La Paz exist in everyday environments, shaping and being shaped by each other and by other things? Knowing the environment of La Paz with and through human relations with dogs as depicted through photographs taken by the children allows for a deconstructing of the nature–culture binaries and the revealing of their inconsistencies. I am hoping this new way of reading animal relations could be an entry point, a way to pry open new understandings about how we can 'be' on the planet with others:

> To take back our personhood in relation to other animals changes everything. Anyone who seriously engages in this task comes to realize that our planet is replete with opportunities to form personal relationships with many different kinds of beings. Even if most of us end up forming bonds only with domestic animals, it is important to fully digest the fact that

> millions and millions of potential nonhuman friends exist in our forests and oceans, savannas and swamps. Radically rethinking our relations with other species can change the future; for example, in the context of an endangered species, what if we expanded our concerns about the disappearance of an abstract category to include the concrete reality of death by starvation or disease or poaching or multitudes of feeling, thinking, relational individuals? (Smuts 2006, p. 118)

Like Taylor and Pacini-Ketchabaw (2015, p. 512), I am reiterating that we are implicated in our existence on the planet through our multi-species companions, and 'despite the human predilection to reiterate human exceptionalism, including within many epic and heroic narrations of the Anthropocene, the fact is that our human lives are totally dependent on the lives of other'.

Research studies on children's encounters with animals in everyday urban life often identify how children can be both fearful and fascinated with the 'things' they encounter. As discussed in Chap. 4, Wilson's (1984) 'biophilia' hypothesis supported the view that encounters with close by nature supported children's connection to, and the innate desire to be part of, the natural world (Louv 2005). The question whether or how interactions with animals, at home or in other childhood settings, can contribute to a change in children's long-lasting view of animals or their relations with animals is an interesting one, and while it could be seen to be very romantic to imagine these encounters are always positive ones, it is not always the case (Bone 2013). For instance, Haraway notes that dogs do the hard work of keeping up relations with humans as 'the risk of abandonment when human affection wanes, when people's convenience takes precedence, or when the dog fails to deliver on the fantasy of unconditional love' (2003, p. 38). What is the work of humans on keeping up relations with animals? Ruth Wilson (1994) in her earlier work described children expressing fear, dislike and violence focused towards animals when in the environment. When close to butterflies and baby birds, she observed children's responses included: 'Kill it,' 'Grab him and rip him apart,' and 'Step on it'. Violence towards the more-than-human world by the children can be contradictory and ambiguous. In a study with toddlers in an early childhood setting, I found that children collected grubs so they could explore human–animal possibilities, including crushing and killing worms and witchetty grubs, swinging them to scare others and to show their power in controlling their bodily behaviours. Children and the

material objects (grubs and worms) were influencing and knowing human and non-human bodies with and through intentional and unintentional actions, squeezing, burying, challenging, enticing, child and animal were embroiled in a series of complex co-productions (Malone 2015). Throughout the grub encounters, the children simultaneously love, hurt, help, free and take captive the animals. Recently writing on this child–grub study, I said:

> Representing the messy, often contradictory reality of all human-animal relations: butcher, hunting, farming, loving, death, pets, food, animal rights. These are important learning opportunities, and through the enacting of posthumanist pedagogies and shifting away from the child as the central object of our gaze by being attentive to and noticing the nonhuman entities through which their world is being encountered, these narratives can support an un/learning, a new imagining for sustainability. (Malone 2015, p. 18)

This uneasiness, the tensions in the child–nature, child–animal relations, is also revealed in the children's stories of being with dogs in the stories of La Paz. Dogs who are both friend and foe. That is, rather than reproducing child–animal relation as special 'kin', which has been done in previous work using posthumanist theorizing (Tipper 2011; Taylor et al. 2013; Malone 2015, 2017), the research informing this chapter explored the intimate intra-actions between child and dog bodies as difficult animal mattering. Fox and Alldred (2014, p. 2) explain: 'Matter', according to Barad's (1996) notion of new realist materialism, 'is not inert, nor simply the background for human activity, but "is conceptualized as agentic", with multiple non-human as well as human sources of agency with capacities to affect' (Taylor and Ivinson 2013). By approaching this understanding of matter as agential and using intra-action, it implies these 'interdependent entities' (child and dog) 'are taken to co-emerge through simultaneous activity: to come into being as of a certain kind because of their encounter' (Rautio 2014, p. 462). Or as Haraway (2008 p.226) articulates in *When Species Meet* as the enmeshing of species, these human–animal entanglements reach beyond humans speaking for other species:

> Disarmed of the fantasy of climbing into heads, one's own or others', to get the full story from the inside, we can make some multispecies semiotic progress. To claim not to be able to communicate with and to know one another and other critters, however imperfectly, is a denial of mortal entanglement (the open) for which we are responsible and in which we respond…

> Response is comprehending that subject-making connection is real. Response is face-to-face in the contact zone of an entangled relationship. Response is in the open. Companion species know this.

Dog–Child Relations

La Paz is a city of half a million dogs and 1 million children. The dogs and children I am researching live in the slum communities of the upper reaches of the valley. My first encounter with a street dog in La Paz was on the first day of my research work. I had just arrived and was visiting the Witch's market. It is where you go to buy white baby lamas and other essential elements to use during the frequent Pachamama offerings. As I was walking around, a small street dog started following me. She could probably smell the food in my backpack or maybe she was accustomed to looking sweetly on tourists. I have to say I was smitten both by her familial desire to follow me and how she looked. I took a photo attached it to a photo of my own dog Poppy and wrote a message to my two daughters in Australia, 'I found Poppy's South American cousin' (Figs. 6.1 and 6.2).

Fig. 6.1 Street dog, La Paz, Bolivia (Photograph taken by author)

Fig. 6.2 Author's dog Poppy, Sydney, Australia (Photograph taken by author)

Unlike my pampered pet 'Poppy', who shares my bed and house, this street dog of La Paz experiences total freedom and autonomy. This freedom was described to me by many children and adults 'as an ancient and respectful alliance', 'she is free to do as she pleases as long as she doesn't get in the way'. She is neither pet, stray or wild—she is loosely connected to a family, coming and going, sometimes wandering into the crowded family yard but mainly living on the streets. Because she may or may not have attentive carers, she can go hungry, be abused or left to die in the streets if she gets sick. Maybe I would have classified her as a *community* dog. I am familiar with this idea of community dogs from my travels in Asia, Africa and even in our own indigenous communities. I have come across dogs in communities where for thousands of years, they have been well-regarded as a friend, guardian and protector of humans. In Australia, for instance, there had been media discussions about the role of camp

dogs in indigenous communities and how the health and well-being of the dogs were viewed as inextricably connected with the health of the humans. The street dogs of La Paz are urban scavengers, not Western-style, house-dwelling, middle-class 'family pets' who, as I came to realize through my research, spent long periods of time on the streets, seeking out children as their companions.

The population of dogs worldwide may be as high as 500 million. Cultural differences in views of dog ownership and the role of dogs in society influence the prevalence of dogs, the condition of free-roaming dogs and dog-control policies. In some developing countries, dogs are revered. In Bali, for example, dogs, like in Bolivia, are an important part of mythology, are treated with reverence and are given ceremonial food offerings. Children and dogs can relate to each other in a variety of ways. Unlike a Western-centric theorizing of human–dog relations which often see the dog presented as a substitute dependent child—humans finding solace in the seemingly unconditional love from their dogs—the child–dog relations and 'being together' in La Paz are more likened to Donna Haraway's (2015) notion of 'making kin'. The purpose of, or to make, 'kin' according to Haraway is to recognize the coming together of different entities who may not be tied purely by ancestry or genealogy. She argues that the stretch and re-composition of kin represent the understanding that earthlings are all kin in the deepest sense—kin become the purest of entities in assemblages of the human, more-than-human, other than human and by the fact that 'it is past time to practice better care of kinds-as-assemblages' (Haraway 2015, p. 162). Kin relationships emerge in this study as a deep sensitivity by the children when describing the similarities/difference of a shared child–dog assemblage.

'Animals are a compelling part of the human experience of the natural world,' states Myers and Saunders (2002: 153); they are responsive to human intra-actions and often provide opportunities for deep relations between humans and non-human, that is dynamic, personal, emotional and adaptive. They remind us that we are embroiled in the awkward vulnerabilities of living on the planet with other beings, sharing life and death relations. Donna Haraway (2003), in *The Companion Species Manifesto*, argues that co-evolution should be defined in broader terms than a visible morphological transformation of species. She argues, to describe the adaptive transformations of dog species, for example, as a *biological* response to human communities and transformations in human species as a *cultural* or

purely inter-human development is a mistake. 'At the least,' she writes, 'I suspect that human genomes contain a considerable molecular record of the pathogens of their companion species, including dogs' (2003: 31). Dogs in La Paz wait on the streets for children.

Children in La Paz only go to school for three hours in the morning. After this time, they make their way back into the neighbourhoods, where dogs and child co-exist in the streets, in the steep gorges, among the dirt, dust, rubbish, looking for food—escaping the risk often associated with being visible on the streets. The chapter focuses on the photographs taken by children when asked to take disposable cameras with them throughout their journeys in and around their homes and neighbourhood. The activity was organised in order to reveal closely the 'everydayness' of children living in the community. When the photographs came back, I was quite taken aback by the enormity of focus on dogs. Children had taken over 200 photographs of dogs, amounting to around one quarter of the photographs taken. When pouring over these photographs, I could begin to see that the child–dog intra-action was a curious practice central to them being in the community. At first viewing, the children's photographs represented an 'intra-species' relation that was more akin to a 'friendship' than ownership or the dog as merely a 'pet'. Being a child with dogs in La Paz illustrated the complexity of entanglements, yet unlike how Tipper (2011) and Marrow (1998) describe children embedding animals in webs of kin–pet relationships as literally 'part of the family', the child–dog La Paz encounters revealed child–dog inhabiting intimate relations not afforded to human adults.

Ecological Posthumanist Dog–Child Narratives

Regina-Fernanado

> 'This is my photograph of my dog', says Fernando, 11 years from Munaypata, as he hands me two photographs of the same dog sitting in the sun: 'My little dog, Regina is the only animal that I have, because she is my best friend and keeps me company when I am alone. We play in the forest together. I don't really talk about her to anyone. I don't need to – I know she is there. Sometimes she is angry with me. She is hungry and jumps trying to get food. It's scary I think she might bite me. I seen her bite other dogs and once she bit a kid at the park. I ran away fast so she would follow. I was scared. They get into big fights. The dogs. I lay in my bed at night and hear the dogs fighting. I think will Regina be ok? Will she be waiting for me tomorrow? Because I would miss her if she didn't come. I try and find food so that will make her stay'.

Fig. 6.3 My little dogs (Photograph taken by Fernando, 11 years, Munaypata)

By using a new materialist approach, the theorizing of these child–dog encounters becomes embedded in an 'intricate web of interrelations that mark the contemporary subjects' relationship to their multiple ecologies, the natural, the social, the physic' (Braidotti 2013, p. 98). A feature of this new ontological perspective is that 'it shifts from conceptions of objects and bodies as occupying distinct and delimited spaces, and instead sees human bodies and all other material, social and abstract entities as relational' and that these 'assemblages of relations develop in unpredictable ways' (Fox and Alldred 2014, p. 3) (Fig. 6.3).

Black-Ricardo

> 'My dog's name is Black,' says Ricardo, aged 10, from Cotahuma. 'He is beautiful and every time I bath him he gets dirty again. He comes with me when I play with my friends. I worry for Black because he looks at me sometimes with a sad look and I wonder is he feeling pain or is he unhappy. Does he know how I feel? I wonder these things when I am with him. Does he like being a dog? I imagine sometimes that I am Black, that his body is mine.

> How great it would be to have four legs and run up the hills so fast. He is faster than me. When we go to the forest he always gets there first and he sits and watches me, slowly walking up the slope. It is steep and sometimes dangerous. I feel safer when he is there, you know. I know if I got hurt he would help me. Just like I would help him.' Ricardo dreams of changes to his Cotahuma neighbourhood to make it safer for him and his dog Black. 'The place is poor, the whole area is poor. My new house has cracks, my old house was ill constructed and fell down. I would like more police control because a thief broke into my house and because there were no police he escaped. I would like there to be more sports fields, no dust, and that things were greener so I could play safely with Black [his dog who lives on the street]. Do you have a dog?' As we finish this conversation, Norah walks up to show me her photographs. 'This photo is of my neighbourhood,' she says, 'and that is where my house is, it is big and I live with my dad my mum and my sister. My house has many rooms, my dog lives on the street and takes care of me a lot.' Norah is aged 9, from Tac Gua. She has taken the photograph from the roof of a house with her dog. Ricardo asks her, 'What is your dog's name?' 'I don't know,' she replies. 'He has never told me.' 'Mmm.' Ricardo looks down at her photograph. 'Does he know your name?'

While these comments from Fernando, Ricardo and Norah might seem quite mundane and everyday—bathing a dog, sitting with a street dog on the house roof, naming dogs—I am reminded of Rautio when she suggests 'we as academics and adults consider seriously what takes place in practices that children usually find inherent rewarding and spend considerable time engaging in' (2013a, p.395). Within the stories there is an intimacy of shared relations, multiple subjectivities of child and dog. Taking from the relations as a means of being and knowing, is a comprehension that being in this community is to be in relation with dogs, to know them, to feel them, to smell them, to name them and for dogs to know you, name you, seek you out (Fig. 6.4).

Children and dogs share the non-adult human spaces of the community. The relationship of child–dog in the slums of La Paz creates a unique story of child–dog in 'place', the interconnected nature of humans and non-human revealed as exposing a deep attachment to being with 'other', 'being with self'. 'Being with the world' is how Rautio (2013b, p.448) describes forming a different view of ourselves as humans in relation to non-humans:

Fig. 6.4 My dog's name is Black (Source: Photograph taken by Ricardo)

> it is about realizing that the relation is always already there, and as much influenced by behavior and existence of other co-existing species as it is by our intentional or unintentional actions.

Miriam Giugini discusses the ethical dilemmas of child–chook cohabitation in an early childhood setting and explores similar issues around what it means to be worldly with others (Taylor et al. 2013). Her use of Haraway's concept of 'becoming worldly with' (Haraway 2003, 2008) could provide further possibilities for reading these tricky contributions animals make as material agents cohabiting with children. Giugini writes: 'Relations of use produce mutual benefit in companion species encounters, shifting the focus away from purely human gain. In other words, 'relations of use' keep us situated together, highlighting our differences and our response ability to prompt constant questioning of the asymmetry and distribution of power in our mutual relatings' (Taylor et al. 2013, p. 57). In her study on chooks in the early childhood centre, Giuigini noted that cohabitating in a shared space (as opposed to a human-centred space) provided 'both chooks and children the opportunity to be together in the space and that they would figure out how to live together more ethically' (Taylor et al. 2013, p. 57). The outcome of this grappling of cohabitation; child–chooks like dog–child relations being something other

than being together, but becoming worldly with. This could lead to children considering how to live well with others; and as a diffractive performativity of being with children, chook/dogs/companion-species are also grappling with and responding to being in relation with humans. Within this materialist reading of child–dog encounters in La Paz, children communicate through the photographs and stories the 'fleshy detail' (Tipper 2011), the physicality of the relations, engaged in 'the tactile and embodied reality of knowing animals' (Tipper 2011, p. 153).

Chino-Rosario

> The two photographs from Rosario illustrate the fleshy detail of the child-dog configuration thrown together in worldly ways. The dogs are present and central to both photographs. In *dogs in the streets* there are a group of dogs in the middle of the road. The neighbourhood is empty, which can sometimes create an air of danger, but the dogs are playful and the child is taking photographs. Rosario explains, 'As I walk to school the dogs come with me. They are the same dogs, every day walking with me. My special one her name is Chino. She likes to just be with me the most. I like to be with them. They protect me and I protect them. You know if I get close I can smell their bodies, touch them. I can talk to them they listen. They are my friends, especially Chino.' There is a pause. 'They cannot come in the school though. The teachers get angry when dogs are in the school yard. I think what do they do when I am at school, especially Chino? When I go home sometimes she is waiting. I think how does she know, you know, that I am leaving?'

It confirms the sentiment of the community space as occupied by child–dogs. In Rosario's photograph *on the way to school*, the tail of a dog sticks out from the rubbish dump—I am drawn to the children in the distant—is the child photographer with them or just following behind? The dog–child is connected through the lens, and the story the child is devising about the space confirms a focus on rubbish and garbage as central in child–dog lives. Rosario's is situated with the dogs, revealing what it 'means to live as a child and live as dog' to be sensed and touched by dog bodies in the everyday life of walking to and from school, being in community in La Paz. By attending to the detail and considering how these images are being portrayed through dog, in place with child 'enhance(s) our understanding of children's everyday experience' (Tipper 2011, p. 160) (Figs. 6.5 and 6.6).

Fig. 6.5 Dogs in the streets (Photograph taken by Rosario, aged 12, Munaypata)

Max-Juan

Juan describes his familial connections to his home and landscape through the story of his life with Max, the dog who lives on street close to his house and who has come to develop a strong relationship with. 'This is my house, it is on an incline,' says Juan, aged 11, from Cotahuma. 'It is peaceful where I live, there is not much noise, and we can see a street dog called Max, but we don't have any food for him. My dog which is what I like most is not in my home. There are lots of street dogs. I don't like the dogs breaking things everything gets dirty, there are many dogs. They fight sometimes in the streets. I can hear the crying and I weep for them. I want to bring Max inside warm in my bed, but I am not allowed. My mum and Max are important to me.' Max the street dog illuminates the predicament of a shared poverty – Juan's inability to provide food for the dog whom he likes the most. Whereas, unlike Juan, Diego takes photographs of stray street dogs, the ones who often accompany him as he walks the streets. He hands me one where I can see a dog high up on a roof alone, looking down.

Fig. 6.6 On the way to school (Photograph taken by Rosario, aged 12, Munaypata)

> He explains, 'This photograph is of a dog that I take care of because it doesn't eat. The dogs are badly treated and the people beat them for no reason [pause] a bit like the children [he giggles as he looks at his photograph] sometimes we hide on the rooftops to be off the streets with the dogs.' The other photograph? 'That is the dog that sometimes gets beaten, the streets are dangerous.'

Many children feed street animals; they told me they felt distressed when animals were treated badly by others, normally the adults or strangers in the neighbourhood. Dog–child entities are 'co-present' in the streets, the children and the dogs yielding a shared 'worldly collective' of the street-home-being present, dwelling in this shared place. Street dogs are urban scavengers, not Western-style, house-dwelling, middle-class 'family pets'. Child–dog assemblages are expressed through their intra-action in the streets (Figs. 6.7 and 6.8).

The land is steep, and due to the regularity of landslides and floods, it is dangerous. Rubbish is often dumped here and dogs scavenge while

children climb trees or build huts. Juan's photographs portray child–dog as they journey and move through the in-between from streets to 'wild degraded nature' on the upper reaches of the valley. We sense the intimacy and companionship of child–dog as they explore and roam together from prying adult eyes. This is not a human-contrived nature forest play activity or a family dog on a lead being taken into nature with a child, such as we might find in one of Louv's accounts of his or his children's childhood in middle-class suburbia (2005) (Fig. 6.9).

Fig. 6.7 My dog Max (Source: Photograph taken by Juan)

Fig. 6.8 Dogs hiding on rooftops (Source: Photograph taken by Juan)

Fig. 6.9 Dumped rubbish (Photograph taken by Juan, age 13, Cotahuma)

Coco-Juan

> Coco is his companion. Juan co-inhabits this environment with Coco. On the way up the valley Juan photographs a large dumping area for household rubbish; Coco is rummaging around amongst the rubbish looking to find food. It is a harsh life they share. Survival is dependent on the possibilities of what can found at this degraded sites. In the final photograph he shares with me we come to where Juan-Coco (child-dog) play freely in wild nature. Together they have evaded the confines of the built environment and found refuge. Both photographs Juan show me illustrate something other than an 'idealized' and 'romantic' play place where child-dog encounters of diverse majority world child-nature reconnections are possibly located. 'Coco was my best friend,' says Juan. 'He was near me, always he was near me. He heared me, he was always with me. He understands the things I want. He always comed with me into the forest to play. He was my play mate. He was the same as a human friend, it was no difference between us as friends. He is gone now and I miss him. He was part of me and my life. My heart aches now. Death is all around me now.'

Child–Dog Bodies over Time

I am reading now biological information about dog species in the Americas on the internet. I find a picture of a 'bush dog' that lives in the Bolivian Amazon region. It is said to be the rarest dog in the world. One of few dogs in history that have never been domesticated, and therefore has no shared DNA with the dogs of the valley of La Paz. The Aymara people, like the bush dog, are an ancient people who have occupied Bolivia for somewhere between 800 and 5000 years and have come to be entangled with the Quechuans and their dogs. As they advanced south from Peru, increasing the Inca Empire in the fourteenth century, the Quechuans had with them Peruvian hairless dogs. It is believed 15 per cent of modern Bolivian dogs carry the DNA of this ancient dog, a dog that has links to extinct Asian wolves possibly brought to South America over 12,000 years ago. But the community dogs in the streets of La Paz also tell a different story of a postcolonial world, a changing space-time-mattering. Ninety per cent of dogs in La Paz are linked through DNA to the Spanish conquest. Once countries like Bolivia were colonialized, the gentry who arrived brought with them their gentry companion dogs: spaniels and poodles—the infamous Spanish water dogs. The study of dog gene diversity provides a history of peopling of the new world. My dog at home in Australia is a

cocker spaniel. The dogs of La Paz are her ancient kin. They share a common Spanish ancestry. My dog companion was born on Wergaia, Aboriginal land. The aboriginal people of this country go back at least 1600 generations, arriving 65,000 years ago. Their canine companions, the dingoes arrived just 5000 years ago. As the dingoes became accustomed to the harsh terrain, they slowly spread throughout the country, building a companionship with the Aboriginal people that still exists. Bird writes: 'These creatures were the first nonhumans who answered back, came when called, helped in the hunt, slept with people, and learned to understand some of the vocabulary of human languages' (2011, p. 63). Like the street dogs of La Paz, the human–dog relation in Aboriginal communities is built on the forming of close bonds of mutual care and respect; they are both wild and domestic pets.

These child–dog ecological narratives are complicated, located across three time-space scales. First, I am considering the historical spiritual dimensions and speaking to the co-evolution of companion species, and in the case of dogs, the longest of evolutionary human and non-human animal relations, dating back to at least 15,000 years with the advent of ancient dogs being domesticated. The second is a postcolonial story, the Inca Empire from the North in the fifteenth century and then the Spanish invasion in the sixteenth century. The Spanish brought with them dogs domesticated within the European traditions. The third time-space story is located at the scale of real bodies. As a researcher I grapple to be attentive to the complexity of co-constituted and co-evolutionary histories of inter-species relations while I inhabit the everydayness of child–dog relations: child–dog as companion, kin, guide and protector.

Dogs live within these kin-based family groups that are composed of other dogs and often humans. Bird (2014, no page), describing kinship in animals, writes: 'A standard anthropological definition of kinship is that kin relations are bonds of enduring solidarity based on descent from shared ancestor or formed in order to produce a new generation. These bonds of enduring solidarity are emotionally complex in animals, as indeed they are in humans; amongst all kin groups there is the work of raising the young, and work of dealing with loss. Social animals in kin groups are deeply invested in each other, and so it follows that the loss of a member entails grief – that is, the experience of irreversible loss of those with whom one's own life is entangled is both felt and shared.'

'Being with the world' is how Rautio (2013b) describes forming a different view of ourselves as human in relation to nonhumans: 'it is about realizing that the relation is always already there, and as much influenced by behavior and existence of other co-existing species as it is by our actions' (p. 448). The complexity of the child–dog relations of La Paz challenges me to consider what 'living well together' with a host of species and histories might contribute to a common world. Living well with animals means inhabiting their/our stories to try to reveal the complexity of those kin relationships. The work of theorizing multi-species relations through an ecological posthumanist lens draws me to consider a co-habitation of child–dog bodies as an active history of body connectedness. The story of child–dog relations in La Paz is a cobbling together of 'cross species' conversations that take their inherited histories seriously. They are tied together by genealogy, a history of child–dog as bodies entangled on this land. In my re-reading of child–dog relations in La Paz, I have reoriented and brought together child–dog bodies as a single entity, *naturercultures*, which represents the messiness of daily life located in an ancient knowing of animal kin and a more recent shared postcolonial connectivity. Donna Haraway (2008), describing *naturecultures*, writes:

> The thing about naturecultures is that it assumes humans-animals-cultures are not divided to begin with. We might be one glorious, endless continuity that allows seepage into each other, or that differentiates at points and breaks off abruptly, or swerves together connected but out of everyone's sight over the horizon. I figure we don't really know a whole lot about humans or animals yet, so my research and teaching starts with the premise that we need to wonder, and be curious about what we do know, would like to know, and are afraid to know.

Intra-species Companions

The child–dog accounts of intra-species companionship and survival in urban spaces of La Paz challenge the sanitized boundaries and binaries maintained by Western middle-class sensibilities. The 'unromantic' child–dog relations experienced by impoverished urban dwelling child–dogs in La Paz contradict Western-centric views of humanized urban environments where 'animals' are wild, unwelcome and marginalized. The tension of how a city might be a place that supports and nurtures animal relations (wild and domesticated) is exposed in these stories of children in

Fig. 6.10 Neighbourhood drawing by Karen, 9 years, Munaypata

La Paz, with this story repeated in many cities in low-income nations where the more-than-human world is still located within and connected to the everyday lives of children.

The intra-action between child–dog cohabitation provides a space for mutual reciprocity, care and protection (Fig. 6.10).

Bicho-Karen

> Dog as companion to child, child as companion to dog, child-dog as protector. Karen, who is 9 years old from Munaypata, describes her relationship with Bicho as one where together they assume the role as protector and of being protected: 'I have a dog, his name is Bicho and he takes care of me a lot, he protects me from other dogs, sometimes I protect him.' Describing her neighbourhood drawing, she tells me, 'There are mountains where the sun sets and I like it very much and I finish my homework quickly so I can go and see how it sets. There is a girl that always goes to the park to play also with her dogs. There is a mountain like a ravine and I don't like it because they dump rubbish and it is ugly. In my drawing you can see me doing all the things I do. That writing says My life in La Paz! You can see Bicho too.' She points to the dog at the bottom of her drawing. This comment by Karen alludes to one of the tensions in the neighbourhood, how street-occupying

> dogs and children negotiate risks. Raul tells us he likes only little dogs, big dogs scare him. He likes his cousin's dogs, but like many of the dogs, they like to fight. 'I like little dogs. My cousin has three dogs, sometimes they out they fight, and one is really small and he beats the other two dogs. They are unpredictable like my cousin sometimes. I love him. Sometimes I am scared of him!'

Child–dog lives in La Paz are entangled—freedom, vulnerability, fear, expressed and experienced together through a shared intra-species confluence. Shifting away from the *child* in nature as the only agential body and focusing on the materiality of child bodies and the bodies of other non-human entities as relational assemblages allowed me to consider new imaginings for child–dog relations and to see how they are shaped by the spaces in between. This new imagining is connected to a deepening sense of the possibilities for revealing existing intra-species to compliment constructs such as interdependence and resilience: two key concepts in urban sustainability. Throughout this materialist reading of children and dogs, the accounts communicate the 'fleshy detail' (Tipper 2011), the physicality of the relationships, 'the tactile and embodied reality of knowing animals' (Tipper 2011, p. 153). These pedagogical narratives situated with children and animals attend to the messiness of what it means to be a child in worldly relations with other species. Children's accounts of moving with dogs through dangerous public spaces, and exercising mutual care, companionship and protection in these spaces speak to the way in which 'dog and child bodies are shared bodies'; together, they are 'learning how to be' in this challenging environment. As Smith (2013, p. 35) states:

> When we begin to recognise that humans are not exempt from these relations and that ethics and politics too are modes of patterning involved in ecological appearances, with ecological effects and meanings, and which infuse phenomenal experiences in ways that are much too readily accepted as anthropologically exceptional, then we begin to approach an ecologically posthumanist understanding of community.

Conclusion: Reconsidering Child–Animal Relations

In this chapter, I have continued to consider new ways of thinking and theorizing the research data form La Paz in order to consider how human and Western-centric views of child–dog–nature relations can be disrupted.

Theorizing through a lens that seeks to de-centre the human and disrupt the idyllic view of child in nature, I have revealed that nature/child relations are messy and complex, rather than simply restorative and idealistic. In the process I am not attempting to disregard the writings of children and animal relations in cities but merely challenge the simplicity of slogans that potentially support anthropocentrism and the exceptionalism of humans (animals exists solely as a restorative 'resource' for un-natured, disconnected children). Rather than understanding my research as articulated from the modernists divides of human/culture, subject/object, child/nature, I have sought to disrupt these familiar patterns and distance my analysis from the dominance of the human subject in order to notice new imaginings for a child–dog body assemblage of multi-species companions.

This chapter explores through a posthumanist approach to theorizing child–animal relations while also considering a number of the limitations and challenges framing the current child in nature research as discussed in Chap. 4. Firstly, by illuminating child–dog encounters as a 'collective encounters', it is possible to see how studies using posthumanist and materialist approaches can extend Taylor's (2013) adaption of Latour's 'common worlds' notion and advance an indivisible human and non-human real-world collective. That is, rather than a child engaging with animals (outside of the collective animal group), it could be helpful to adopt the view the 'natureculture collective are largely integral to and constitutive of children's lives' (Taylor 2013, p. 119). Secondly, the objects or 'things' of our research studies with children in places are animated. Dogs, earth, houses, neighbourhoods and trees have agency just like humans, and the child–dog–place engagement in La Paz is an example of this reciprocal animated exchange. Finally, the children's accounts of intra-species companionship and survival in La Paz challenge the Western middle-class sensibilities of an idealized child–nature encounter as also explored in Chap. 4. In that way, the posthumanist theorizing of child–dog provides a counter-narrative to the privileged, nostalgic, sanitized Western notions of cherished child–animal–place relations.

Together, these investigations are strengthening the possibilities for imagining a posthumanist ecological community where humans are no longer exempt from the ethical and moral implications of our actions on those entities we share the planet with. 'The posthumanist inclusion of human activities with/in ecology', states Smith (2013, p. 27), 'is not an attempt to naturalise them, reducing them to just a matter of biology, but nor does it seek to separate certain (social and cultural) fields of human

action as being entirely set apart from, or superior to, those characterising all other species (that is, it seeks to weaken exceptionalism).' It is not to elevate dogs to the status of child or de-elevate child to status of dog; it is to view child–dog bodies as inseparable, as bodies and species in a common world. Through the distinct foray of this posthumanist landscape, children are no longer existing without being in relation with dogs. At a time when we are all deeply implicated in the extinction of many of our companion species in the Anthropocene, the unsettling child–dog body of La Paz demands new ways of viewing and acknowledging animal relations.

My ongoing fascination for how Bolivia will consider its role of supporting new ways of considering these relations with animal as reflected in the new legislation on the Rights of Mother Nature continues in my research with children and their everyday life in La Paz. The legislation which is based on broader principles of living in harmony with the Earth and prioritizing the 'collective good' has at its heart an understanding that the Earth and all that live on the earth are sacred. This arises from the indigenous Andean worldview of 'Pachamama' (meaning Mother Earth) that states all entities/beings are living beings. The initial act outlining the rights that was passed by Bolivia's national congress in December 2010 has paved the way for the full legislative framework for defining Mother Earth as a dynamic and indivisible community of all living systems and living organisms, interrelated, interdependent and complementary, which a shared a common destiny. 'Living Well Together' (the mantra of the current government) within this context means adopting forms of consumption, behaviour and conduct that are not degrading to nature. It requires an ethical and spiritual relationship with life. Living well proposes the complete fulfilment of life and collective happiness for all beings. Dogs are remarkable animals because they are uniquely sensitive to the cultural attributes of the humans with whom they share lives. Not only are dogs a product of culture, but they also participate in the cultures of humans. In fact, dogs were the first animals to take up residence with people and the only animals found in human societies all over the world. Because of their ubiquity across cultural boundaries, dogs have been so commonplace that the human–dog history has often been neglected. And yet for the past 12,000 years, dogs have played an integral part in human lives.

Dingoes, like many wild dogs, are an endangered species. They speak to us humans, of the place where death and dying of 'animals' is commonplace. They speak to us of our neglect, our lack of reciprocity for and with those we are in kin relations with.

> Those species of dog especially who must grapple with the threat of extinction might be seen as simply going before us, reaching a space humanity may enter soon enough, and so they speak from a place we have not yet learned to find a voice for. (Poet Peter Boyle, cited by Bird 2011, p. 107)

According to Smith (2013), the posthumanist perspective takes seriously the need to stop 'the anthropological machine, the constant production of absolute dividing lines between humans and the rest of the natural world' (p. 24). Recognizing the fragility of limiting a collapse between the categories of nature and culture is to recognize the means through which exceptionalism as a human condition continues to act out in the everyday lives of being with other species, and the ethical decisions humans make when positioning themselves as superior to all living things.

'The sense of the world is the touching of bodies each against the other, a touching sensed ecologically in different ways by different beings and different species of beings' (Smith 2013, p. 31). Being in the world with others, in ecological community with the animals we share the world with, is to be touched by them. So, as Derrida argues (cited in Smith 2013, p. 31), there is a sense in which

> touching is not a sense, at least not one sense amongst others. A finite living being can live and survive without any other sense; and this occurs with a host of animals that have no vision (it is possible to be sensitive to light without "seeing"), no hearing (it is possible to be sensitive to sound waves without "hearing"), no taste or sense of smell … But no living being in the world can survive for an instant without touching, which is to say without being touched … for a finite being, before and beyond any concept of "sensibility," touching means "being in the world." There is no world without touching.

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CHAPTER 7

Pollution: Porosity of Bodies

Precarity flourishes as the frequency, uncertainty and unpredictability of planetary disasters such as waste and nuclear contamination continue to rise and become pressing consequences of the Anthropocene. Images of a post-apocalyptic landscape have filled our popular culture for centuries; popular culture is closing in during the Anthropocene. Timothy Morton reminds us in his book *Hyperobjects: Philosophy and Ecology after the End of the World*, 'There is no escape from the viscous hyperobjects of the Anthropocene' (2013, p. 29).

Over 50 years ago, Rachel Carson warned us about the dangerous waste and chemicals that were causing harm to all living beings. Asleep at the wheel, while corporations metastasized into behemoths with personhood, it seems we as a global community ignored that clarion call. Decades later, with corporate profits often the key focus of government, the well-being of the planet still seems to be of little concern to most. In this chapter, I explore porosity, entangled porous bodies and how the blurred boundaries between entities, objects and things mean living in messy relations with all things in a spatial, physical and temporal sense.

'A polluted environment is a deadly one – particularly for young children,' said Margaret Chan, World Health Organization (WHO) Director-General: 'Their developing organs and immune systems, and smaller bodies and airways, make them especially vulnerable to dirty air and water' (WHO Report, 6 March 2017). According to the report, women who come in contact with unsafe environmental conditions during

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pregnancy also have a greater likelihood of delivering premature babies or babies with congenital conditions that may strike them in later life. The recent report on the impact of environmental pollutants on children's bodies found that across the globe and particularly in large major cities, 270,000 children die within their first month of life from exposure to preventable environmental risks such as unsafe air and water (WHO 2017). The report also identifies that the temperatures and levels of carbon dioxide are rising due to climate change, which favours pollen growth and increases indoor and outdoor air pollution, which, in turn, is associated with increased rates of asthma in children. Worldwide, up to 14 per cent of children aged 5 years and older currently report asthma symptoms and close to half of these are related to environmental exposures. Overall, the WHO report identifies that the polluted environment humans have created, whether indirectly due to ongoing build-up of toxins from waste and poisons (chemicals, such as fluoride, lead and mercury pesticides, persistent organic pollutants, and others in manufactured goods, eventually find their way into the food chain) in the environment, the impact of natural disasters such as earthquakes and volcanic activity or human-made disasters such as nuclear catastrophes, oil spills and industrial emissions, is placing a heavy toll on the most vulnerable humans in our communities: children and the elderly. Additionally, the impacts of these toxins on our plants and wildlife (especially land and water-borne animals), are seldom counted. With limited mobility like children, they are also unable to reduce their exposure.

Porous bodies are not limited to human bodies, it is the porous bodies of water, soil, air and animals, organic and inorganic that make up our cities. This chapter presents a posthumanist narrative of nuclear radiation (as monstrous porous bodies) to explore the concept of the porosity and the entangled matter of bodies at risk on the planet. By exploring the materiality of radiation through techniques of diffraction, I consider bodies and the planet as an assemblage of non-human matter, an ecological community—invisible monstrous bodies of matter entangled in human and non-humans at the Semipalatinsk Nuclear Test site—and then explore Fukushima as an 'un-world'. I seek through this research to expose the fragility and porosity of all matter and objects that are in relation to each other in this place. The genealogy of bodies therefore is composed of our amorphous engagement with the ecosystem that makes up our planet.

Entangled Matter in Semey

In 2014, I travelled the 7000-plus kilometres by plane from Sydney to Astana (the capital of Kazakhstan), then on to Uste Kamenogorsk in the East Karangada region. I then proceeded to travel 400 kilometres across the Steppes to Semipalatinsk in an old Russian taxi. My driver didn't speak any English; I spoke just a few words of Russian. The road was gravel and not very wide. Every time a large Soviet truck passed us, the driver would swerve off the road onto the embankment. I feared, every time this happened, that my UNICEF colleagues would find my body out here, mangled in the remains of an old 1960s Mercedes with only Russian techno music reaching out in the desolate silence of the Steppe to guide them to me (Fig. 7.1).

Around half way along our journey, the driver pulled over to a dusty gas station to fill up with petrol. I decided to wander inside the small shack on site to see if I could purchase cold water.

After a long history of nuclear testing, the contamination of soil and air in the remote eastern district of Kazakhstan is evident through the seeping invisible radiation crossing porous boundaries and borders.

Fig. 7.1 Taxi drive across the Steppe (Source: Photograph taken from Video by the author)

Radiation is the emission of ray energy in the form of waves. The most penetrating form of nuclear radiation is gamma rays. Radiation waves are invisible and not directly detectable by human senses. As a result of their invisibility, instruments such as Geiger counters are used to detect their presence. Inside the small shack, I encountered for the first time being tested for radiation with a Geiger counter (one of many to come). Radiation consists of several subatomic particles that can lodge themselves on, and in, matter. Gamma rays, neutrons, electrons and alpha particles shoot through space at very high speeds. I understand it is something like 100,000 miles per second. So to put this in perspective, this is the same as my body flying from Semey to Sydney and back seven times every second. It took me three days to get there by plane. When one of these particles goes crashing through materials at such speed, it collides violently with atoms along the way and the delicately balanced economy of the cell is disrupted. The waves can easily penetrate deep inside bodies and this damage can cause fatal cancers to develop or, if it occurs in reproductive cells, can cause genetic defects in later generations of offspring. After the waves of particles are embedded, the cell may die or it may recover only to support the uncontrolled growth of cancer at some time in the future. In the environment, plutonium-239, which is left over on a nuclear site such as the one at Semey, has a 25,000-year half-life (half-life is the time taken for plutonium to reduce to half its original value). I stood nervously sweating as they waved the machinery across my body—no radiation was detected.

During the Cold War, the Soviet Union chose eastern Kazakhstan as a nuclear testing site, because it was one of its remotest, most desolate areas. From 1949 until 1989, Russia conducted 456 secret nuclear tests (116 above ground and the rest underground) at the site with a seemingly unfettered regard for the human and non-human bodies that coexisted there (Keenan 2013). The impact site is 300,000 square kilometres, roughly the size of Germany (Keenan 2013). Over the 40-year period, possibly as many as a million people, multitudes of birds, animals, fish, plants, water, the soil, and the air were deliberately subjected to the impact of radiation exposure. No one was evacuated, nothing was excluded, with 1500 animals and thousands of local villagers placed strategically in the line of the fallout during each test. In 1991, Kazakhstan's newly appointed president Nursultan Nazarbayev closed the site forever (Fig. 7.2).

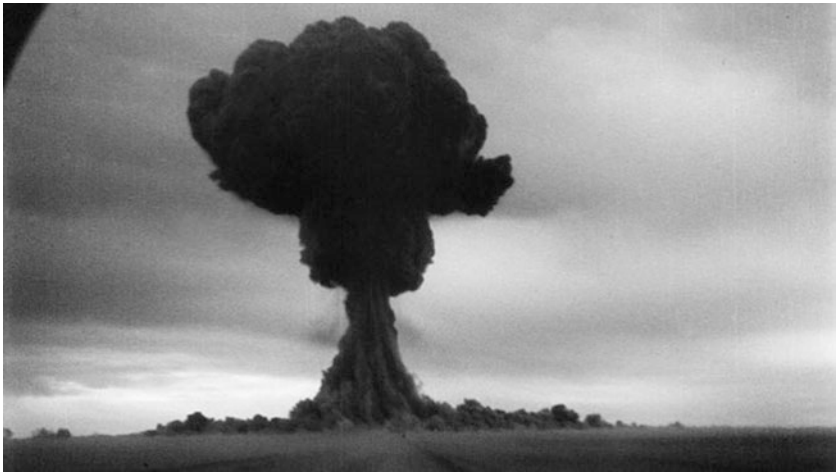

Fig. 7.2 Archive images testing at the Semipalatinsk nuclear test site (Source: http://io9.com/5988266/the-tragic-story-of-the-semipalatinsk-nuclear-test-site)

Bodies as Assemblages

Scientists used to claim that humans were biological islands, entirely capable of regulating their own internal workings. Our bodies made all the enzymes needed for breaking down food and using its nutrients to power and repair our tissues and organs. The specialized cells of our immune system taught themselves how to recognize and attack dangerous microbes (pathogens) while at the same time mostly sparing (though not always) our own tissues. Just as we have come to see we are not exempt from the Anthropocentric impacts we are having on the planetary systems, in recent times researchers have demonstrated that the human body is not such a neatly self-sufficient island after all. It is, like the planet, a complex ecosystem—an assemblage—containing trillions of bacteria and other microorganisms that inhabit our skin, mouth and internal organs (Smith 2015). In fact, most of the cells in the human body, my body, are not human at all. Bacterial cells in the human body, for instance, outnumber human cells ten to one (MacDougall 2012). Haraway (2003) writes:

> I love the fact that human genomes can be found on only about 10 per cent of all the cells that occupy the mundane space I call my body … To be one is always to become with many (pp. 3–4).

Moreover, this mixed community of microbial cells and the genes they contain, collectively known as the microbiome, offers vital help with my basic physiological processes from digestion to growth to self-defence (Ley et al. 2006) and will, when my body 'dies', take over and use what is left to continue on (Haraway 2003). All humans acquire this microbiome, from very early in life (essentially during the birthing process and breast-feeding), even though they do not start out with one: 'Primate fetal development is thought to occur within an intrauterine microbiota-free environment, and yet within a short interval following birth the human microbiome, is colonized' (Aagaard et al. 2012, p. 1). Our microbial profiles can differ enormously. We might share just 10 per cent of our dominant microbial species with other humans (Smith 2015). Each individual acquires their own community from the surrounding environment—our bodies are an assemblage of non-human matter, the genealogy of our amorphous engagement with the ecosystem that makes up our being on and with the planet over our lifetime.

The full impact of radiation exposure at the Semipalatinsk test site was not found out until after the fall of the Soviet Union and Kazakhstan independence in 1991. However, according to government reports, radiation had unleashed a plague on humans, animal, plants, air, soil and water—infiltrating every molecular sphere of the landscape. A 2009 US report stated:

> Cancer rates are high among residents of the villages and cities in the test region. Plutonium, a heavy metal, emits alpha radiation, and the material is most harmful when inhaled or ingested. On the testing site scientists found very high levels of plutonium in horse bones – Kazakh shepherds were using these bones to make soup.

Porous bone soup and bodies of horses are offered to me. I don't eat horse but I have eaten the fish caught in the Pacific Ocean, an ocean shared with Fukushima. My microbiome is layered with exposure to both these ecological communities.

Results from medical screening over the past few years have indicated that weapons-grade plutonium from the atomic bombs has been incorporated into the human and non-human tissues, the cells, of all bodies/objects/things living, dying, and dead in the city. A local doctor told me she had called on the authorities to introduce compulsory genetic passports for humans and dogs whose genes are damaged by radiation exposure, to prevent them from reproducing. Locals told me this was a

violation of rights. When I think about this later on, I wonder how this resonates with my old views of human rights and a new posthumanist ethics. These are not easy issues to reconcile.

Children on Fragility

Atyem lives on the tenth floor of a typical concrete housing block in the neighbourhood. He is 11 years old. He took this photo to show me where he lives; when explaining the photograph, he stated: 'I live on the 10th floor. It is very dusty and dirty. There is no light I would like to go outside but it scares me I might become sick'. I wonder, as he speaks, how can I imagine how it feels to be 'becoming child' with and through radiation? (Fig. 7.3)

One of the questions the educators and I asked the children during the focus groups was: Did they think the air was clean? The majority of children said it was mostly full of pollution, including dirt and cement dust. They told us: 'We would like more grass and trees so we can freshen up the air. The neighbourhood has a cement factory very close by that is constantly pumping bad stuff into the air.' On our walking interview they state: 'Gas pipes and outlets are a real danger. Many are very close to our playgrounds. They leak gas and can cause accidents. The gas is piped into the buildings from here' (Fig. 7.4).

I asked Atyem to draw a place where he would feel safe and not get sick. I watched him as he spent a long time meticulously drawing circles, wondering, 'What were they?' When my UNICEF colleague asked him to describe the picture, he stated:

> This is a backyard of my dream place. The pavement is everywhere to contain the dust. I am drawing mountains in order to show that there is a life behind this fence – a place where the air is clean and there has been no nuclear testing.

The next day I was walking in the main central park in Semey, one of the only parks in the city that is quite well maintained, and came across a section of the walkway that was paved (Fig. 7.5).

Anna also draws a picture of her dream place:

> I love mountains because there is no mountains in our city. I love nature and animals. I would like to walk in the mountains, which would be interesting. I want to take pictures of animals. I would want to explore the underwater world. And I would want to dance because of being happy to be breathing fresh air and away from the pollution from the polygon.

Fig. 7.3 'I live on the tenth floor' (Source: Photograph by Atyem, Semey, Kazakhstan)

The polygon is the name given to the nuclear test site (Fig. 7.6).

During my time in the community, the children take us on a number of walking tours of their neighbourhood to share their experience of the environment. In my diary, I write:

Fig. 7.4 'Dream place' (Source: Drawing by Atyem, Semey, Kazakhstan)

Fig. 7.5 Central park paving, city of Semey (Source: Photograph by the author)

Fig. 7.6 Children taking us on a walking tour of neighbourhood Semey (Source: Photograph by the author)

> The children recognize the fragility of human and non-human life and its link to the contaminated earth. They speak often of the dust, the dirt, the air – the way it infiltrates everything. "There are dead dogs in the streets", they say, "with cancerous tumours."

One of the children says, 'I am afraid of the street dogs on the way home. Dead dogs stink.' 'Deformed babies deformed dogs, Dead dogs dead babies,' says one child. 'Do you know about the nuclear tests?' they ask me as we walk. 'Yes,' I say, 'I did know.' 'It is inside us,' one child remarks, 'it is probably in you now.' During a walking tour of the neighbourhood, Timur takes the following photograph (Fig. 7.7).

Umit, an academic from the Semey University, grew up during Soviet time and said the nuclear tests were never talked about:

> It wasn't allowed to be talked about. It felt like aftershocks of an earthquake – we were never told. I know young people now who are afraid and my friends growing up were afraid but it was not allowed to be discussed and still now it cannot freely be discussed. Not that it isn't allowed, it just isn't.

Fig. 7.7 'Dead dogs stink' (Source: Photograph taken by Timur during our walking tour, Semey, Kazakhstan)

I pause here to consider, how is this different to what I have found out during my time with the children? Davies (2014) notes that careful listening with children can lead to emergent mattering, a way of engaging in community and the world, where 're-configuring that world as a place where self and other matter, and make a difference, to each other and with each other' (p. 12). My listening to the children reveals 'different' understandings of the fragility and porosity of bodies and the making of community.

Monstrous Bodies

> When I found out I was having a baby I told my mother – I will never forget the look on her face. She went pale and a fear swept over her. "Are you ready for what this means? Do you know what this could mean?" (Conversation with Anya, UNICEF Colleague)

Anya revealed to me that having a baby had, for the first time, really brought home to her the fears of her parents' generation—those who still remember being radiated, the interference of bodies. When we discussed this further, she stated:

> When I had my baby in the late nineties it was it was common knowledge to say half the babies born in Semipalatinsk had some kind of health problem, infant mortality rates had grown five times. In villages at the site, it was said 90 per cent of people have suffered from immune deficiency syndrome, leading to an epidemic of tuberculosis. Children with genetic diseases, leukaemia, infertility, and cancer had become commonplace. The stories said one in every 20 children was born with serious deformities. This was mostly invisible and hidden from the community. Deformed babies either died or were put in institutions.

Keenan (2013) writes:

> According to a 2006 study from the Research Institution for Radiation Biology and Medicine at Hiroshima University, approximately 1.6 million people directly suffered from the tests at Semipalatinsk, and an additional 1.2 million continue to experience the after-effects today.

When interviewed, Dr Boris Gusev in 2014, at the Semipalatinsk Institute of Radiation Medicine, stated:

> Over the last 15 years we have thoroughly analyzed all the material in these sites and in archives. We had made our conclusions it is now safe; this is no more contamination and we published our research, and at the same time we have continued our planned research of the population.

Pause, considering for a moment, looking at me, time is hanging.

> But just now a huge new group has appeared of 250,000–270,000 children who are showing the signs of radiation. These are the children of parents whose parents have been irradiated.

Pause, moment, fidget.

> We thought that everything would go smoothly, that chromosomal damage and genetic effects would be confined to the generation of people who were irradiated and they could not be inherited by future generations.

Pause.

> But it turned out that this was wrong.

Every being in the world is struck by 15,000 particles of radiation every second of their life, 500 billion per year, 40 trillion in a lifetime—every

Fig. 7.8 'Jars of deformed dead bodies' (Source: Dead foetus, congenital anomalies due to atom testing, Semey State Medical Academy. http://didierruef.photoshelter.com/image/I0000ZpdyrbDG7X0)

particle has the potential to cause cancer. Apparently, I can reduce this by living in a wooden house (brick and stone hold radiation) or wearing a lead shield around my head while I sleep—even better if I wear it around during the day. I could stop having X-rays, watching TV, wearing a luminous watch or holding my iPhone close to my head or in my pocket, and flying in planes because high altitude increases exposure to cosmic rays. Apparently, these activities can involve similar radiation exposure as major radiation events such as the detonation of bombs in Kazakhstan or radiation leakage in Fukushima. Nobody is exempt; we are all entangled. My family and friends ask me why I would go to Semey, take the risk and expose my body to the radiation. I could answer with a complicated discussion of ethics and morality, and children here having to live with it yet, whereas I am just passing through. But my answer, while based on my growing understanding of the complexity of radiation, is simple: we are all entangled and implicated in an ecological posthuman community. There is no boundary for radiation, here or there, them or us—we are all fragile, porous beings, becoming exposed to monstrous bodies (Fig. 7.8).

Jars of deformed dead bodies are contained in a local museum (they call this dark tourism). The children of our study tell me they have seen these 'bodies' penetrated by monstrous matter. Like the tumorous dogs, they 'provoke fear but also fascination as their ghostly presence, same but not quite threatens to reposition or dissolve the boundaries of normality'. (Goodley et al. 2015, p. 3)

> 'The killing of "monstrous" babies born with "deformities" has been traced back as far as the time of Aristotle' and 'In more recent times, monstrosity was the justification for the "euthanasia programmes" that systematically killed hundreds of thousands of disabled children'. (Goodley et al. 2015, p. 2)

Fukushima, Fortunate Island or Un-world

> Fukushima, that moment when a singularity ended the world as we know it and made in its wake both an un-world (immonde) as well as the possibility of a new Earth. Of course, the event of Fukushima was anticipated by dystopic Manga comics (think of Tokyo Magnitude 8.0 or Astro Boy/Mighty Atom), by the historical precedents of Hiroshima and Chernobyl, and by capitalism itself, through the economic imperatives that drove nuclear technology, including the construction of the Fukushima site. (Cole et al. 2016, p. 215)

The wind that begins off the coast of Japan also typically travels eastwards across the Pacific Ocean, making its way to the west coast of North America, which is what happened immediately after the Fukushima Daiichi reactor explosions. 'When those radioactive dust clouds turn into rain, the radionuclides become absorbed in the soil and, subsequently, the food chain' (Spector 2012, p. 83). When the 9.0-magnitude earthquake activated a tectonic plate off the northeast coast of Japan, it caused a devastating tsunami. But it was the second significant event on the 11th of March 2011; the subsequent meltdown of the Fukushima nuclear power plant reactor and the leaking of toxic radiation into the air, land and sea water and soil would shock the world and revealed the interconnectedness and fragility of all living things on the planet. Fukushima translates as 'fortunate island' but the region's luck dissolved along with the reactors on that day in March. The subsequent system failure, meltdown and uncontrolled release of large volumes of radiation at the Tokyo Electric Power Corporation's Fukushima Daiichi nuclear complex have become one of the defining events of the Anthropocene.

Nuclear Meltdown

According to many news reports, researchers have found that children living near the 2011 Fukushima nuclear meltdowns are significantly more likely to be diagnosed with thyroid cancer, with diagnoses being made at a rate of up to 50 times that of children living elsewhere in Japan. Most of the 370,000 children in Fukushima prefecture have been given ultrasound check-ups since the meltdowns at the tsunami-ravaged Fukushima Daiichi nuclear plant. Recently released results show that thyroid cancer, like in the city of Semey, is also suspected or confirmed here, with 137 children identified as critical, a number that rose by 25 from a year earlier. Elsewhere, the disease occurs in only about one or two of every million children per year by some estimates (Kageyama 2015). Thyroid gland tissue is highly susceptible to radiation during childhood. According to the Life Span Study cohort, a significant association was found between radiation dose and risk of thyroid cancer for those children exposed to the deadly fluids before they were 19 years old. Irradiation in childhood for benign conditions, as well as therapeutic exposure, increases the ongoing risk of thyroid and many other cancers. Risk is highest for young children and decreases with increased age at the time of exposure. The excess risk can be observed for many years after exposure and is at its highest 15–30 years after a child is exposed. The most dramatic finding after the 1986 Chernobyl incident (said to be the worst nuclear disaster in history) was said to be a large increase in thyroid cancers in young children. With the incidence of cancer increasing over 100-fold, 2000 children were diagnosed with thyroid cancer in the risk areas close to Chernobyl, and in some locations, according to Kageyama (2015), where contamination was at its peak, the numbers were even higher.

The majority of the 370,000 children living in the Fukushima prefecture have undergone regular testing since the nuclear meltdowns, with a study in 2015 finding that 137 of them have either been diagnosed with or are showing signs of having cancer. This is 25 more children than were diagnosed the year after the incident and a vastly different rate from what's seen in the rest of the country, which has an estimated average of one or two in every 1 million children diagnosed each year. Making sense of the relationship between radiation and cancer is precarious: it's scientifically impossible to link an individual cancer case to radiation. Looking harder, with routine check-ups like the one in Fukushima, leads to quicker discovery of tumours, inflating the tallies in a so-called screening effect.

Right after the disaster, the lead doctor brought into Fukushima, Shunichi Yamashita, repeatedly ruled out the possibility of radiation-induced illnesses. According to the government, the thyroid checks were being ordered just to be safe, and the high instances of suspected cases of thyroid cancer are possibly due as much to the high instances of testing as to the radiation. On average, a lot of thyroid nodules or lumps are common in the population but go undetected.

According to one of the emerging studies, a local professor at Okayama University said the latest results from the ultrasound check-ups, which continue to be conducted, raise doubts about the government's view. Thyroid cancer among children is one sickness the medical world has definitively linked to radiation after the 1986 Chernobyl catastrophe. If treated, it is rarely fatal, and early detection is a plus, but patients are on medication for the rest of their lives. An area extending about 20 kilometres (12 miles) from the nuclear plant has been declared an exclusion zone. The borders are constantly being remapped as clean-up of radiated debris and soil continues in an effort to bring as many people back as possible. Decommissioning the damaged nuclear plant is expected to take decades.

Many cities in the affected areas have recommended that children up to two years old not spend more than 15 minutes outside each day, and those aged three to five years should limit their outdoor time to 30 minutes or less. While many limits have been lifted as the years pass, many kindergartens and nursery schools continue to obey them, mostly due to the wishes of worried parents. According to an annual survey by the Fukushima prefecture Board of Education, children in Fukushima weighed more than the national average in virtually every age group. The cause seems to be a lack of exercise and outdoor activity rather than any direct medical conditions connected to the radiation (Hanai 2016).

The playgrounds in the cities near the disaster site are empty and children are encouraged to play inside. Even though Japan has a history of being a country where children's freedom to move freely around the outdoor spaces of cities and towns without adults is viewed as important to children's independence and capacity building, in many cities close to the nuclear site, indoor play centres are booming. In an old supermarket centre in Koriyama city, you can find a large public indoor activity space. The centre supports 600 users and a variety of activities including a jogging track, a playhouse complete with large wet sand box and a large variety of activity-based equipment to support climbing, swinging and jumping. Due to increasing demand, families are limited to 90 minutes per visit.

There is also another facility called 'Smile kids park'. It was constructed in July 2012 to let children play indoors instead of evacuating the Fukushima area. The government reconstruction agency states the facility was aimed to provide the children with the chance to engage in physical play, something they can no longer do outside.

One year after the meltdown at Japan's nuclear power plants in Fukushima, research by *Save the Children Japan* revealed that many children were afraid to play outside and lived in fear of the unseen dangers of radiation. The report 'Fukushima Families' (Save the Children 2012) found that children and parents overwhelmingly spoke of their fear and anxiety around the impact of the nuclear crisis and a lack of reliable information to help them make informed decisions. *Save the Children* spoke to 61 children and parents from Fukushima and compiled their greatest concerns and issues one year after the radiation crisis at the Daiichi nuclear plants. The focus was to understand the situation for children and their parents from Fukushima, including those who have relocated, and those who have stayed in their original homes (Save the Children 2012). One mother from Fukushima who was interviewed by the Save the Children foundation told the researchers that her seven-year-old boy, unlike before the crisis, no longer commented on the beauty of fields or pastures even on TV, instead telling his mother 'that places with grass are dangerous' (Save the Children 2012). Other mothers shared that their children often ask, 'Isn't there any radiation here?' whenever their parents take them to play outside. According to the report, children are upset they are no longer able to play outdoors like they used to before the disaster (Save the Children 2012). The children's parents agreed that this was something their children were missing, and conveyed the fear that the restrictions on children's outdoor activities could have a negative impact on their children's psychological well-being as well as physical development. The report states:

> One mother from Fukushima City, still living there today, shared that her son's grades in physical education at school were below average for that time of year – and says her children travel to school only by car, as she is afraid there of potential exposure to radiation (Save the Children 2012, p. 2).

As nine-year-old Honami explains, 'The worst part wasn't when the tsunami hit, it was after. It takes a long time for things to get better' (Save the Children 2012, p. 5).

Of the parents interviewed, many were deeply worried about the consequences of their children not having opportunities to have a safe place to play outside. Kinoshita and Wolley (2015), discussing their research with children in the contaminated zones, remarked on the concerns parents have about their children:

> The data about radiation levels which the government and media reported for a while after the accident was measured 7m from the ground level, well above the height of adults. Then, it changed to radiation measurements at 1 m above ground level. However, this is a standard which relates to the height of an adult. A small child's body is nearer to the ground than 1m where the radiation is higher and therefore children were not considered separately. Even at a low dose, many were uncertain as to whether children should be allowed or forbidden from outdoor activities. Some parents adopted the defensive measure of restricting their children's outdoor activities to reduce their exposure to radioactivity. However, when outdoor activity is restricted, the development of a child's mind and body may be affected. (Kinoshita and Wolley 2015, p. 54)

In some situations, parents had travelled to remote areas where radiation readings were low in order that their children would have the opportunity to play outside. Many parents also wished they had places close by where they could safely allow children to exercise and play indoors. The biggest concern for many parents was the decision of whether to relocate or to stay in the cities exposed to radiation: 'Parents who had not relocated spoke of their fear that others would accuse them of letting their children continuously be exposed to radiation by staying where they were' (Save the Children 2012, p. 3). They wondered: Had they made the right decision to stay? Kinoshita and Wolley (2015, p. 54) noted in their research: 'Adults worry about health impairments caused by radioactivity and children's growth, growth because of the control on outdoor activities. The parents of small children in Fukushima continue to be faced with this great dilemma.' According to Kinoshita and Wolley (2015, p. 42), there were also concerns by parents and others in the community about how children may act out through play their trauma from the disaster and whether this was good or bad:

> traumatic play can be used as a lens to explore some of the play experiences of children in Japan in the aftermath of the earthquake and tsunami. Traumatic play such as earthquake play and tsunami play were seen in the adventure playgrounds. However, a discussion is still taking place in Japan

as to whether this is a good thing or not, with some victims claiming that the atmosphere should be serious, not playful and others thinking that this might remind children of the stressful events but help to prevent flashbacks and PTSD.

On 27 May 2015, a Japanese citizen in Tochigi prefecture posted on Twitter the pictures of deformed plants in his neighbourhood. The area is Nasushiobara City. The plant is assumed to be a 'Shasta daisy'. Children used to make daisy chains in these neighbourhoods. Like the mutated insects, after Chernobyl these images conjure up monstrous matter. Swiss science artist and illustrator Cornelia Hesse-Honegger produced disturbingly beautiful watercolour paintings after collecting and documenting 'morphologically disturbed' insects in Switzerland and Sweden, in zones which were affected by the fallout blown from Chernobyl and into Europe (Mok 2011). After being criticized by much of the scientific community that the images were not correct and were creating sensationalism, she began to also document insects from areas close to properly functioning nuclear power plants. She found that over 30 per cent of these insects also had some kind of deformity: misshapen wings, feelers, altered pigmentation or tumours at about ten times the normal rate. She believes, 'The mutated bugs [are] like prototypes of a future nature' (Mok 2011, par. 7). Paintings by Cornelia Hesse-Honegger of malformed specimens from Chernobyl nuclear disaster site are found on her website (www.treehugger.com/energy-disasters/paintings-mutated-insects-nuclear-power-cornelia-hesse-honegger.html); these images are haunting and are testament to the porosity of all beings.

Radiation Watch

If you want to check the radiation levels in the city before you let your children out to play, there are 394 monitoring points within city limits close to the exclusion zones. According to an article by Craft (2014), radiation levels in Koriyama in 2014 were about ten times higher than that before the accident, with average yearly exposure to the city being around 2.6 millisieverts (mSv), beyond the 1 mSv recommended for annual exposure, but well within the 20-mSv limit set by the International Commission on Radiological Protection (ICRP). The ICRP says there is no statistically higher cancer risk with exposure levels under 100 mSv (Craft 2014).

Photographs of children being screened for radiation can be found littered throughout the websites; they are daunting. Like my encounters of radiation screening in Kazakhstan, they highlight the shimmering veil of the

porous skin of our bodies and that of the planet. The extent of protection of the white-clad officials brings attention to the child's vulnerability—a mere face mask. I can hear the sound of the Geiger counter as it runs across her small body, like it ran across my body. She must now be used to this, the sound of beeps, unlike me. Children are constantly being monitored; radiation is monitored in the streets, on the animals and on the plants. The volunteer group Safecast was organized in the days after the explosions at Fukushima Daiichi. Its founders first hoped to buy Geiger counters and distribute them to residents in the fallout zone so they could all do their own monitoring, but in the days after the accident, the world's entire supply of Geiger counters sold out. Volunteers then built their own device that they called a bGeigie, which they had strapped to their cars while they drove through Fukushima. The bGeigie takes a radiation reading every five seconds and tags it with the GPS location; that data is used to build the maps that Safecast puts online. Safecast has just revealed that it is working with Japan Post, the country's postal agency, to collect data. Safecast has put bGeigies on the motorbikes used by deliverymen in some Fukushima prefecture towns; as the drivers go about their daily rounds, they are collecting radiation data for the Safecast maps.

Technology set up to monitor and 'manage' the impact of the nuclear disaster on child/human/animal/nature bodies. Yet as Cole et al. (2016, p. 216) identify, post–World War II industries are:

> the reasons for Fukushima's placement are prefaced on the capitalist need for cheap energy to supply Japan's industry — and this fact sets up a double articulation in terms of why Fukushima was built in such a precarious situation, in terms of modelling a new capitalist Japan after World War II, and in the frame of an obliviousness to global environmental effects that the push to a new Japan has created.

Meanwhile, the group Radiation Watch has been developing its technology in parallel, and just published a paper about its progress in building radiation monitors that connect to smartphones. The group's volunteers released their first Pocket Geiger in August 2011, using a cheap PIN photodiode detector to sense radiation, and a smartphone app to pair the radiation data with GPS information. The latest model works with both iPhones and Android phones and takes two minutes to get a dose-rate reading (a considerable improvement on the 20 minutes it took for previous devices).

Fig. 7.9 Indoor play spaces in Kooriyama city (Source: Photograph from Kinoshita and Wolley 2015)

> In Fukushima Prefecture, decontamination work has been ongoing since the disaster and, now, in most municipalities, radiation levels in the air are much reduced. The prefecture has established a strategy to support children's play outdoors, recognizing that they cannot solve the issue of the increasing obesity only by providing indoor playgrounds… Mr. Hiroyuki Yoshino, concerned about the issue of radioactive influence on children, organized the Children and Fukushima Network. He and his colleagues in the network have been sending children from Fukushima to safer, greener places outside of Fukushima. (Kinoshita and Wolley 2015, pp. 55–57)

By May 2014, over 64 indoor playgrounds had been built in the Fukushima prefecture. Around 100–1600 children have been using these facilities every day. The government is aware that this is not adequate, yet the concerns of contamination and exposure to radiation have still caused restrictions on the type of outdoor activities children are involved in. Lurking outside the door, seeping into leaky bodies, radiation waits for children's bodies (Fig. 7.9).

Conclusion: Porosity of Bodies

From my brief reading on the science of measuring radiation, a millisievert is a measure of radiation that is equivalent to the average accumulated amount of background radiation a person would be exposed to over the course of a year. Now, it's going to get a little confusing, but I'll try to be as clear as I can be. A millisievert is also defined as the dose produced by the exposure to 1 milligray (mGy) of radiation. When discussing the risk associated with radiation, you are talking about a combination of mSv and mGy, that is, the exposure and the dose produced by that exposure. When looking at a dose of radiation, then the concern is that it is cumulative: it builds up over time in your body. Cumulative exposure means that the longer you're exposed, the lower the amount of emitted radiation is required before it is going to start to cause issues in your body. This is one of the reasons why city officials tell the community (and especially children) to stay indoors when they are in an area that is contaminated. By staying indoors, the exposure to risk is reduced and, therefore, the dose is also. Ionizing radiation is a known carcinogen to which children are particularly vulnerable (UNSCEAR 2006). Children and the unborn are especially susceptible because of their rapid cell division during physical growth. As it is disturbed, the DNA is most vulnerable to radiation impact while cells divide. Wildlife, abandoned dogs and cats who, due to their size and proximity to the ground, disturb the soil and drink water from the drains and rivers are especially susceptible to minute particles residing in these objects. In some cases, children and animals receive higher doses than adult humans because of their higher intake and accumulation over a longer lifetime. Furthermore, sensitivity to radiation is highest early in life. Although the mechanism of greater susceptibility is not well understood, it is likely to be linked to greater cell division in growing and developing tissues. In addition, a longer expected lifetime, with a resultant increased chance of repeated exposure and accumulated damage, also leads to higher cancer risk for children.

Monstrous bodies of matter co-exist in Semey and Fukushima (and now spread throughout the world); they are all in ecological 'community'. Bound together as a collection of genetically encoded messages and materials, passed on as radiation, they are reproduced in bodies, between bodies, and outside of bodies. The significance of this collection of posthumanist bodies is their potential as a cancerous proliferation of cells, the self-duplicating capacity of earth, bodies, animals and machines to be in

ongoing relation to each other, over time and space. The child/animals/earth/radiation are not inert matter, but a community of entities exchanging through entangled relations cancerous potential. Shaviro (1995) describes this move from a postnuclear model of embodied subjectivity entering into a 'viral' or 'parasitic' mode, as a discerning shift in paradigms. For me, it also raises ontological questions of what being in the world with other bodies entails. Ontology involves not simply the abstract study of the nature of being but also the underlying beliefs about existence that shape our everyday relationships to ourselves, to others and to the world. Ontological commitments in this sense are always entangled with questions of being, becoming with history, and how we articulate the materiality of bodies individually and collectively.

Ecological communities of porous bodies raise questions of intra-action and agency, shared exposure to objects and bodies as an assemblage of shared histories of a place. Yet in my genome I now carry radiation from Semey. I am a porous body with lively matter. Donna Haraway reminds us to consider these close relations when, in her essay in *The Companion Species Manifesto* (2003), she writes, 'I suspect that human genomes contain a considerable molecular record of the pathogens of their companion species, including dogs' (p. 31). To attend to and notice child–dog–earth relations in the streets of Semey is to recognize the porosity of the matter that is being taken up within the bodies of all beings in this ecological community. The phenomenological experience of being dog in Semey is, in all appearances, a shared intra-subjective being of the world, with and through becoming child who is equally exposed to the genomes that have infiltrated all bodies/entities (dirt, air, beings) at a molecular level. Haraway (2003) goes on to note: 'How organisms integrate environmental and genetic information at all levels, from the very small to the very large, determines what they become' (p. 32).

Throughout this theorizing of disaster in the Anthropocene, I am continuing to wrestle with this retrospective analysis of research with children in Semey and Fukushima with the idea of what constitutes data as my past focus on human ethics (human rights) comes into contestation with a newly attentive posthuman ethics. A 'posthuman ethics' that, unlike a deep ecological ethic or humanist ethics, urges me to apply principles of 'diffraction, interdependence and intra-action' into my view of the posthuman. I acknowledge the ties that bind child–earth to multiple 'others' in a web of complex interrelations. That is, humans in my analysis are not the only agentic subject; in this world, I am noticing agency and subjectivity

is spread more widely. Children as 'human' are no longer exempt or exceptional; they are deeply embedded in this shared ecological community.

Children's accounts of being entangled in the monstrous bodies of waste, radiation and historical disaster challenge Western middle-class sensibilities of an idealized child–nature encounter, providing new spaces for considering a retheorizing of the postmodern childhood. Encounters in the new nature movement are often recalled nostalgically with little reference to the diversity of 'childhoods' experienced by children throughout the world. Through posthumanist theorizing of child-contaminated-earth relations in Semey and Fukushima, I bring attention to the importance of 'listening to the voices of children and young people who, for better or worse, will inherit the planet we share' (UNICEF 2015, p. 6).

On Fukushima and the Anthropocene, Cole et al. (2016, p. 226) write 'indeed as Jean-Luc Nancy insists, nature has reached a threshold; *it is nature no more*. The earthquake and tsunami render Fukushima not only a technological catastrophe, but also a social, economic, political, and philosophical earthquake'.

Quoting Jean-Luc Nancy, they write:

> We have, in fact, transformed nature, and we can no longer speak of it. We must attempt to think of a totality in which the distinction between nature and technology is no longer valid and in which, at the same time, a relationship of "this world" to any "other world" is also no longer valid. (cited Cole et al. 2016, pp. 226–227)

On the first anniversary of the Fukushima disaster, Senator Scott Ludlam of Western Australia, speaking at a public forum, highlighted the messy entanglement we all have to disasters such as Fukushima. No country, no human, no object is not implicated. He stated:

> Where did the iodine come from? We know where it came from: uranium from Kakadu and Central South Australia, shipped under humid Darwin skies, refined and loaded into Japanese nuclear reactors; uranium broken in fission reactors into isotopes previously unknown on the planet-caesium 137, iodine 131, strontium 90 and plutonium 29…The Australian government took seven months to disclose that Australian uranium was in each of the reactors at Fukushima-Australian fission products poisoning the ocean, the food chain and the gene pool of Japan's Pacific coast. That is the worst nightmare of all for the Aboriginal elders and campaigners and their supporters, who have dedicated their lives to preventing precisely this kind of horror. (Spector 2012, p. 89)

This chapter highlights the vulnerability of children in cities at times of planetary nuclear disasters as expressed through a realization of the porosity of our ecological entanglement. In a posthuman world like Hayles', she remarks, 'We do not leave our history behind but rather, like snails, carry it around with us in the segmented and enculturated instantiations of our pasts we call our bodies' (2003, p. 137). Children in the Anthropocene carry the material entanglement of their lives on their back, in their biome, in their stories; it is real and inscribed in the appropriation of what it means to cohabitate with 'things' and 'matter' in this new precarious world.

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CHAPTER 8

Climate Change: Monstrosities of Disasters

Bruno Latour (2015) affectionately tells us we should learn to love our 'monsters'. Nothing illustrates this better than how disasters are becoming increasingly central to the everydayness of being beings with the planet. The uncertainties of risk and disaster, is the monster lurking unashamedly in the shadows of children's lives who are growing up in the Anthropocene. The World Health Organization (2017) identified in a recent report the implications of climate change for children:

> Climate change is a global catastrophe. While children from low-income populations living in marginal areas are most susceptible to floods and drought, the effects of ambient air pollution, increased global temperatures, and changing disease vector ranges have the potential to affect everyone. By the time these repercussions are felt, damage to children's environmental health will already be widespread; it is imperative that preventive action be taken immediately to preclude these harms to our children. (WHO 2017, p. xii)

Today as I sit down to write this chapter introduction, it is the 20 April 2016. According to earthquaketrack.com, in the past 24 hours there have been 58 earthquakes, of which 5 have been major events where there have been loss of life and extreme damage. There are also 38 volcanoes erupting around the globe today, which apparently is an extremely large number. Alongside these significant geological events, NASA today released the latest temperature data for the globe. It headlines with 'Scorching

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March temperatures set a global record – for the third straight month this year'. Last year was the hottest year on record. If temperature continues to increase at the current rate, we could reach the global rising temperature threshold of 1.5 degree Celsius this year, the one we are trying to avoid. Coral reefs are bleaching, Greenland has had major melts, the permafrost in Alaska is thawing, sea levels are rising and lakes are drying up. Perhaps numb to the implications, climate change, viewed by many scientists as the world's greatest threat to planetary beings, continues to wreak havoc on the planet.

If, as I have argued throughout the previous chapters, the planet is a complex set of entangled assemblages, then the possibility that intra-actions between the changing global climate, the heating up of the planet and the geosphere could be responsible or at least contributing to geological events such as earthquakes or volcanic eruptions does not seem untenable. According to a newly published book by Bill McGuire (2012) *Waking the Giant*, when significant climate changes happened during the ice age, it caused large ice sheets covering much of the planet to retreat. This retreat resulted in a release of pressure causing the earth's surface to 'bounce back'. This movement of the earth's crust at the time is said to have triggered along pre-existing fault lines increase in volcanic activity and earthquakesThis past link between the melting ice sheets and geological change, according to McGuire (2012), is fairly well documented, but research looking at the contribution of recent climate change to the likelihood of other 'natural disasters' is rather sparse. In 2009, a meeting of scientists at University College London, entitled 'Climate forcing of geological and geomorphological hazard', concluded that since climate change in the past has probably increased some 'geological hazards', it is likely to be contributing to those events in recent times. 'Anthropogenic climate change has the potential to alter the risk of geological and geomorphological hazards through the twenty-first century and beyond' (Liggins et al. 2010, p. 2367).[1]

Exactly 200 years ago, 1816 was known worldwide as 'The Year Without a Summer' because of its dark skies, record snowfalls, frozen rivers and failed crops. 'Frankenstein', a story written at the time by a young Mary Wollstonecraft Shelley, explored the impact of a climate change event and the widespread political and social anxiety. She travelled to Switzerland in order to meet Lord Byron; at their meeting on the shores of Lake Geneva, they were inspired to write. The following two extracts from the poem *Darkness* by Lord Byron set the scene of the time, where a series of weather

events sparked the fears the world was coming to an end. *Darkness* paints a picture of chaos and despair; a precarious time; the bleakest of times; a degradation of humanity; the destruction of everything and the slowing down of time where birds, beasts and nature are depicted as creatures more civilized than humans fighting unheroically for their survival. The poem has been viewed as a prophecy about what would happen if humanity continued with wars, contamination and global warming.

Darkness, composed in July 1816, by Lord Byron[2]

> A fearful hope was all the world contain'd;
> Forests were set on fire--but hour by hour
> They fell and faded--and the crackling trunks
> Extinguish'd with a crash--and all was black. *(Line 18–21)*

> Famine had written Fiend. The world was void,
> The populous and the powerful was a lump,
> Seasonless, herbless, treeless, manless, lifeless—
> A lump of death—a chaos of hard clay *(Line 69–72)*

Climate change at this was a time spawned by a three-year meteorological catastrophe due to Tambora, a volcano in Indonesia, erupting and spreading a blanket of ash all over the world. This vision of a monster (Frankensteins) seductive body becomes a historical repository a ghostly memoir for the terrors of modernity. Inhospitable weather is everywhere in Shelley's book. Thunder, lightning, rain and ice caps of the polar north paint the atmosphere not as scenery but as a foreground: as ecological index of social, political and economic conditions that entangle human and geological time scales. As the ship captain Robert Walton seeks a northwest passage across the polar seas to find the monster immured in the ice, the novel describes the warming to the Artic caused by volcanic sulphate aerosols. Yet sightings of the monstrous dark speck across the vast and irregular ice plains repeatedly interrupt the captain's enthusiasm for the new northern opportunity. The temporal 'affect' of the monster, from this monstrous phenomena emerge questions of how monster bodies come to be, placed, within us, outside of us, entities, objects, bodies entangled in love, loss and desire. They entice us to notice landscapes of entangled bodies and the terrors of progress.

In my own research, the uncertainties of a precarious future are located in a deepening fear of the past. I contemplate, is climate change the Frankenstein monster lurking unashamedly in the shadows of children's

lives in the Anthropocene. This chapter on the disasters of the Anthropocene imagines a speculative materialist view of disasters. Binding together a set of ecological posthumanist assemblages, it seeks to attribute agency to the 'matters' of climate change (greenhouse gases, melting glaciers, floods, raising oceans, warming weather and human technologies).

I will consider the monstrous possibilities of climate change through the apparatus of intra-action and diffraction, as it constitutes a reconfiguring of 'things' and 'objects' in order that they are not structured within a specific space or time but are enacted as agential entities flowing in a space-time continuum (Barad 2007). To illustrate this multitude of 'entities' whose certain efficacy defies human will, what Jane Bennett (2001) names as 'enchanted or vibrant materiality' abounds us. Enchanted materiality as climate change is explored through its entanglement in the genealogy of all things, and by using 'intra-action', I can analyse the messy, heterogeneous relations between children and the aliveness of climate change (Barad 2007). As interdependent entities, they co-emerge through simultaneous activity to come into being as certain kinds of things (monsters) through their encounters. Like Barad (2007), I use the term 'onto-epistemology' to describe 'the study of practices of knowing in being'—as an understanding that is central to the enabling of the intra-acting monster, the monster makes me off the world as it is both my liberator and my nemesis. Onto-epistemology assumes that epistemology and ontology are mutually implicated 'because we are of the world', not standing outside of it. The separation of epistemology from ontology, according to Barad (2003, p. 829), was 'a reverberation of a metaphysics that assumed an inherent difference between subject and object, mind and body, matter and discourse, human and monster'.

Climate Change Monsters

> The monster helps us understand the paradox of "difference" as a ubiquitous but perennially negative preoccupation – Rosi Bradotti (2011)

The celebration of the UN Paris Agreement on climate change in 2015 wasn't about killing the climate change monster; it was just about what size of a monster we (as a human species) can currently handle. The agreement was created to hold temperatures back from the increased 2 °C mark, bringing them to 1.5 °C above postindustrial levels. Many who were present

at the meetings do not think it will be enough to incarcerate the monster. Globally, critical disasters are occurring almost five times as frequently as 40 years ago. Scientists warn increasingly rapid melting of glaciers and ice packs could trigger 'tipping points' with catastrophic consequences. As extreme disaster events occur as temperatures increase, together with water scarcity and air pollution, children and animals will feel the deadliest impacts. While much of the discussion on climate change focuses on rising sea levels, by 2050, a billion humans and at least that many non-human animals could be affected by shortages of fresh water alone. The effects, generally, are likely to be especially serious in urban areas, where a large and increasing proportion of humans/non-humans live. They will be the most at risk from the immediate impact of extreme weather events and will struggle to recover from their ongoing consequences. The urban poor are particularly vulnerable. Droughts, floods, heat waves, challenging living conditions and an increase in malaria and infectious disease take their toll on people of all ages, but the disproportionate burden for children is well documented: over two-thirds of all environmentally related preventable illness is estimated to occur in children.

UNICEF has predicted that 175 million children annually will be affected by disasters triggered by climate change—both extreme weather events and more 'slow-moving disasters' like desertification and rising sea levels. Children born last year will be only 35 years old in 2050, by which time the effects of climate change in the form of an increase in droughts, floods and storms are likely to be more in full effect. Water quantity, for all the planet bodies, is actually more important than its quality in many situations. A lack of easy access to sufficient supplies of clean water leads to a considerably higher incidence of water-washed and water-borne disease for children and animals. Inadequate 'washing by water' of food, floors, streets and surfaces contributes to higher levels of endemic illness in human-nonhuman bodies. Problems related to inadequate water supplies are complicated further due to the impacts of concentrations of water in dams or lakes that cannot be flushed, heat up and spawn more water-borne diseases and pathogens. Due to their shared close encounters with the environment sanitation-related illnesses affect young children and non-human animals similarly. They both want to play, explore and touch the world around them. They live close to its earthly skin. Consequently, they absorb bacteria, pathogens, toxins and other concentrated waste products into their porous bodies.

Studies of disasters in the Anthropocene are often informed by an understanding that while the immediate causes of disasters are often natural phenomena, their consequences are not. Rather, their impact is framed by the social and ecological communities where these disasters come to be known and encountered. Disasters can mean many things to children in cities and can be dependent on their exposure to other things such as poverty, inequality and ecological degradation, over a short or lengthy period of time (Ensor 2008). According to Ensor (2008), there has been a shift away from considering disasters and their impact on children from the actual 'event' and its immediate 'impact' as being an isolated phenomenon to a focus now on the 'ongoing societal and [hu]man-environment relations that prefigure [disasters]' (Hewitt 1983, pp. 24–7). Vulnerability and resilience are central ideas, and the capacity of humans and non-humans, 'to anticipate, cope with, resist, and recover' (Blaikie et al. 1994, p. 9) from the impact of a disaster is important and central to a deeper understanding of the complex ecological system of 'things' and how they are entwined. In other words, disaster vulnerability and/or resilience are socially and ecologically produced, and they are 'associated with underlying social, economic, territorial and political processes operating in specific locales' (Oliver-Smith 2005, p. 1). So how humans and non-human entities come to know, become drawn into and are shaped by a climate change 'event' is central to the means through which disasters come into being.

The science indicates that climate change will increase the frequency of monstrous events. Living in a time of extreme planetary catastrophes including floods, droughts, storms, landslides, heat waves and toxic contamination will have negative consequences for children especially if disaster events occur in quick succession as we saw so vehemently in 2011 when a magnitude-9 earthquake shook northeastern Japan, unleashing a savage tsunami. The effects of the earthquake were felt around the world, from Norway's fjords to Antarctica's ice sheet. The debris from the ensuing tsunami continues even now many years later washing up on North American beaches. Unlike the visible flotsam, seeping invisible nuclear radiation from Fukushima has also slowly being taken up in the genealogy bodies. Globally, critical disasters are occurring almost five times as frequently as 40 years ago. As escalating droughts and flooding degrade food production, children will bear the greatest burden of hunger and malnutrition. As temperatures increase, together with water scarcity and air pollution, children will feel the deadliest impact of water-borne diseases and dangerous

respiratory conditions. As more extreme weather events expand the number of emergencies and humanitarian crises, children will pay the highest price. As the world experiences a steady rise in climate and pollution-driven migration, children's lives and futures will be the most disrupted. UNICEF reports that:

> over half a billion children live in extremely high flood occurrence zones; nearly 160 million live in high or extremely high drought severity zones. While climate change will ultimately impact every child, these children are already in harm's way and face some of the most immediate risks. (UNICEF 2015, p. 8)

Children like my own grandaughter, born at this current time will be teenagers in 2030, by which time the effects of climate change will mean they will be living in precarious damaged landscapes with a host of other beings. In the ten most vulnerable countries, including Bangladesh, India and the Philippines, there are 620 million children under 18 already impacted by climate change, in the short term UNICEF estimates that 25 million more children will suffer malnourishment, with a further 100 million suffering food insecurity. Children are among the 150–200 million people estimated to have to flee their homes because of climate change and will suffer more than adults because of their relative lack of resources and higher vulnerability to disease. UNICEF argues that, although children are more vulnerable to the effects of global warming, they have been largely left out of the debate:

> We are hurtling towards a future where the gains being made for the world's children are threatened and their health, wellbeing, livelihoods and survival are compromised … despite being the least responsible for the causes … We need to listen to them. (Quote from David Bull, UNICEF's UK executive director in Harvey 2013)

Children living in slums or poverty in cities are also the most vulnerable to the consequences of natural disasters and everyday hazards brought on by such conditions as climate change. While there is no concrete scientific evidence on how many of the extreme weather events experienced in recent times are directly due to climate change, it is certain that climate change has been a factor and will continue to be (Bartlett 2008). Communities within cities will need to respond and adapt to these changing conditions, and the needs of children, who will be the most vulnerable to these disasters,

will need to be urgently addressed. These monstrous stories of the impact of climate change on children dont even begin to consider how to forge strategies for living with others in the yet-to-be known future of this planet or the losses and consequences of ravishing of the planet on non-human others. Bartlett (2008, p. 502) explains why children in particular need special attention when facing the challenges of climate change but what of the host of others living and dying that shape our planet?:

> Children especially young children, are in a stage of rapid development and are less equipped on many fronts to deal with deprivation and stress. Their more rapid metabolism, immature organs and nervous systems, developing cognition, limited experience and behavioural characteristics are all at issues here … their exposure to various risks is more likely to have long-term repercussions than with adults.

Fluid Lively Matter: Ebbs and Flows

I begin to ebb and flow, opening up. A trench appears and swallows up an entire apartment block. As liquid soil, I continue on, quiet sometimes but other times I will start to carry the asphalt and large slabs of concrete and slide backwards and forward. Then I gush up out of the depths and onto the empty streets. I am on a temporal state somewhere between a solid to a liquid, liquefaction. Heavy sand and rocks sink, while I, with lighter sand, bubble to the surface. I become a slurry that spreads, often towards the water, again the surface shifts. I have been dwelling for many years under the newly paved road and restored pavements. I came from the sea, as a tsunami I made my way across the land. I begin gushing again, up from the cracks in the ground, flooding the street. On the east side of Honshu, near the Sendai earthquake's epicentre, the ground hasn't settled yet and occupy the spaces, in between what was before and what is becoming now. Vibrations have caused openings, deep down in the Earth's crust. I have separated, it is effectively freeing me up to begin moving and sliding—the rising sea, the melting ice, the heat and the cold, the shifting geological plates, dancing under the oceans.

Children that Survived the Tsunami

> In the case of Togura Primary School and Secondary School in Minami Sanriku Town, children were evacuated from the public evacuation place to climb up the hills and survived. (From the research done in the April 2011 by the author). On the contrary, in the case of Ookawa primary school in Ishinomaki, while 34 children died, tragically 74 children died, because of the teachers' error of

> judgment. Though, some children climbed up the mountain themselves and those who were able to do so survived. (Kinoshita and Woolley 2015, Appendix)

On 11 March 2011, a 9.0 magnitude earthquake ruptured a 500-kilometre-long fault zone off the northeast coast of Japan. It rocked the island country for six full minutes, wreaking devastation that is still six years later being cleaned up, cleared away and paved over. The earthquake was 130 kilometres off the coast of eastern Honshu, Japan, and reached the closest land so rapidly that people had as little as 15 minutes to evacuate before waves thundered in. It occurred at a relatively shallow depth of 32 kilometres. The violent quake shook northeast Honshu and collapsed its coastline by one metre. The thrusting moved Honshu about 2.4 metres eastward. The seismic waves on the Pacific Ocean floor set off tsunami waves travelling at a speed of around 700 kilometres per hour. According to footage, waves between 3 and 38 metres tall pounded the Japanese coastline, destroying towns and villages and flooding areas up to 10 kilometres inland. Tsunami waves also swept east across the Pacific. The earthquake triggered a series of unprecedented disaster events. First, there was the impact of the tsunami as it swept across the coast and destroyed 118,000 buildings, killed over 16,000 people and left thousands injured and/or homeless. According to Isami Kinoshita, a professor from a Tokyo-based university in Chiba speaking at a Child Friendly Cities Conference in Nepal in 2013, many children managed to escape this tremendous disaster due to their training in disaster responses in their risk preparedness education programmes:

> Although Kamaishi was struck by the catastrophic tsunami on March 11, the great majority of the 3,000 primary and middle school students in the city fled to safety and were physically unhurt. Many children decided on their own that it would be risky to take shelter at designated evacuation sites, and instead made a beeline for higher ground to escape the oncoming tsunami. For the last seven years, schools in Kamaishi have taught their students the basics of evacuation by inviting experts in disaster management as advisers to speak to the children. (2013 personal notes from presentation)

The golden rules drilled into the children were ‘Don’t trust assumptions about disasters’ and ‘Put yourself first and flee’. The schools also incorporated content about disasters in each subject. One question in a mathematics class on velocity asked students to think about the speed at which a tsunami would reach the coast. The accumulation of these efforts resulted in the students swiftly evacuating in what has widely been referred to as ‘the miracle of Kamaishi’. Many children came up with ingenious

methods to ensure their survival. In some places, children heard from elderly local people who had experienced massive earthquakes in the past, while others drew anti-disaster maps highlighting vulnerable areas by examining geographical features of their neighbourhood. Due to the disaster training, many children survived where adults didn't. One story my colleague in Tokyo tells me is from an elderly grandma in Sendai. She said her grandson saved her life. As he pleaded with her to leave her home and move up into higher ground, she kept saying she would be fine. 'He would not stop nagging me,' she said. 'In the end I had to go just to keep him quiet. If I had stayed I would have died. My grandson saved my life.' Many parents fearing for their children's safety drove to the schools and child care centres close to the coast to pick children up. Most children had already fled to the mountains. Many parents perished looking for their children.

It is believed five million tonnes of material spilled into the ocean at any one time, on those early days. Any 'thing' washing into the Pacific Ocean that didn't sink straight away was carried by the Kuroshio Current into the North Pacific Subtropical Gyre, an ocean-wide vortex of clockwise currents that appropriates floating trash such as glass, metal, fragments of hard plastic or foamed polystyrene, buckets, crates, flip-flops, a coffee cup, fishing floats and rope, plastic bags and bottles, bottle caps, a toy red pail in the shape of a castle, a syringe, a clothes hanger, a surfboard fin, a felt-tip marker, a boot eerily laced to the top, and a few glass jars, bottles, bulbs and fluorescent tubes.

> "I think it's a whale!" one crewmember says, followed seconds later with, "No, it's a capsized boat". In the late afternoon, 1,587 nautical miles east of Tokyo, we discover the forward half of a crushed fishing boat drifting in the water. Any excitement at finding it is muted by the real possibility that this boat belonged to someone who suffered—and perhaps perished—in the tsunami. (Eriksen 2012, par. 13)

Plastic trash kills sea turtles, seabirds and other aquatic animals; this ecological scourge once it escapes into the wild it is essentially invisible. By the end of Japan's devastating earthquake and resulting tsunami, some five million tonnes of free matter had been washed into the ocean. The Pacific Ocean once teeming with life—turtles, dolphins, sharks and big flurries of feeding birds now has nothing alive to be seen. In its place garbage, astounding multitudes of vital lively trash that proceeds

unacquainted to its beginnings as human inventiveness, a scourge of modernist capitalist economies. The huge tangles of synthetic rope, fishing lines and nets still trailing their wires in the middle of the sea are being caught up by fish. Trash isn't just on the surface, it's all the way down. Plastic is ubiquitous: bottles, bags and every kind of domestic item you can imagine—broken chairs, dustpans, toys and utensils are there floating. A flotsam island some 70 miles long floating around in the Pacific, Tupperware containers which used to hold fresh sushi, plastic bags and boxes, bodies and cars, polluting as it goes, and creating dangerous hazards for all seafaring animals and infrastructure. While much of the debris is broken down in the ocean, a significant amount is swept across the waves and begins washing up on shores of distant lands; it continues unabated. The debris is a regular sight on the beaches of Alaska and down the west coast of North America. It is hard to understand the scale of the problem, the sheer amount of debris, unless you are a whale and your belly is cramped so full of plastic that you are now starving or you are collecting it, bagging it and finding ways to destroy it. Alaska, which has more coastline than any other US state, has been collecting the flotsam since it began arriving in 2011 and is now airlifting it out. The trash like stacks of dirty dishes in a shared student apartment, sits waiting to be cleaned and collected.

Most of the washed-up debris is stable: neither radioactive, chemical nor organic. Most of the ocean-junk is similar to the usual pollution that arrives on Alaska's coastlines: fishing nets and buoys, bottles and jugs, and ropes, but now it comes on mass. But there is some unmistakable debris from the 2011 disaster: boats and fragments thereof, chunks of buildings and crates used by Japanese fishermen. The sheer volume of rubbish is overwhelming. This marine debris is not only an eyesore, its liveliness presents a significant danger to marine life, especially those close to shore. Sea otters, sea lions, seals, birds, fish and other animals are tangled in ropes or chunks of plastic, or mistake smaller pieces as food. The next step is to find somewhere to ship the trash. To do that, Alaskans have deployed a huge football-field-sized barge, sailing the coast collecting the bags. Some of the locations are so remote that the collected trash will be airlifted onto the barge by helicopters. For years after the Fukushima earthquake and tsunami in Japan, Alaskan's (human/nonhuman) deal with the commingling and entangled mess of lively 'things' washing up on their shores.

Preparing for Disaster

Suddenly, the ground begins to shake. In Japan, where there are lots of earthquakes, disaster prevention training takes place every year in schools, offices and local communities throughout the country. Children throughout Japan grow up practising drills and making up disaster safety maps as part of their classes in school. Students do research to find out where the local evacuation areas and danger spots are, and then use this information to create maps of their local area. These maps show things like walls that might fall down in an earthquake and the addresses of people who might need special help in an emergency, such as old or disabled people. At the Children's Disaster Training College run by Yokosuka City, children work on their disaster safety maps. The kids walk around their local area entering things that draw their attention onto their maps. Computer programmes and games are another way of teaching students important lessons about planning for a disaster. All these activities are based on lessons learned from real earthquakes. Taking part in these training exercises helps kids to imagine what things might be like in a real emergency and what the best response would be to ensure you are best prepared. 'Blanket Stretcher Time Trial' is an activity where children roll up blankets to make a stretcher, and then use the stretcher to carry a pretend person out of danger. The idea of using everyday items like blankets comes from previous experiences in real-life earthquake situations, when there have sometimes not been enough stretchers available. Another drill is the 'Fire Extinguisher Target Game' where children spray fire extinguishers at a spinning target and try to flip it over.

Since the Great East Japan Earthquake of March 2011, Save the Children Japan (SCJ) has been supporting after-school care programmes (Gakudos), which are one of the places where children can stay after school. By July 2013, SCJ had distributed child-friendly disaster preparedness kits to 7571 children at 218 Gakudos and child welfare institutions in 28 different cities and towns in Iwate, Miyagi and Fukushima prefectures. These kits contain emergency evacuation backpacks, disaster prevention hoods to be worn during earthquake evacuations to prevent head injuries and first aid kits. SCJ, with Plus Arts, a Japanese NGO, developed disaster reduction training programmes to support the materials for children. These new disaster preparedness education materials are based on lessons

learned from the Great East Japan Earthquake. SCJ has been implementing disaster preparedness training with children at Gakudos (after-school programmes). During the training activities, staff tell children many stories of the Great East Japan Earthquake and the ways they had overcome the impacts of the disasters.

According to Kinoshita and Wolley (2015), 'disaster risk reduction can be improved by the daily play activities of children which allow them to know their local environment and to develop their risk management capability' (p. 40). Children's skill in evacuation often depended on their knowledge and experience in their local area. This knowing was attributed to the freedom children had in moving around their city spaces, mostly when they were travelling to and from school and during their play. This was further enhanced by evacuation training they may have had. In Japan, there is a famous story known as the 'Miracle of Kamaishi' (Katada 2012). This story reveals that because of diligent training in tsunami evacuation drills by over 3000 children from elementary and junior high school children of Kamaishi, a small coastal town in Iwate managed to survive the tsunami (Kinoshita & Woolley 2015). A teacher from the school states: 'Many people said it was a miracle, but it wasn't. The response capabilities they learned at school helped them to overcome a disaster that exceeded all worst-case scenarios' (Katada 2011 http://wedge.ismedia.jp/articles/-/1334?page=1). It was reported that for many children survival had been premised on their capacity to climb to higher ground, and this knowledge and familiarity where to find high ground had been due to their daily play regimes.

Gakudos are important places for children to stay after school, and also for parents who work to support their children and rebuild their family's lives in the aftermath of the 2011 earthquake and tsunami. Essential to the distribution of the evacuation packs was to ensure that both adults and children know about the contents of backpacks and how to use the survival supplies so that they can utilize them on their own in case of emergency. Therefore, they have created a child-friendly survival supply instruction guide that is provided with each emergency evacuation backpack. The child-friendly instruction guide is intended for children and Gakudo staff to together learn to how to use each item in the evacuation backpack. To value a commitment to children's perspectives, inside the packs are origami paper and UNO card sets, so even if they find themselves in emergency evacuation centres, children of any gender and age can play together. The items included in the emergency evacuation backpacks,

such as headlights and lanterns, were chosen based on feedback from children and Gakudo staff who had experienced the Great East Japan Earthquake.

In another country not so far away, the young children of Kazakhstan, like those in Japan, also sit in classrooms engaging in disaster risk reduction programmes. To commemorate five years after the disaster in Japan, the BBC runs a story about a football. A football travelled high abreast the ocean waves, settling on the shores of Alaska. On the outside, there is something written in Japanese. Misaki Murakami, 16, lost everything he owned when the tsunami swept away his home in Rikuzentakata. But little more than a year later, on the shores of Middleton Island, Alaska, David and Yumi Baxter find a football. The football had been given to Misaki by classmates when he moved schools several years before. Being Japanese, Ms Baxter was able to translate the name, school and 'good luck' message on the ball, helping to reunite it with its owner. 'I was shocked, as I've yet to recover a single one of my belongings, so I'm really happy about this,' said Misaki on recovering the ball. 'I never could have imagined my football could travel thousands of kilometres and make it all the way to Alaska'.

Drip, Drip, Drip: Dirty Brown Water

Dirty, brown water drips methodologically from an abandoned tap.
Drip …. drip …… drip.

A heavy yellow container dragged along cobblestones by a small child's hand.
Stopping, starting, stopping, starting.
Puddles created, quickly disappear in the warm sun.
Dogs follow.
Licking the ground for wasted drops.
Water bowls once flowing lay empty.
Scarcity overrides reciprocity.
A cloud of dust, dirt follows the yellow container down the street.

At the end of 2016 I was in La Paz again. The city was experiencing its worse drought of 25 years. The children and I walk around the neighbourhood streets. Juan points to a small opening in the hillside where a trickle of water is flowing. 'This is where I bring water down from; it is very dirty and very dangerous. My brother and I are bringing water and it is very far and the container is very heavy,' 'I liked the water fountain,' says

one child, 'I liked it a lot because the water was clean.' But where the fountain streamed and water lapped over edges and played with the children's toes, replenished the birds, it is all but silent. Water bowls left in the streets for non-human companions lay empty. I wonder how will the dogs and pigeons survive? (Fig. 8.1)

When we go back to the centre, Franco draws me a picture of his dream place 'I would like to have a swimming pool to play and get wet. I would like to have fish, ducks, dogs and cats. A water fall to visit by boat. Mountains covered in ice so we can go skiing, and we can have as much water as we want, we need clouds to make it cooler and the sun can always look at me' (Fig. 8.2).

Fig. 8.1 Bringing water down (Source: Photograph by Juan, Cotahuma, La Paz)

Fig. 8.2 Dream drawing by Franco, Tacgua, La Paz

Sixty hours at a time taps are empty. Water ceases to flow. For a 12-hour short period, people and dogs scramble to replenish their supplies. This is the 'dirty water which is what we now have to drink', says a local mother. Due to the water shortage crisis in urban environments fed by water from glacial dams, the Bolivian government declared the country was in a state of emergency. The armed forces distribute water in trucks to the cities. Emergency wells are being drilled. Schools have been closed two weeks early before the summer break. Questions are asked, why hadn't there been a plan? Why haven't those pipelines been built from the rainforest to carry water up the mountain? Why have these lurking monsters been troubling us without fanfare, without science, without technological fixes?

In the mountains beyond the city
A puddle of water shimmers in the sun
Once a dam
Thirsty pipes lie idle
Water drips, dries, gone

In the city streets
The sound of protests, marching, drums, fire crackers.
Scuffles, city officials are taken hostages.
Accusations of corruption.
Rubber bullets ring through the air.
Water cannons spray across the streets to calm the angry crowds.

And while the war on water continues on the streets of La Paz, swarming over the river that once flowed through these streets, it is the sleeping monster of climate change that continues to wreak havoc—climate change as the monstrous in between.

Glaciers all around the world are in retreat. The Andean chain, Greenland, Alaska, Canada, the Himalayas, Central Asia and all tropical glaciers are rapidly melting. These glacial melts are causing a number of disastrous events. First, there is the immediate impact of flood at points where water may have been contained in dams slowly releasing water as the melting occurred. Second, is the long-term impacts to weather as the mountains change density, colour, they release dust, dirt, rocks through weathering and they lack the moisture for producing rain, contributing to the drought conditions down the mountain. The lack of ice melting means water supplies are diminishing changing forever the landscape. Ingold (2010, p. 3) entices us to focus on life processes by attending not to materiality of objects but to the fluxes and flows of materials and matter. The materiality of the glacier, the liveliness of the 'thing' it is both a becoming and a line of flight. What Deleuze and Guattari might explain through the concept of 'haecceity'—thisness.

The glacier
Once a lively viscous
Slow moving river of ice
Snow
Freezing
Snow
Freezing
Recharging its head the mass of mattering ice
Migrated downward at a snail's pace

Time
Heating
Time
Heating

Retreating, dwindling, melted
Water flowed where ice had been
White is the new black
Rocks
Heat
Rocks
Prevail

Climate change presents itself as a monstrous body: photos of polar bears clinging to floating ice caps; waves lapping at buildings; white bleached coral reefs; barren deserted landscapes once home to a community of living beings. Andean glaciers what are known as temperate or tropical glaciers are receding at speeds much more quickly than the rest of the world, due to their high altitude and proximity to the equator. The World Bank has warned that many glaciers in the tropical portion of the Andes are expected to disappear within 20 years. This will threaten the water supplies of nearly 80 million people as well as the future generation of hydropower. Bolivia, Ecuador and Peru depend on hydropower for about half their electricity.

Not far from La Paz, on a mountaintop, sits a building overlooking the city, surrounded by bare rock. The Cerro Chacaltaya, 5395 metres above sea level, once boasted a ski resort, was the highest lift-served skiing resort in the world. You could ski at the altitude at which planes fly. The tow rope, the first in South America, was built in 1939 using an automobile engine, which is now inoperable and dormant. To get to the top of the mountain, you must now hike up the mountainside. Built 3 years afterwards the ski tow rope, and housed in the Mount Chacaltaya laboratory, a weather station was an important site for gamma ray research and gained notoriety in the 1940s as observation site for *pions* (a pion can be thought of as one of the particles that mediate the interaction between a pair of nucleons). Since 2009, the ski lift and restaurant have been closed. The glacier it once relied, which was estimated to be around 18,000 years old and had an area of 0.22 kilometre square in 1940, had been reduced to 0.01 kilometre square by 2007, and by 2009 the glacier had completely disappeared. Ironically, the Chacaltaya GAW Station that was later established in 2011 on the site is a monitoring station for climate changes by tracking meteorological variables, aerosols and greenhouse gases in the atmosphere.

Bolivian's temperate glaciers that provide the water for dams have retreated by 43 per cent in one generation. The melted ice is a major water source for millions. Two of the glaciers that supply water to the capital of La Paz are expected to have completely disappeared by 2030.

When I returned home having experienced the start of the water crisis. I sent a message to my colleagues asking how they and the children in the research communities were coping. My UNICEF colleague emailed me to say:

> We are now in La Paz in emergency of drought, the worst in many years. So you still enjoyed the beauty of water while you were here. Last weekend I was in the street collecting water from a water-truck. (are we a middle income country?)

My colleague from the city council who had a baby in the week I left wrote to me:

> I am as ok as it is possible. About the water issue we have the problem since November 8th but is mainly in the neighbourhoods of east and south of the city and another 300 neigbourhoods in El Alto city. It came overnight. The public department that is the responsible from the national government never informed to us about the problem, that it was coming. Personally I live on the east of the city and we do not have water, they provide water twice a week and just for 3 or 4 hours and once or twice on the weekend a truck came with water and we have to carry it to our homes...is so hard for all the families cause water is essential for everything, if it is not enough the water that they provide to us is dirty no recommended for the consuming just for the bathroom or wash the clothes, terrible. They give as a solution, "just wait for the rains". They do not think people and the thing we are happening is for the political interest of our president Evo Morales who puts in important people in charges who do not have the professional knowledge to assume the tasks that are needed in a better way. Of those three neighbourhoods that you and I worked with, they were not affected by water rationing. Nevertheless, in the zones where the centers were affected the children indicated that for Christmas all they only wanted to have water.

Ironically, for many of the communities on the higher reaches of the valley, the water crisis had little or no impact on their lives. For they live already without city water infrastructure. Their water supplies have always been the small aquifers' and valley streams that run underground only to present themselves as small water sources in the ravines and valleys. The children's photographs reveal many images of the daily shared activities of water gathering and washing in the community of Tacgua (Fig. 8.3).

Fig. 8.3 Washing hung out to dry (Source: Photograph by Luz, female, 12 years old Tacgua)

Leaky Unpredictable Mother Nature

> Agencies are everywhere entangled, and we don't have a political institution at the scale of the phenomena. (Latour 2015, p. 5)

Posthumanist bodies are a complex assemblage of human and non-human, planetary and cosmic particles and waves that require major re-adjustments in our way of thinking. Radiation, water, air, earth, ocean and soil entangled with the human and non-human continue to be represented as leaky, unpredictable Mother Nature. Anthropocene reveals there are many other agencies that are now making a claim for power sharing. The distribution of active agents in any political conversation we have about the entanglement of humans and non-humans is clear, enter the monster. Even though the label and the date may continue to be disputed even after its naming, in terms of political philosophy, its effect is to bring on stage a set of new actors fairly quickly and fairly unexpectedly to respond to the actions of the earlier protagonists, namely the historical agents of history, known as 'humans'.

Climate change is an entangled temporal geology and genealogy of the posthumanist condition. A condition where the materiality of our being is entangled in the diffraction of waves and particles forever seeping and colliding through our shared porous bodies, the earth, water and air. It is a dynamism, like diffraction it is untimely, monstrous, time is out of joint, out of space, it is broken apart, moving in different directions and it is non-contemporaneous with itself. Being and becoming simultaneously. It is never a singular event that happens in a specific space and time; rather it has vitality, it is lively and it is integral to a spacetimemattering that has its roots in deep time and future speculative materialisms (Barad 2014).

For me the monstrosity of the Anthropocene always raises ontological questions of what being in the world, this world, entangled in the Anthropocentric predicament that I find myself in and with other bodies/entities, and the fear, risk, precarity it entails. Onto-epistemology (as emerging from the posthuman materialist turn) invites me to simply explore not only the abstract nature of being but also the underlying beliefs about existence that shape our everyday relationships to ourselves, to others and to the world. It is our knowing and our being. Onto-epistemological commitments in this sense are always entangled with questions of being, and becoming, difference and sameness, how we come to articulate the materiality of these bodies individually and collectively. Natural ecologies with its dichotomous opposition to human/nature binaries are monstrous. Nature as mother shares with the anthropocentric monster the privilege of bringing out a blend of fascination and horror. Mother Nature, the body of a woman as the site and origin of life, also exposes our mortality and death. We are all of mother/nature born, it is both sacred and hellish, and it transgresses the recognizable by prompting new ecologies for speculation—our shared fantasy and nightmare. Through the power of her imagination, Mother Nature can nurture, kill or deform her creation.

Climate change is the monstrous ghost an untimely colliding of our anthropocentric past, present and future, and like Mary Shelley's Frankenstein monster as Mother Nature, it is an 'emergent assemblage with multiple entry points, and multiple, often opposing lines of force' (Davies 2014, pp. 6–7). The monster as an ecology of knowledge is responsible for the paradox of these simultaneous complexities, change-abilities with continuity and flow: Mother Nature, nature as mother, mother as monster, humans as monstrous. The monstrous body, more than object, more than subject, is a vehicle for constructing a web of what Tim Ingold (2010) might call 'enmeshed flows with creative entanglements, these are as the means for recording the fluidity and dynamism of objects and ecological knowledge's'.

In this chapter, I have shared with you my entangled relation with the monster of climate change, it is the *object of my shared aberration and adoration*, yet it is my sameness and difference to the monster that haunts me.

Clocks are ticking
Temperatures are increasing
Glaciers are disappearing
Water is evaporating
Sea levels are rising
A sleeping Monster roars
And yet, outside my window
The sun shines
Birds call, wandering
In and out of sprinkler
Wings flapping with water
Life goes on

Conclusions: Confluence and Contamination

In this work on the impact of disasters on children's lives, I am seeking to imagine a common world of ecological communities that includes all things (human/non-human/non-living). I am through this reading attributing agency to this matter, the 'thing' that is labelled as 'waste' and 'contaminated' matter to acknowledge they (plastic bags, pathogens, brown water, radiation) have a certain efficacy that defies human will, what Jane Bennett (2001) names as 'enchanted materiality'. Enchanted materiality for Bennett (2001) means ascribing agency to such things as the electricity grid, food and trash. The enchanted materiality of pollution in the ocean or invisible electromagnetic fields are always present in us, entangled in the genealogy of my body and bodies of all human and more-than-human bodies in the world. As described in Chap. 7 within and beyond Semey and Fukushima, our porous bodies are seeping and leaking the efficacy of that which we name as the liveliness in material matter.

Diffraction helps me to consider how the waves of rubbish and radiation combine and overlap—spreading until they encounter an obstacle. Bodies as 'ecological communities' are emergent, quoting from Davies (2014): 'emergent assemblages with multiple entry points, and multiple, often opposing lines of force' (pp. 6–7). Posthumanism as a contemporary condition (taking from Braidotti 2013) invites us to think critically and creatively about who and what we are actually in the process of

becoming—the new knowing subject. Posthuman bodies in Kazakhstan, Japan and Bolivia are a complex assemblage of human and non-human, planetary and cosmic particles and waves that require major re-adjustments in our way of thinking. Radiation, air, earth, ocean and soil entangled with the human and non-human continue to be leaky and unpredictable.

In these last two chapters, I have explored the questions of the assemblages of entangled matters co-existing in Semey, Fukushima and La Paz. While the case studies in this chapter explore how children are experiencing major disasters in their everyday lives, mostly as the consequences of historical and present ecological disasters, they provide a window into the future and the ongoing consequences of widespread climate change and the threat it will present for children who will be living on this damaged landscape with ghosts and monsters living and dying. 'There may be no greater growing threat facing the world's children – and their children – than climate change' (UNICEF 2015, p. 7). Bartlett (2008, p. 89) reminds us also of the vulnerability of children also when she wrote:

> There are many vulnerable groups in the context of climate change—the poor, the elderly, pregnant women, and those in locations at particular risk. Children are not unique in this sense. However, they constitute a large percentage of those who are most vulnerable, and the implications, especially for the youngest children, can be long term. If discussion and policy regarding the impacts of climate change fail to take into account the particular vulnerabilities and capacities of children at different ages, measures for prevention and adaptation may prove to be inadequate in critical ways, failing to take advantage of the resource that children represent, as well as resulting in additional stresses for young minds and bodies.

Perhaps numb to the implications of climate change, the invisible build-up of chemicals in our soil, air and sea is viewed by many, including scientists, as the world's greatest threat to the future life of human and the more-than-human beings on this planet. As identified by the Intergovernmental Panel on Climate Change (IPCC), 'climate change exacerbates threats' (United Nations 2014, p. 6), but the threat also exacerbates climate change. For this reason, by simplifying the response to climate change into deliverable outcomes like those identified through the United Nations goals of the global sustainable development agenda is to negate the complexities of our entangled planet. As every crisis, every disaster ravishes the planet due to the impact of climate change, those least powerful and most exploited, such as the children and the non-human, are the most vulnerable.

The confluence of human activities such as nuclear testing with climate change is just beginning to appear in its fullest. On my Facebook feed, a video appears this morning depicting a huge concrete dome on the Marshall Island of Bikini. The dome is filled with plutonium. Bikini Island was the site of 67 bombs detonated by the USA from 1946 to 1958. The radioactive waste with topsoil was collected by the USA and dumped in a crater left by a nuclear explosion and sealed over with cement. Locals call it the tomb. Unfortunately, this tomb which once was at sea level is slowly being submerged by rising sea levels caused by climate change. It is likely to be broken apart and free radioactive particles to leak into the Pacific Ocean.

This chapter should be read in relation to the chapter on porosity. Both tell the story of an entangled past, present and future where the materiality of our being is entangled in the diffraction of waves and particles forever seeping through our porous skin, earth, water and air.

Climate change is the monstrous and untimely colliding of our anthropocentric past, present and future.

> Diffraction is not a singular event that happens in space and time; rather, it is a dynamism that is integral to spacetimemattering. Diffractions are untimely. Time is out of joint; it is diffracted, broken apart in different directions, noncontemporaneous with itself. (Barad 2014, p. 169)

Notes

1. A special issue of the journal *Philosophical Transactions of the Royal Society*, volume 368, issue 1919, was published on 28 May 2010 with 12 articles focusing on the outcomes of the meeting. URL: http://rsta.royalsocietypublishing.org/content/368/1919.toc
2. Extracts taken from the Poetry Foundation website: https://www.poetryfoundation.org/poems-and-poets/poems/detail/43825

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CHAPTER 9

Reconfiguring the Child in the Anthropocene

In the Kino Mountains in central Japan is Lake Suwa. Every year the lake freezes, and due to the changing temperature the ice expands and cracks, pushing upwards and producing a ridge. Japanese legends say this ridge is caused by the feet of Shinto gods as they make their way across the lake. Japanese monks who live in a shrine on the edge of the lake have recorded the passage of the Shinto gods since around 1443, so about 700 years. It is the oldest continuous human recording of climate available in the world. What these recordings reveal is an acceleration in the number of years when the lake did not freeze. For the first 250 years, only three winters the lake did not freeze. Between 1955 and 2004, there were 12 non-freezing events at the lake; between 2005 and 2014, 5 freezing events, and most recently the lake has not frozen in 2015, nor again in 2016. What does this mean Shinto gods do not walk the lake (Nijhuis 2016). Scientists analysing data from the lake have concluded that it reveals an intimate relationship between the timing of the thawing and freezing with the Industrial Revolution. It is a physical; storied account of the entwined realities of ice performativity and global carbon dioxide (CO_2) increases (Sharma et al. 2016). Knotted and tied together the global warming of the atmosphere, caused largely by human activities, is shown to be having an irreversible impact on the climate. These ancient records of the climate provide a direct experience of the environment encountered by the human and non-human inhabitants of the planet over a sustained period of time. These large global climate changes are evidence in many respects of what Tim Morton refers to as 'hyperobjects'. In 2010, Morton

K. Malone, *Children in the Anthropocene*, Palgrave Studies on Children and Development, https://doi.org/10.1057/978-1-137-43091-5_9

(2013, p. 1) adopted the term hyperobject to denote some of the characteristics of the Anthropocene. Hyperobjects are 'so massively distributed in time, space and dimensionality' that they 'defy our perception, let alone our comprehension'. Among the examples Morton gives of hyperobjects are climate change, mass species extinction and radioactive plutonium. 'In one sense [hyperobjects] are abstractions,' he notes, 'in another they are ferociously, catastrophically real' (Morton 2013, p. 1).

'Earth's atmosphere, oceans, rocks, plants and animals are experiencing changes great enough to mark the ending of one epoch and the beginning of another,' writes Davies (2016, p. 4) in the introduction to his book *The Birth of the Anthropocene*:

> The present environmental crisis is epochal in this particular, specialized sense. It is hard to comprehend its magnitude, but if we regard current environmental changes as the birth pangs of a new epoch, and if we give that epoch its place in geological time, in the long history of the earth itself, we might start to make sense of what we are facing.

Robert Macfarlane (2016) has also warned of the implications of the Anthropocene and the consequences of not to seeking to reimagine what it means to be human on a planet that has existed for around 4.5 billion years. On my desk I have a piece of zircon crystal given to me by a my friend Carol; it reminds me daily of the vastness of the earth's history compared to human history, the concept of deep time:

> The idea of the Anthropocene asks hard questions of us. Temporally, it requires that we imagine ourselves inhabitants not just of a human lifetime or generation, but also of "deep time" – the dizzyingly profound eras of Earth history that extend both behind and ahead of the present. Politically, it lays bare some of the complex cross-weaves of vulnerability and culpability that exist between us and other species, as well as between humans now and humans to come. (Robert Macfarlane 2016, *The Guardian*, April 2016: par. 4)

In this book I have attempted to understand the subtleties of Morton's (2013) hyperobjects and to comprehend the magnitude of the epochal crisis that is the marking of a transition to the Anthropocene and how it impacts on the messy, mattered, entangled assemblages of children growing up in cities.

The capacities of children to be open and aware of the fluidity of 'timespacemattering' with and through 'other' beings and objects who

they are intra-acting with, and adapting alongside them in the aftermath of disasters and disastrous situations, are unique. If the United Nations' predictions are correct (Ensor 2008; UNUEHS 2006), that well over 50 million humans, including a large number of children, animals and other non-human entities, who will be displaced by disasters in cities due to the anthropocentric conditions of the present state of the world—and given children and animals in disaster situations are extremely vulnerable and most likely to be traumatized—there is much to do to consider how children can be central to new ways of reconfiguring the universalist of our relations with the planet. Universalist, because the Anthropocene assumes a generalized anthropos, whereby all humans (non-humans) are equally implicated and all equally affected. But we are not all in the Anthropocene together—the poor and the dispossessed, the children and non-human animals are far more in it than others. Privileged humans have cultivated a global landscape of inequality in which they find their advantages multiplied in these highly fragile times of the Anthropocene. The writings of Ensor (2008) on her own research with migrant children after Hurricane Katrina, like my own stories of children in cities in these precarious times of the Anthropocene, are compelling. It is an example of children 'intra-acting' with and through material and relational bodies, of making a difference in the world 'about taking responsibility for the fact our practices matter' (Barad 2007 p.88). Ensor writes:

> [C]hildren play an important part in assessing their own opportunities and responsibilities within their families and societies, even in—or perhaps especially during—times of crisis. Their role in making decisions about their life trajectories and in negotiating difficult circumstances is often much more independent, context-specific, and diverse than generally assumed. (Ensor 2008, p. 296)

Ensor goes on to state that circumstances 'have proven to be far from homogenous, and should not be assumed to be universally maladaptive' (Ensor 2008, p. 295).

Marc Berkoff, in the preface of his book *Rewilding Our Hearts*, writes of humans:

> We humans – big-brained, big footed, overproducing, overconsuming, and invasive mammals – have for a long time acted as if we are the only animals that matter. We have made huge and horrific global messes, impacting every environment, every ecosystem and all species. (Bekoff 2014, p. 3)

In order to change this view of ourselves, as the only animal that matters, Berkoff argues we need to rewild our hearts by restoring the environment: to find harmony in our common goals and our shared call to action. I believe the conceptual interference brought about by naming the Anthropocene is calling us all in different ways to act, to be and respond as Berkoff suggests. It demands of us a response that isn't just about humans once again inserting themselves into the big story of restoration as the hero in the planet's salvation, as many sustainability discourses and policies would have us believe. It is about reconfiguring those old ways and being something different. As Taylor (2013) reminds us that to respond to the big picture challenges of the twenty-first century, children will need:

> relational and collective dispositions, not individualistic ones, to equip them to live within the kind of world they have inherited ...They will need a firm sense of shared belonging and shared responsibility … They will need to build upon a foundational sense of connectivity to this same *natureculture* collective. (Taylor 2013)

Exploring Children's Lives in the Anthropocene

Within a rapidly urbanizing world, many governments, particularly those in developing nations, will struggle to strike a balance between a neoliberal focus for sustainable urbanization and the limits to growth for the planet, compounded by impending global phenomena such as climate change, toxic contamination, waste, species loss and ongoing degradation of the land. Communities of human and non-human others, in low-income nations particularly, will face significant barriers to the current economically driven models of sustainable development and their capacity to adapt. These barriers will come in the shared form of increases in pollutants and pathogens in the air, water, soil and food, natural disasters, loss of land, and the ongoing impacts for human security with insecure slum housing, poor education and health provision. The only way forward may be to rethink our way of being with the planet altogether rather than continuing to tinker around with old models that haven't worked in the past and are unlikely to work in the future. Many of the key issues of the Anthropocene for children were identified over a decade ago as countries embarked on the task of addressing and monitoring their progress to reach the targets through the Millennium Development Goals (MDGs).

But after the 15-year time frame of the MDGs finished in 2015 and urbanization had continued to swell in those countries such as Bolivia, with the least capacity to manage it, children's quality of life is again under the microscope.

Already it is clear that children's rights, their wellbeing and sustainable development are central to the newly launched global post-2015 UN agenda for sustainable development, but will this be enough? (Malone 2015a, b). Investment in children in the past has shown to be a fundamental means to eradicate poverty, boost shared prosperity and enhance intergenerational equity. Investment in children and families has also been shown to be essential for strengthening children's ability to reach their potential as productive, engaged and capable citizens, contributing fully to their societies. The question is how can we equally invest in children's needs and rights, now and in the future, while equally investing in the intra-active potential of a shared set of child–ecological relations with the planet that we can only imagine could be? It is within this growing urgency for possibilities and new ways of thinking on the reconfiguring of child, cities and the non-human as companion kin in a future planet that this book has sought to expose.

Unsettling the Child in the Anthropocene

> As an undeniably powerful, creative and destructive species, humans are both responsible for, and mortally vulnerable to, the life threatening biospheric changes that we have brought upon ourselves and countless other species with whom our lives are entangled. At face value, the omnipotent belief that we are an exceptional species is reconfirmed by the declaration of the Anthropocene. But on the other hand, this same belief in human exceptionalism is self-sabotaging. It leads us to imagine that we can endlessly intervene to 'improve on nature', always find new technofixes to repair the messes we have created, and/or use up the earth's resources without suffering the consequences. It also leads us to disavow our own mortal entanglement in the same earth systems we so radically disturb. In other words, it is the fatally flawed belief in human exceptionalism, in the guise of omnipotence and radical nature/culture separatisms that has unhinged us and produced the imbroglio of disorderings that are now being named the Anthropocene. (Taylor & Pacini-Ketchabaw 2015, p. 510)

Taylor and Pacini-Ketchabaw clearly outline the irony we as a species, amongst others, find ourselves: both as the monster and the maker.

The unsettling that the naming of the Anthropocene has administered—and will continue to administer—is a massive jolt to our collective imagination of ourselves.

> If viewed as a potentially transformative naming event with complex affordances, rather than as a scientific validation to scramble for yet another heroic techno fix, debates over the Anthropocene can open a space for constructive circumspection and thoughtful response. (Instone & Taylor 2015, p. 139)

Philosophically, it is a concept that works both for us and on us. In its unsettlement of the entrenched binaries of modernity (nature and culture; object and subject), and its provocative alienation of familiar anthropocentric scales and times, it opens up a number of possibilities for exploring concepts such as entanglements and differences in children's lives. Barad (2014, p. 176) argues:

> '(d)ifference is not some universal concept for all places and times, but is itself a multiplicity within/of itself. Difference itself is diffracted. Diffraction is a matter of differences at every scale, or rather in the making and remaking of scale, *spacetimematterings*. Each bit of matter, each moment of time, each position in space is a multiplicity, a superposition/entanglement of (seemingly) disparate parts'.

In working with and through diffraction as the entanglement of entities in the Anthropocene, I have sought to highlight and 'make evident the entangled structure of the changing and contingent ontology of the world, including the ontology of knowing' (Barad 2007, p. 73). Entanglements in this sense do not propose unity or erase difference, in fact 'entanglings entail differentiatings, differentiatings entail entanglings. One move – cutting together-apart' (Barad 2014, p. 176).

Entanglements call into question the state of entities and events. It persists in unsettling us to imagine children as no longer existing separately from one another or apart from the many others they are 'intra-acting within and as part of' (Barad 2007, p. 88). The study of entanglement has through diffraction allowed for a form of performativity—'subjects and objects do not pre-exist as such but emerge through intra-actions' (2007, p. 88). This is a challenging work; it is easier to write about it than do it. I know in places I haven't succeeded in doing enough in my theorizing of

the research data to fulfil fully these expectations of Barad's theoretical principles. But I have in the writing attempted to do something different when bringing posthumanism and new materialism into the commons with children, through the concept of ecological posthumanism. I have done this in order to expose the entangled nature of children's lives with the non-human world that embraces them, holds them, works through them and for whom they have come to know, often without the need of formal 'researching possibilities' such as those I created in these projects around the world. I have in this work focused on assemblages of differentiations, by exploring entangled natures, the porosity of bodies, children's multi-species companions, the materiality of mobilities, and the monstrosities of disaster. This ecological posthumanist perspective, building on a view of ecological communities beyond deep ecology or sustainable development, takes seriously the need to stop the anthropological machine and contests the production of absolute dividing lines between humans and other worldly matter. It recognizes the fragility and porosity of all matter and objects—not to collapse categories of objects entirely into each other but to bring to our attention the porousness of what has been viewed as distinct boundaries and distinct entities. I have through this work considered children's lives differently by inviting the monster into the room.

The monster in the room, or what Latour (2015) referred to as the herd of black and white elephants that are stampeding on the stage of the quiet American political landscape, is the Anthropocene. 'What is totally missing from the description of the Anthropocene,' states Latour:

> is that it modifies the scale, the speed, the rhythm and, more importantly, the distribution of active agents in any political conversation we have about the entanglement of humans and non-humans. Even though the label and the date are still disputed, in terms of political philosophy its effect is to bring on stage a set of actors that reacts fairly quickly and fairly unexpectedly to the action of the earlier protagonists, namely the historical agents of history, formerly known as "humans". (2015, p. 5)

While there is much suspicion around how human impact on the planet might play out, it is clear that sustainability has some role to play. Yet I believe it would be politically naïve to imagine the global community will adopt a just and equitable response to the ecological crisis under a banner of sustainable development or geo-ecological management. Throughout this book I address many of the challenges (and limitations)

of 'sustainability' and 'sustainable development' (and its by-products projects like UNICEF's child-friendly cities), as a means for addressing the impending monstrous crisis. Simple (or even complex) sustainability models will fall short of explaining the complexities of messy entangled worlds of the least privileged, child-bodies-objects in cities. The story of sustainability is written as 'if humans were still alone on stage, the only being who out of its own free will is in charge of apportioning space, land, money and value to the old Mother Nature' (Latour 2015, p. 6). By reconfiguring the way we come to be in the world. By reconceiving the notion of the Anthropocene as a means for unifying past ways of knowing that acknowledged the inequities existing in a common world of humans and non-humans, I am considering if a new way forward through an expanding species thinking that acknowledges human and non-human relations as intra-active, agentic and lively. Our entangled history is revealed through the ghosts that remain on our landscape, and our future story is unravelling before our very eyes. This work of reconfiguring the Anthropocene means getting beyond a view of the political as confined to 'humans', instead geophysical forces, the non-living, the human and non-human are all actors contributing to a transition between two epochs. In this transition, 'sustainability' might begin to look like a 'time-bound and contingent goal at best, not an absolute one, so environmentalists will need to construct some other normative standard of value' (Davies 2016, p. 200). The naming of the Anthropocene becomes the way of remaking and reconfiguring connections between humans and non-humans, demoting the old mantra of sustainability (Davies 2016) and considering an ecological collective concerned with difference and diversity instead of sameness. This will be the struggle for a politics and ethics of plural ecologies.

Through a lens of the Anthropocene and by drawing on a variety of tools including Barad's notion of diffraction and intra-action, I have sought to reveal the complexities of an entangled messy world illuminated by listening to children and engaging through children's voices their encounters in and with the world. I have also endeavoured to support Taylor's (2013) adaption of Latour's 'common worlds' notion and advanced an indivisible human and non-human real-world collective through the lives of children. Being and belonging to the precarity of life on this finite planet, I have sought to account for how practices matter in this reading of children in the Anthropocene and most importantly that '(e)xistence is not an individual affair. Individuals do not pre-exist their interactions; rather, individuals emerge through and as part of their entangled intra-relating' (Barad 2007: *preface*). I have brought attention to the

way the environmental crisis accentuates rather than diminishes differences between the rich and the poor, the privileged and the not-so-privileged. It is important not to universalize childhood through an artificial separation of the human–non-human experience. I believe that it is in these stories of the dispossessed, those children living in the global south, post-Soviet countries, Pacific island states where the social and ecological costs of toxic waste, natural disasters, climate change have been widely experienced, we can find some answers to the questions of our shared future. In these communities where spiritual beliefs and ways of knowing have for thousands of years acknowledged the way in which human, non-human and the non-living world co-produce one another. These are the communities often where indigenous peoples, slum dwellers, women, children and youth and some governments have risen up against multinational corporations and have sought to find ways to be in 'good' relations with others. These are where the questions of ethics (embracing ethics as a just, fair childhood conjoined with ecological post-humanist collectivism), epistemology and ontology become devoted attachments, inseparably woven through our deepest concerns. In these ethos-onto-epistemological spaces is where new ideas for being in ecological community with others could evolve, that is, 'the environmentalism of the poor might appropriately become the type of environmentalism most readily associated with the idea of the Anthropocene' (Davies 2016, p. 203).

I finish these stories of *Children in the Anthropocene* by considering 'No species, not even our own arrogant one pretending to be good individuals in so-called Western scripts, acts alone; assemblages of organic species, abiotic actors make history, the evolutionary kind and the other kinds too' (Haraway 2016, p. 99). Childhood in the Anthropocene is premised on import of making kin, 'situatedness' of being child relative to, and co-mingling with 'other' kin. By making evolutionary history. By being sensitive to how children come to know it, sense it, touch it, and be in it, we can acknowledge how it is to be child with a host of others and the potential differences, through diffraction, their 'acting' as an ecological collective can have on the ecosystems of the planet:

> By the mere process of living, organisms change the very conditions upon which they depend for subsistence. Their resource supply is changed by the effects of their own interactions. The individual effects may be small but the compound effects are large. Eventually they change the ecosystem. (Canan 1996, p. 30)

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