On Stories of Liveliness

Following the Arts of Living on a Damaged Karoo Veld

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COMPULSORY DECLARATION

This work has not been previously submitted in whole, or in part, for the award of any degree. It is my own work. Each significant contribution to, and quotation in, this dissertation from the work, or works, of other people has been attributed, and has been cited and referenced.

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ABSTRACT

This thesis is concerned with the conditions of generating a livable Karoo landscape and the arts of living on a damaged Karoo veld. It takes place in a context where the anthropogenic influences on land degradation, desertification and biodiversity loss continues to haunt the Karoo in the present. The Karoo is a semi-arid region that spans the interior of South Africa. It is also region that has been subject to ongoing and widespread concern of the impact of overgrazing, threatening the livability of the Karoo landscape. This is a result of human/nonhuman relations that have been grounded in a colonial mastery of the land, whereby the advent of private property regimes, modernist technologies and capitalist extraction has allowed for the land to be cheapened, exhausted and severely degraded in a process of colonial dispossession. This research is a qualitative ethnography interacting with farmers and nonhumans on rangelands in the Great Karoo. This thesis shows how the earlier degradation of the Karoo has demanded farmers to pay attention to the relationalities between ecology and economy, since their economic/ecological survival depends entirely on the ongoing multispecies assemblages of which humans form a part. Infrastructures and technologies have become grounds for new ontological practices of regenerating the Karoo veld. Infrastructures (namely fencing) and sheep are used in ways that mimic the earlier migration of large herds of antelope. Here, the bodies of sheep are curated and moved in order to perform a particular ordering of a Karoo 'nature'. This movement is believed to instigate multispecies liveliness. Sheep, who were once destroyers of the veld, are now enrolled in practices that are believed to bring back the 'natural' vegetation of the Karoo. The thesis problematises the ongoing Western ways of knowing that separate the world into binaries of 'nature'/'culture', 'human'/'non-human', 'subject'/object', 'domestic'/'wild', 'economy'/'ecology', 'life'/'death'. Rather, it argues that a concern with ontological plurality is a process of paying attention to the mutual ecologies and multiple species that gather in human/nonhuman worlding projects on rangelands in the Karoo.

KEYWORDS: Arid ecologies, multispecies, monsters/ghosts, infrastructures, nonhumans, ontology

For my late grandfather Peter Köster.

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CONTENTS

PROLOGUE

To be of the Karoo

I have known since I was a child that where I come from is the Karoo. Not the Klein Karoo, but the Groot Karoo. Where the koppies[1] slope gently into flattened plateaus, where the bushes are sparse, the soils grey and slippery under my feet and the windmills tower like majestic infrastructures of life above me. I did not grow up in the Karoo, but my parents, and their parents, and their parents' parents all walked there, so I experienced the intergenerational nostalgia for my belonging in the Karoo. As a child, there was a deep admiration of the Karoo bestowed upon me. These admirations were often directed towards the rain, the sweet underground water, and the ancient bossies[2], as my uncle would call them. Yet, as this research process will unfold, I knew almost nothing about the entanglements of living and dying that occur(ed) there.

As children, when we drove up the N1 into the Great Karoo, the monotony of the extending veld would keep us asking: "How long until we get there?" Eventually we would reach one of the many dirt roads that took us to my parents respective family farms. It is on these roads that we would argue whose turn it was to open the next gate. These were the best parts of the journey, because large dirt bumps, resembling speed bumps, would intersect the roads and as our car would pass over them, our stomachs would churn as if we were experiencing the thrill of an amusement park ride. Little did I know that the same gateways we would pass through held, in their wake, the deaths of the multispecies lives that used to make life in the Karoo and that the bumps on the dirt roads were attempts to slow down the water that could easily wash the soil away on the bare and plant-less roads. The big, majestic windmills with the round cement dams collecting water for livestock were the same pools I would swim in with cousins and siblings. At the time, I did not know the wind that drew the sweet water from the aquifers in the earth of the Karoo, carried with it the ghosts of human (and my own ancestors) destruction of the landscape that we loved so much.

When I was a child I saw the dry river basins as places where we could make fires and build houses; not as the remnants of soil washed away. The roots of the trees lining the river basins were now exposed and they could no longer hold the soil and all the life it contained. Moreover, the roots of the

[1] "Koppies" is the Afrikaans term commonly used to describe flat-topped hills in the Karoo.
[2] "Bossies" is the Afrikaans term for "bushes".

trees were no longer sheltered and enlivened by the soils that allowed them to establish there to begin with. I never noticed how the sheep paths we used to follow that weaved through the veld and along the koppies, plant-less from the repetitive movements of sheep, were potential causeways for more rivers of erosion. Nor did I see the sparse bushes as sad examples of potential biodiversity loss. The bushes themselves were not the problem, but a landscape that contained *only* those bushes was, both for economic and ecological reasons. I hardly ever saw grass and I did not know I could or should see grass in the Karoo.

Anna Tsing (2012) has suggested that "familiar places are the beginning of appreciation of multi-species interactions" (2012:142). This thesis considers the multiple and multispecies stories present on and in the Karoo landscape. As much as this research project is about uncovering the multiple ontological entanglements that gather in the arts of living on a damaged Karoo landscape, it is also a research project that is concerned with my own historical ghosts that continue to inhabit the Karoo. This research is therefore instigated by a seventh generation (mother) and fourth generation (father) Karoo child whose intergenerational responsibility for colonial mastery and extraction of the Karoo landscape is present in, on and through this work. The farming of livestock in the Karoo has been a part of my colonial history, and thus the degradation, desertification and dispossession is part of my history too. Whilst I do not intend to pursue and further contribute to this legacy of human exceptionalism, I do intend on uncovering the ways in which this history is the ground for reconstituting the entanglements between humans and nonhumans. Therefore, this research project intends to look at the histories that haunt the present and to uncover what kind of futures are being imagined for the Karoo. Part of this is about tracing the ways in which living on Earth, in this moment of the Anthropocene, are tied to ecosystems' revival and land reconstitution.

CHAPTER 1

The Stuff of Survival: Looking to the Past to See the Present More Clearly

Introduction

This thesis is concerned with the conditions of generating a Karoo liveliness on land that has been severely exhausted, cheapened and degraded. I wish to tell a story that bears witness to the ways in which the earlier degradation of the Karoo has become grounds for land care practices that pay attention to the multispecies worlding projects that occur in the Karoo. These land care practices, as this research will unfold, trace the ways in which farmers in the Karoo are imagining themselves as participants of a future Karoo liveliness. As such, this research follows everyday worlding projects that accompany the art of living on a damaged Karoo veld and the multispecies entanglements that allow this to happen in a context where life is constantly at stake. It asks: what are the multiple ways in which both humans and their nonhuman counterparts co-create a living Karoo landscape?

This research follows the work of Tsing et al. (2017) and is concerned with their work on the *Arts of Living on a Damaged Planet*. Drawing on the work of Tsing et al. this research understands the Karoo as a "haunted landscape" whereby the winds that give rise to the sweet Karoo water, also carry with them the ghosts of the Anthropocene (2017:G1). The Anthropocene, which in *our* time has inscribed *our* force into the geological narratives that determine earth's livability leads me to ask: Which are the ghosts that continue to inhabit life, non-life and everything nearby in the Karoo landscape? This era of human destruction, according to Tsing et al., requires us to go back into the past in order to see the present more clearly (2017:G2). It is the return to the "multiple pasts" that this research is concerned with in order to uncover the "ghosts" that continue to haunt the present with past ways of life. Moreover, it is interested in the past and present "monsters" whose "ambivalent entanglements" create the uneven effects of the Anthropocene (Tsing et al., 2017: M2). In the Karoo, ghosts can be seen in the diminished seed stocks that were usually carried, in part, by the coats of antelope across the landscape. However, the extinction of animals or animal phenomena, like the great springbuck treks[3], curtailed the reproduction of plant life and their haunting acts as an ongoing cause of land degradation, soil erosion and desertification. It is the relationships between these "ghosts" that

[3] "Trek" or "Trekbokke" is the Dutch term used to refer to vast herds of migrating antelope, especially springbuck, that would periodically sweep across the interior of Southern Africa (Roche, 2008).

informs the stories of "haunting" and it is the relationship between these that will occupy this research. Moreover, the monstrous entanglements between animals, humans and plants in the Karoo that have left behind typologies of erosion, shows the "layered temporalities of living and dying that shape our landscapes" (Tsing et al., 2017:M10). The figures of monsters and ghosts guide this research into learning about the conditions of livability of the Karoo Anthropocene.

Since the early 20th century there has been widespread concern and ongoing debate about the impact of livestock grazing and thus the extent of human influence on biodiversity loss, land degradation and increased desertification of the Karoo (Acocks, 1953; Archer, 2000; Roche, 2008). Whilst discussions around the extent of anthropogenic environmental degradation in the Karoo is ongoing it is indisputable that the ecological processes of the Karoo have, in part, or in some cases entirely, been disrupted (Roche, 2008:158). These landscape disruptions have been thoroughly informed and layered by a colonial history of mastery and conquest of the Karoo land and the first people who occupied the Karoo. It is the introduction of fencing and windmill technologies that draw water molecules up from the aquifers which run in the fractures deposited in the sediments of the Karoo Supergroup – formed during the Carboniferous, Permian, Triassic and Jurassic ages between 300-120 million years ago – that is believed to have reoriented the Karoo landscape (Botha, 1998:1743). These water molecules allowed farming practices to inflate sheep stocks which in turn provided wool and warmth to Europe during the wars of the mid-nineteenth century. The same water molecules also allowed permanent settlement by colonial intruders, who eventually sanctioned the "wanton destruction of human life" (Green, 2014:4) and animal life that predated their arrival in the Karoo. The cessation of previously nomadic human and nonhuman life arrangements along with the overexposure of plant life to continuously grazing domestic livestock is thought to have disrupted the Karoo ecosystem and its metabolic ways[4]. The permanence of the introduction of round cement dams filled with sweet underground water promised life for some at the expense of others. In the Karoo it is the large patches of lifeless soils, where no plants have established, that point us to the inconsistencies of life. It is these same inconsistencies in vegetation, from farm to farm, and camp to camp, that the farmers in this research inherited and intended to change.

[4] Here, I draw on Marx's theorisation of the "complex, interdependent processes linking human society to nature" what he called the "metabolic interaction between man and earth" (Marx, 1976 in Foster, 1999:379). Using the theory of the "metabolic rift" (Foster,1999:370) I understand the Karoo as an environment where the interconnecting ecological flows are pushed and pulled by socio-political and economic relations, that are in turn, dependent on the same ecological flows that they might have disturbed to sustain life.

As this research will unfold, the role of infrastructural development in the Karoo have been essential in the formation of new systems of production. Infrastructural development expanded organised range management into the semi-arid Karoo, an area which, at the time of the colonial conquest inland, seemed dire. Infrastructures, fences, windmills, and their material configurations were implemented in the Karoo to accommodate colonial desires of maximum production, but they also expanded the colonial frontier into the Karoo whilst quite literally claiming and demarcating land all in the name of progress. Infrastructures and environments, as Hetherington (2019) argues, "share a great deal of conceptual territory" (2019:6). In the Karoo infrastructures are still imbued with the sentiments of progress, territory and making use of nature for economic growth, but they also hold qualities of a certain kind of environmentalism. They are understood both to be part of the story of degrading the Karoo veld, whilst also being part of the story of regenerating the veld. Thus, as this thesis will show, if we wish to understand the Karoo environment we need to understand the ways in which the socio-material and ideological practices are configured in the erection of infrastructures. Then we may begin to see, what other scholars have called to attention in the Anthropocene, that infrastructures and environments are not separate categories, and neither are categories of the social and the natural (Hetherington, 2019:2).

The changes in the vegetation of the Karoo, have from an agricultural point of view, meant a decrease in the grazing capacity of the Karoo (Roux and Vorster, 1983:25). Blinded by human exceptionalism, it took farmers a while to notice the effects of overgrazing. Yet, the loss of diverse (and palatable) plant species, the same plants that their livestock rely on for pasturage, also meant the loss of all the probability of their own economic survival. In the Karoo the past continues to haunt the present. The ghosts of plant-less patches of soil are everywhere and these patches have demanded farmers to pay attention to the multispecies entanglements necessary for ecological revival. It was the destruction of the Karoo veld by the great-grandparents, grand-parents, and parents of farmers I visited, that demanded farmers today to rearrange and reimagine their own land care practices. I have worked with livestock farmers in the Karoo region who identify their work as a kind of reclamation of what their fore-parents decimated. This thesis will therefore show how livestock farming in the Karoo has become attuned to the work of "transformation and ecological recuperation" and thus it asks what might be the "ways of being together"? (Despret and Meuret, 2016: 24).

To know the ways of being together, farmers had the responsibility of learning about the condition of life in the Karoo, a 400 000 km² semi-arid region situated in the interior of South Africa (Nel and Hill, 2008:2264). The name "Karoo" finds its origin in the indigenous language of the Khoisan and it is thought to mean "thirstland" (Jorritsma, 2012:383). When I began this research project, the Karoo had endured three years of drought — the most "intense" drought in living memory according to the inhabitants of the Karoo. Thoughts of a "land of great thirst" were everywhere around me. Drought, it seemed, had become the norm, and rainfall the exception. Ecologists speak of the conditions of liveliness in the Karoo as "slow", "unpredictable", and "harsh" (Esler et al., 2010) and farmers practices were allied to these conditions. Martin, a farmer in the Prince Albert region described the unruly conditions of life in the Karoo as follows:

> Martin: Die Karoo se hart loop stadig - as dit reën dan klop hy, en dan vat dit lank tot hy stil is. En dan reën dit eers weer oor ʼn jaar of drie jaar, of vyf jaar en dan klop hy weer. Dis vir my ʼn ongelooflike mooi beskrywing van die Karoo.[5] [The Karoo's heart beats slowly – when it rains, it beats, but then it takes a long time until it is quiet again. And then it only rains again in a year's time, or three years, or five years, and then it beats once more. To me, this is an incredibly beautiful description of the Karoo.]
>
> T: So [die Karoo] werk op ʼn ander ritme - as byvoorbeeld ander areas. [So, the Karoo has a different rhythm to other areas?]
>
> M: Ja en as jy dit in gedagte hou, dan maak dit baie meer sin. Al jou besluite moet aan dit gekoppel wees, want dit is net hoe dit is. Jy kan nie vir iemand se jy moet meer plante groei nie - jy kan gaan plantjies plant maar hulle sal nie groei nie. Want hier is nie genoeg water nie. [Yes, and if you keep that in mind, then it makes more sense – all your choices must be connected to that, because that's just how it is. You can't tell anybody that they must grow more plants – you can plant seedlings, but they will not grow, because there is not enough water here.]

[5] Martin was the only Afrikaans farmer. Interviews with him were conducted in Afrikaans, they were transcribed and translated by me. I have anonymised all research participants in this study. See methodology section.

T: Maar daar is nog steeds maniere om beter te boer as ander? [But there are still better methods to farm than others?]

M: Mmmm ja. So byvoorbeeld as jy nou daai dinge in gedagte hou. Daai stadige klop, so jy moet meer luister na die natuur - jy kan nie dit force nie. Jy weet op lande, jy kan eintlik nie jou land op mors nie want jy kan daai land oorbewei en as die goed vrek dan saai jy weer ander. En jy maak hom nat, en hy produseer, jy kan hom eintlike nie tot niet maak nie - oorbewei. Verstaan jy wan't alles kan jy beheer, hier kan jy eintlik niks beheer nie. Jy kan net die aantal diere wat jy op die veld het beheer. Maar jy het nie beheer oor die reën. [Mmmm, yes. For example, if you keep those things in mind, that slow beat. So, you must listen to nature more – you can't force it. You know on pastures, you can't actually destroy your land, because when you overgraze the land, and it all dies, then you sow seed again, then you wet it, and it will produce, you can't destroy it by overgrazing, do you understand? This is because you can control everything. In the Karoo, however, you can't control anything, except for the number of animals that you have on the veld. But you don't have control over the rain.][6]

This conversation paves the groundwork for introducing questions of the conditions of a Karoo livability. For Martin, liveliness depends on the rain, and rain in the Karoo is inconsistent and little, posing a problem for an imagination of time as linear, cyclical or repetitive. The slow and inconsistent heartbeat of the Karoo, as Martin explains above, does not conform to a logic of predictability. Instead Martin, and other farmers I spoke to, are working in an environment that is troubled by unpredictability, and to bring this unpredictability to the centre of their engagement with making life in the Karoo is what Martin describes as "listening to nature" because "you cannot force it". Martin understood that if he wanted to make life in the Karoo, he needed to mould his thinking, decisions and practices according to a particular Karoo "logic". This logic, as I will unfold, is allied to the multiple worlding projects that occur in the Karoo. Ones that pay attention to the relations between seeds, soils, animals and plants. This is because, as I have learned along with the farmers in the Karoo, soil is never only soil, rain is never only rain, and seeds are never only seeds. Their vitality and life enhancing capacities are realised in their relations to each other. This logic is especially pertinent in the Karoo context, since its aridity, as Martin explains, limits human intervention. You cannot sow seeds, because the semi-arid environment does not allow for the cultivation of the Karoo landscape.

[6] Interview with Martin in April 2018.

Thus Martin, much like Kohn's question of *How Forests Think*, is extending the work of ethnographic attention to that which lies beyond, outside or nearby the human (2013:9). In doing so, Martin's attention to what he understands as the demands of the Karoo veld, and all the social connections within that landscape, determines his own place in the sociality of the more-than-human world.

The Karoo is a place where people, bushes, insects, animals (both wild and domestic), grasses, seeds, soils, stones, water (underground and otherwise), infrastructures and even natural gas[7] in recent years are entangled in stories of the living and the dead and everything that happens in-between. These are the everyday stories of the Anthropocene and in the Karoo, they are multiple. It is no easy task to tell these stories, they are lived in everydayness in the Karoo, and they are also destroyed in the everyday practices of the Karoo. Therefore, this thesis intends to narrate a thick and fleshy anthropological account of imagined futures, whereby humans are seen as living with, and living within, a more-than-human-sociality (Tsing, 2014).

LITERATURE REVIEW

Haunted histories

A newer body of research concerning questions of how we might deal with "the mess of the damaged worlds that we inherit and bequeath to future generations" (Taylor et al., 2015: 129) situates the inheritance of the degraded Karoo landscape as an important frontier of such an academic enquiry. Environmental alterations, much like the broader and deepening concerns around anthropogenic environmental change, speak to the ways in which humans and nonhumans are entangled in multispecies worlds that force us to rethink the imagined modernist separation of 'nature' and 'culture' in a time where the "possibilities of life and death for everyone are at stake" (Rose et al., 2012:2). The modernist paradigms have produced anthropogenic landscapes that are rooted in a singular imaginary of 'progress' which has trained "the human eyes only on the immediate promises of power and profits" (Tsing et al., 2017: G2). Moore describes this as the "crisis of capitalism" where 'nature' and 'humanity' has been divided and essentialised and where capitalism has cheapened nature through a process of externalisation, commodification and appropriation (2016:3; Klein,

[7] In recent years the possibility of hydraulic fracking in the Karoo has caused a heated debate (see van der Merwe, 2015 & Green, 2014)

2014). In his seminal question, *Anthropocene or Capitalocene?* (2016), Moore diverts the overbearing emphasis on the essentialised 'human' in discussions of anthropogenic environmental and ecological destruction into an enquiry of the impact of capitalist extraction (2016:7).

In *Anthropologists are talking – about the Anthropocene*, Tsing (2016) recognises this shift in thinking of capital as a means for knowing the Anthropocene and as an important way of coming to know how the relationship between investment, property, control and mastery has made it possible to turn ecologies into something completely different (Haraway et al., 2016:556). This is a process whereby human-nonhuman relations have been rearticulated in a festering and slow-moving violence. Nixon refers to this as A *Slow Violence* – a violence "of delayed destruction that is dispersed across time and space" (2011:2). The destruction of places of refuge for humans and nonhumans has come to characterise this moment of the Anthropocene (Haraway, 2015:160). Moreover, despite the forwarding of these categories of species according to "outrageous" dichotomised imaginings (including the nature/culture binary), "species on both sides of the line - including humans - live in complex relations of dependency and interdependence" (Tsing, 2012a:144). The Anthropocene has brought these relationships to the fore (Haraway et al., 2016). However, as Tsing writes, "human exceptionalism blinds us from species interdependence" (2012:144). This heritage has allowed us humans to practice and imagine ourselves as "autonomously self-maintaining", and therefore as being outside of interspecies relationships, but "human nature is (always already) an interspecies relationship" (Tsing, 2012a:144). "If we appreciate the foolishness of human exceptionalism" writes Haraway in *When Species Meet*, "then we know that becoming is always becoming with" (2008:244).

This notion of "becoming" is a useful transition into understanding how the introduction of technological change in Karoo farming practices, and the accompanying domestication of not only sheep, but also other animals, plants, water and soil has always been a process of "becoming with". Alaimo (2017) also reminds us to refrain from rearticulating our thinking around the Anthropocene in one that situates humans as the sole geologic force causing environmental destruction. Instead, she challenges the thinking (of the Anthropocene) that re-confines us into the bounds of human exceptionalism, both in the inability to speak to the meaningful differences between groups, histories and practices, as well as to the heterogeneous assemblages of human and nonhumans that mark anthropogenic change (Grusin, 2017:xiv). In *Materialist Returns,* echoing Alaimo, Whatmore critiques the making of landscapes as an articulated and "exclusively human achievement" instead

insisting on "more-than-human modes of enquiry" (2006:604). Thus, in the context of the Karoo, it is important that the destruction of the landscape is not only seen as a *human* (general) force, but rather that the advent of fixed boundaries speaks to the colonial legacy that enshrined private property rights and "modernists sciences offered the techniques necessary for colonial dispossession" (Green, 2016:3).

The impact of livestock on the environment and the subsequent decline of societies has been documented as far back as 6000 BCE (Grove, 1995:18). According to the Environmental historian Richard Grove it was often the introduction of European animals into new colonial frontiers that caused the beginning of anthropogenic environmental degradation in these regions (1995:63). In *Green Imperialism* Grove describes how the presence and introduction of goats by colonizers on islands, including St. Helena and Mauritius, were the "single more effective agents of deforestation" and ecological change. Similarly, Elinor Melville has written extensively on the impact of the introduction of sheep in the 16th century into the Valle de Mezquital, Mexico in *A Plague of Sheep*. Melville illustrates how hoofed animals, in particular sheep, spurred what Crosby refers to as an "ecological imperialism" (1988, cited in Melville, 1997:1). "Sheep, not men, dominated the ecosystems of the Valle del Mezquital and shaped its landscapes", Melville writes (Melville, 1997:39). Domestic grazing animals, as she argues, were part of the culturally defined system of range management and accompanied the expansion of colonial interests in the region (Melville, 1997:8). Melville documents the environmental effects of the colonial conquest of the Valle del Mezquital and the shift from what she terms a "human-centered landscape" to an "animal-centered" landscape (Melville, 1997:14). Much like the Karoo, the overstocking of sheep in this semi-arid region stripped and impoverished the soil causing widespread environmental degradation. The environmental degradation occurred in a very short amount of time and yet, as Melville documents, the social and environmental consequences remains present until today. Understanding the effects and potentials of range management on the ecology has been central in the work of Geographer Nathan Sayre. Sayre has called for the need for qualitative research into understanding ranch management (2004) so as to not confine knowledge of rangelands into academic silo's, but rather that the human dimensions are understood as integrated in the ecological outcomes of rangelands (Briske et al., 2011).

Multiple Ontologies - multiple species

A "more-than-human" mode of enquiry has concerned itself with "rethinking the separation of 'nature' and 'culture' as universal categories or polar opposites" into new and other topologies (Haraway, 2003:8). This is the foundation upon which multispecies ethnographers are "studying the host of organisms whose lives and deaths are linked to human social worlds" (Kirksey and Helmreich, 2010:545). "Anthropology beyond the human is perforce an ontological one" writes Kohn (2013:10). The groundwork for such an approach requires us, as anthropologists, to think about ontological plurality. Kohn's ethnography acts as an important cornerstone for thinking about the multiple worlds that exist beyond the human, whereby he argues a new kind of "we" emerge as we interact with other and multiple species. Through using the concept of "entanglement", Barad suggests that entities are not fixed or determined before they enter into relations with one another, rather they materialise through their very relationalities (2003:827). In this sense, this ethnography comes to know the human and the nonhuman through their mutual relationality.

The inquiry into "relational ontologies" is important for dismantling the modernist distinction between one 'nature' and multiple 'cultures' (Blaser, 2013:15; Lyons, 2014). Moreover, a concern with ontology challenges the further reaching binary divides that are fundamental to Western ways of knowing and being, including divisions between "concepts and things, humans and nonhumans, and subjects and objects" (Lien and Law, 2011:69). Thus, the reconfiguration of ontological plurality intends to move away from a culturally relativist anthropological position that centres on coming to know "different worldviews" and instead, drawing on the work of Viveiros de Castro, it is interested in coming to know "different worlds" (Kohn, 2013:10). Mol's work on *The Body Multiple* (2002) is a useful transition into thinking about a scholarship concerned with enactment rather than knowledge. Mol is undeterred by attempts to criticise the appropriateness of various enactments, instead she is trying to think about and contribute to theorising "ontological politics" – "a politics that has to do with the way in which problems are framed, bodies are shaped, and lives are pushed and pulled into one shape or another" (Mol, 2002: viii). Drawing on the work of Mol, Lien and Law (2011) uncovers how enactments vary from place to place and from practice to practice. However, as they show, approaching landscapes (salmon is their example, sheep is mine) in its various enactments allows us to question how reconstituting landscapes might enact multiple relationships and might engage in multiple ways of knowing the land (Lien and Law, 2011:66-68).

Multispecies enquiries produce "mutual ecologies" (van Dooren and Rose, 2016:80) that tell stories about the world as emerging through networks (Latour, 2013:21), swarms and in webs of social relations (Tsing, 2015:36). These stories are interested in a "return to enduring preoccupations with processes and excesses of 'livingness' in a more-than-human world" (Whatmore, 2006:605). However, as Paulson (2001) argues, it is not enough to merely include nonhumans in accounts of multiple worlds, the point must be to "learn how new types of encounters (and conviviality) with nonhumans […] can give rise to new modes of relation with humans" (in Whatmore, 2014:79*)*. Following Haraway's insistence that a new name is needed for this moment where "ongoingness is at stake" - the Chthulucene. This research, in thinking with the Chthulucene (but also the Capitalocene and Plantainocene) intends to grapple with how "intense commitment and collaborative work and play with other terrans, flourishing for rich multispecies assemblages that include people" may be possible (2015:160).

Living futures

This research is interested in the processes of renewal and decomposition that tell us about the ways in which entire ecologies — including soils, plants, animals, waters and farmers — "collectively change the conditions of their lives" (Lyons, 2014:65). In borrowing from Lyon's work that traces the "creative emergences and actual work occurring in the present when cultivating different conditions for life and death" (2014:66). This research is concerned with the histories that both make but also destroy multispecies livability. A return to the livingness of the world, according to Whatmore, requires a return to the conjunction of the geo (earth) and the bio (life) (2006:602). For Whatmore this return to the livingness of the world shifts articulations of the world 'out there' to the "intimate fabric of corporeality that includes and redistributes the 'in here' of the human being" which insists on addressing the entire field of the living (ibid.). This, she argues, is a redirection that is concerned with 'more-than-human' approaches to the world, but it also evokes the new kind of "we" that emerge when we interact with other species. Kohn conceptualises this through, what he refers to as "ecology of selves" (2013:17). It is not enough to track the histories that make multispecies livability possible, instead as Tsing et al. has argued, we must "wonder through landscapes, where assemblages of the dead gather together" (Tsing et al., 2017: G5). However, harkening back to Kohn's conceptualisation "ecologies of selves" we must stand as self in relation to many other kinds of selves. For Kohn, "being selves to ourselves and each other" requires us to continuously pay attention so as not to kill *relation* (2013:18). In this research, part of this work attempts to shift ways of thinking that

centralise the human (including the researcher), but it aims to recognise the shifty and dynamic engagements between selves and other selves, whereby we are firmly rooted within ecologies and not bounded in an oppositional imaginary of "us" and "them".

In line with Kohn, Latour (2014) argues that the acceleration of ecological destruction requires us, requires us, the "inhabitants of the shrinking domains of life" to ask, how can we "compose the common world" without exterminating one another? This thinking resonates with the work of Haraway who through a feminist scholarship seeks to understand "how things work, who is in action, what might be possible and how worldly actors might somehow be accountable to and love each other less violently" (2003:7). What might be possible, is a question that is relevant for a scholarship concerned with thinking about futures of multispecies life since "living things (already) includes futures" (Kohn, 2013).

Drawing on the above literature this research will be concerned with paying attention to the ways in which colonialism and the advent of private property, modernists sciences, capitalist intentions, human mastery and domestication continues to haunt the present ways of life in the Karoo. In doing so it will frame the Karoo as a "haunted landscape", firmly rooted in the context of the Anthropocene as well as the Capitalocene. Whilst recognising how past ways of life are present in the landscape, this research intends to tell a different but related story. It intends to tell a story whereby - drawing from Haraway (2008), Tsing (2013), and Kohn (2013) and other thinkers - the multiple, intersecting and relational ontologies that gather amongst humans and nonhumans in the Karoo landscape is told as a multispecies story. This research is about understanding the ways in which 'coming to know' "attunes to, interacts with, and shapes its objects into being" (Mol, 2002:viii) and how these objects assemble a plurality of ontological worlds. The goal of this research is therefore to break open these relationships that have come to gather in the living and the dead of a Karoo landscape that is desertifying and mourning, but also engaging in futures that uncover the ways in which "biological-cultural-political-technological recuperation and recomposition" is made possible (Haraway, 2015:160). Thus, it will be a story of unbecoming and becoming in multiple human/nonhuman life and death arrangements. Moreover, it will, borrowing from Tsing, inquire into the *Possibility of Life in Capitalist Ruin* (2013), whereby reconstituting the land and landscape (the soil and plants) is a story concerned with future ways of life. Thus, this research intends to pay attention to the imagined

futures for the Karoo, whilst contributing to a growing scholarship concerned with an ontological plurality that asks how might we live with[in] multispecies worlds.

METHODOLOGY

This research is inspired by an article that was published on an online platform "Karoo Space" (Marais and Du Toit, n.d.) in which the work of two "progressive farmers" in the Karoo is discussed. The article quoting farmer Doug Stern brings the intention of this work to the forefront: "I knew that if we were going to survive, we had to find a different way of farming. Something more holistic" (ibid.). This research follows the work of eight farmers who understand their work as reconstituting the soil and land in an attempt to restore the severely degraded Karoo landscape that they inherited.

I started this research process by contacting a Karoo farmer, Peter, who was advocating his work and practices of veld reclamation. Since the community of farmers in the Karoo, who see their work as engaging in active attempts to restore the landscape is small, I was able to recruit participants through the technique of snowball sampling where research participants recruit other participants (Atkinson and Flint, 2001). Thus, I got into contact with many farmers by referral of other farmers explaining that I needed to see the result of land care practices of their own friends or family members. "Hanging out"[8] in the Karoo was a way for me to gain access to the stories that make up this research. I conducted interviews with eight farmers: Peter, Robert, Michael, Martin, Phillip, Angus, Caroline, and Anton. Of these farmers, I visited seven of their farms, with the exception of Anton who I met in the town of Graaff Reinet. The farmers participating in this research were, for the most part, English speaking white men, apart from Martin who is a white Afrikaans farmer and Caroline who is a female farmer. This thesis is a result of fieldwork conducted between February and April 2018.

Situating the field

The Karoo is a large semi-arid region situated in South Africa. It is in part defined by its geology, topography, climate and vegetation, but it has no clearly demarcated boundaries. The Karoo has been separated into two sub-regions – the Great Karoo and the Little Karoo, which are separated by the Swartberg Mountain range. The Karoo comprises of two distinct plant biomes, the Nama Karoo Biome, geographically situated almost entirely in the Great Karoo, and the Succulent Karoo Biome. Due to the low precipitation in the Karoo, it is not suitable for cultivation, and is mostly suitable as a rangeland for livestock and game (Smet and Ward, 2005:59). I focus on this landscape component. This research took place in the Prince Albert region and the Graaff Reinet region. These regions are

[8] See Geertz's (1998) fieldwork method on *Deep Hanging Out*.

both situated in the Great Karoo, but their climatic conditions vary significantly. Prince Albert has a much lower annual rainfall, whilst Graaff Reinet has a higher annual rainfall making it more favourable for grasses and increased ground cover. This difference also impacts the landcare practices of farmers and has been important for understanding that the conditions of generating a livable Karoo vary from region to region or farm to farm.

The ecological work of farmers is closely tied to their economic survival. The wool industry has played an important role in the South African economy, however, since the 1970's there has been a steady decline in the Karoo economic contribution (Nel & Hill, 2008:2269-2270). A significant amount of research has pointed towards "dry land degredation" and the resulting decrease in the carrying capacity of rangelands as the cause for the decrease in sheep and thus wool production. In recent years the increase in wildlife farms has further decreased this number (ibid). Despite the astronomical decline in wool production in South Africa, wool continues to be a major agricultural export commodity. In the 2018/2019 season Cape Wools SA recorded the amount of wool exported in Rands as over R4 billion, and in 2018 Buisiness Day reported that wool accounted for 4% of all agricultural exports, making it the sixth largest exportable-commodity (Phakathi, 2019).

Figure 1: Map situating the Karoo in South Africa.

Interacting with farmers and nonhuman

This research, following farmers interested in rehabilitating the Karoo landscape, is first and foremost concerned with "telling the stuff of living" (Haraway, 2016a:118). This 'stuff' does not only think about the heroic farmer doing the good work of reconstituting what our forefathers decimated. It tells of all the other nonhuman's that make life in the Karoo. It is because of them that this work is paramount, since their presence or death demands us to pay attention. Therefore, this thesis is about my own observation and the observations of my participants as an empirical and therefore perforce, an ontological exercise in tracing the relationships between material infrastructures, water, vegetation, soil, animals, and humans. In the tradition and insistence that knowledge is best practiced when situated, I understand the observations recorded in this thesis as "situated knowledges" (1988). Hereby I wish to acknowledge that the knowledge produced in this thesis is already partial in that my location as a descendent of Karoo farmers positions me in such a way to ask some questions, whilst forgetting others. I introduce this thesis by positioning myself both as a researcher interested in reclamation as well as a person with an intergenerational knowledge of the Karoo landscape.

This research is comprised of semi-structured interviews and informal conversations with farmers, mostly, but also ecologists, developers, and students who are working in ecological restitution in the Karoo. Participant observation has been the primary method for tracing the ways in which farmers in the Karoo are working with the land in order to regenerate multispecies living. I have observed the daily routines, practices and interactions between farmers, soils, water, plants, livestock and any other actants who labour within the environment where this work is being undertaken. Part of the observations were, firstly, to pay attention to the ways in which the metabolism in the Karoo has been disrupted, and secondly, whilst drawing on the work of Marx (1962), to understand how these metabolic rifts are being reconstituted in human, nonhuman and other-than-human assemblages (in Foster, 2000:163). This work is deeply concerned with the ways in which human action has shaped, controlled and touched the Karoo landscape. At the same time, in line with scholars like Kohn (2013) and Ingold (2011), this research is dedicated towards creating an anthropology beyond the human. Thus, part of this research methodology is about listening to life that gathers between, close to, but also without the human, since "telling stories of landscapes requires getting to know the inhabitants of the landscape, human and not human" (Tsing, 2015:159). Uncovering this "ontological plurality" has required a close attentiveness to these worlds (Kohn, 2013). Participant observation was therefore not only centred on the human, but also extended to the more-than-human socialities that form part

of the Karoo. Thus, to tell multispecies stories is to open up the myriad of entangled relations that together produce a social landscape. This research contributes to ethnographic enquiries that are concerned with other-than-human worlds of which we form part of. To do so, I have turned to stories.

Storying

In line with van Dooren and Rose (2016) storytelling is a methodological cornerstone in my own coming to know of the entanglements of multispecies worlds. Making use of stories in ethnographic work is a powerful way of translating "connective thinking" that is accountable to otherness (van Dooren and Rose, 2016:85). Throughout this thesis I have made use of "storying animism" and "ecological animism" in order to bring about and translate a vitality, presence and liveliness to the more-than-human worlds (ibid.). This is useful for coming to know the relational becoming between human and nonhuman stories who together produce the conditions for a Karoo liveliness. Some of these stories are informed by memories of past encounters (like the example of the trekbokke or even grass that has become extinct) and some describe new encounters that flesh out the possibilities for other kinds of Karoo futures. Following Haraway, this thesis thinks of "storytelling for earthly survival" (Haraway, 2016b).

Walking the landscape

Drawing inspiration from Ingold and Vergunst's (2008) *Ways of Walking* as a way to contribute to ethnographic practice, this research has used walking the landscape as a methodological tool. Walking the Karoo landscape has formed part of my own memory of being part of that landscape, as the prologue of this thesis describes. Moreover, walking has been described as a means by which stories are converted into knowledge (Ingold and Vergunst, 2008:6) as it details the practices of everyday life (de Certeau, 1984). Drawing on this, bodily movements, perceptions and the work of senses are ways of gathering data as I frequent the landscape and walk alongside, around, between and in the social worlds that nonhumans make and occupy (Ingold and Vergunst, 2008:1,10). This methodology has been vital for collecting data that is not only based on visual perceptions of the land and landscape, but that is concerned with listening and feeling and embodying the multiple relations that are enrolled in the making of social worlds. This kind of work has required close attention be paid to the ways in which material practices are enacted (Lien and Law, 2011:68). Thus, it asks critical questions around how the reconstituting of the Karoo landscape enacts multiple relations in everyday practices. Practice will hereby become a central "matter of concern" (Latour, 2004) in order to

produce knowledge that is concerned with ontologies "sustained and withered away in common, day-to-day, sociomaterial practices" (Mol, 2002:6). Walking the landscape is essential in farming practices, especially in the context of sheep farming in the Karoo where sheep, who are enclosed in large camps, are gathered together on foot as they are moved to new camps or smaller enclosures.

Posthumanist ontologies, truth and knowledge production

There has been a call for anthropology to engage with the multiple ways in which the social worlds of humans are shaped by and shape the environment (Hastrup, 2013:5). I think with Tsing of multispecies as a useful way of understanding the world making projects that move beyond "human exceptionalism" (2013:162). Rather, this research is concerned with uncovering the relational ontologies that come to gather on various farms and with storying these mutual ecologies that come to gather in the Karoo.

To do this work, I must emphasise that this research is drawn from the experience of the farmers I met in the Karoo – and these multispecies landscapes I trace are the ones that they have come to know, and rely on. Pitt (2015) has written on "knowing by showing" as a method for coming to know more-than-human geographies. Pitt argues that this can be done through "techniques of walking, talking, doing and picturing, which encourage guides – human and nonhuman – to share their expertise" (2015:48). Much of the knowledge in this research was "shown" to me by participants whose everyday work in the Karoo guided me through the nonhuman worlding projects that occur alongside them. Their guidance exposed me to the sensitivities of discovering the worlds of soils, seeds, sticks, water, animals, and plants in the Karoo, which in turn encouraged me to "follow the flows" of "livingness" (Ingold, 2011; 2013). The aim here was not to represent or to speak on behalf of nonhumans, but rather to open up for a methodology that "seeks to understand those other than ourselves" (Pitt, 2015:48).

My research questions pertain to the condition of generating a Karoo liveliness. However, it is important at the onset of this research to emphasise that the ethnographic stories I recount in this thesis describe a particular reality of Karoo livability from the farms I visited. Therefore, I do not describe a Karoo reality in generality, but instead particular realities as told by the farmers attempting the work of regenerative life in the Karoo. Every farm, and every farmer had particular experiences and practices to show for the work of reclamation, and I imagine that each part of the Karoo might

have different stories of living and dying depending on from where one looks. This resonates with Haraway's account of ontology, in which she argues that researchers do not need a doctrine of objectivity that promises transcendence (1990:187). Following this, objectivity can only be about particular and specific engagement in which only partial perspectives can promise objective visions (Haraway, 1990). In borrowing from Clifford, I am in agreement that "ethnographic truths are [...] inherently partial - committed and incomplete" (1986:7).

In bringing questions of meaning, ontologies and the politics of knowledge production into environmental domains, we are able to set forth a notion that refuses reductionist accounts of objectivity and rationality. The degradation of the Karoo remains heterogeneous and it is impossible to tell one story of degradation, since every farm and every piece of land has its own and multiple intersecting histories that have shaped the landscape in one way or another. Thus, the ethnographic stories I recount in this thesis occur on eight different farms, all with their own stories of degradation, and their own stories of reclamation. I therefore speak not on one Karoo, but rather on bits and pieces of a larger, but "patchy" Karoo story. The use of stories as a method has been a challenge since they cannot be "neatly summed up" (Tsing, 2015:37). Rather, the complexity of experiences of life making in the Karoo directs this ethnographic work to an unpredictable, overlapping and at times seemingly contradictory stories which speak to the broader, complex worlding projects of humans and nonhumans in the Karoo – whose work I could only witness briefly.

ETHICS

This research was guided and shaped by the Ethical Guidelines and Principles of Conduct for Anthropologists (2005), produced by Anthropology Southern Africa. Bearing this code of ethics in mind, I obtained informed consent from all the research participants. For this consent to be gained, research objectives and aims were made clear so as to ensure that the participants in my sample could negotiate the terms of consent. I have anonymised all farmers in this research. I also have anonymised the names of the participants' farms. However, I have not anonymised the regions in which they farm, since climatic and topographic information is important in understanding research pertaining to the environment.

There were no direct benefits of participating in this research. However, in working with farmers in the Karoo who imagined their practices to engage in the rehabilitation of the landscape, many of the farmers were determined for their knowledge to be disseminated to a broader audience. Moreover, they were determined that the often-assumed narrative of livestock farming being the cause of environmental degradation in the Karoo, be rewritten to include farming stories that are aligned with ecological reclamation.

Being that, this research is anthropological, meaning that the researcher's body is the primary means of gathering ethnographic data, I am required to be aware and reflective of my own positionality throughout this research. Rose et al. have advocated for us to position ourselves as participants in "lively ecologies of meaning and value, entangled within rich patterns of cultural and historical diversity that shape who we are and the ways in which we are able to 'become with' others" (2012:2). It was an ethically considered decision to work with white farmers in the Karoo, since I am a white woman with an intergenerational familiarity with the work of farmers in the Karoo. However, this required me to be attentive to the ethical concerns and the ways "home blindness", often associated with "doing anthropology at home", may have influenced this research and what might go unnoticed (Lien and Law, 2011:69).

In this research, I may have contributed to the multiple histories that have for centuries been written out of popular narratives of a Karoo "wilderness" (Atkinson, 2016) including the first people of South Africa. My intention is not to further contribute to the erasure of the histories of the first people of

South Africa. However, owing to my positionality as a white female in South Africa[9], I feel that this is not my story to tell, but it is a story that needs to be told. Working with white farmers is always political in the South African context, where their and my own heritage of land dispossession continues to haunt the Karoo landscape. At the time of this research, discussions of land expropriation and redistribution was and remains of central concern. I recognise the importance of "becoming witness" to own intergenerational histories of land degradation and dispossession (van Dooren and Rose, 2016:89). In line with van Dooren and Rose, I imagine that the dynamic act of witnessing the world in its relational becoming is a way in which to be committed to the accounts of living that are entangled with ethics, care and concern (2016:89-90).

I have remained dedicated to my primary role as an anthropologist to 'do no harm'. The commitment to 'do no harm' has been pertinent to my coming to know other participants in the research including nonhuman participants and all other species. To do so I have reflected on the role of ethnographic authority (see Clifford, 1986) and throughout this research I have remained transparent with my co-participants by continuously discussing my own research agendas and findings with them. I have been concerned with the co-production of knowledge with all the participants (human and nonhuman) that come to gather in this research. Thus, my role as researcher has been in producing thick and fleshy accounts that come to bear witness to the other ways of being; ones that involve humans and other living and non-living beings.

Working both within the realm of the human and nonhuman has required me to extend my ethical consideration to the worlding projects that might not be recognised in human terms. Barad calls for a "posthumanist ethics" whereby ethics involves a recognition of responsibility and accountability in mutual entanglements occurring between humans and nonhumans (2007:392, 2012). I have, in this research, taken the first step towards my responsibility as a researcher to the other-than-human worlds that we are always entangled with. To notice these worlds is an ethical concern that has demanded me to critically reflect on my role as a translator of our entanglements with these worlds in the Karoo. I recognise that this research is an attempt to tell part of a much larger story of worlding in the Karoo.

[9] Being able to be critical of my own positionality and thus my own lens as a white female in South Africa is inspired by the discussion, particular those pertaining to 'whiteness', brought about by the Rhodes Must Fall movement that occurred at the University of Cape Town in 2015.

CHAPTER OUTLINE

Chapter two, *A case for the oikological*, introduces the problem of the inheritance of ecologies of damage in the Karoo by tracing the ways in which past social, economic and technological relationships remain engraved in the Karoo landscape. The decimation of the once prolific multispecies ecologies, as this chapter argues, has demanded farmers to bear witness if they wish to continue making life in the Karoo, since their economic survival depends on these ecologies. This chapter discusses how ecological well-being and economic prosperity is not mutually exclusive on Karoo rangelands. Rather, if paid attention to, they jointly implicate future livability.

I save a detailed description of the introduction of infrastructural development and the subsequent anthropogenic degradation of the Karoo landscape for chapter three, *Looking over the fence*. Here, I give a historical overview of the effects of fencing and windmills, the subsequent overgrazing it allowed for, and the demise of the great springbuck treks which also meant the demise of multispecies entanglements that they instigated. Moreover, this chapter elaborates how infrastructures, with a focus on fencing, have become grounds for new ontological practices of regenerating the Karoo veld. These practices of regeneration use fencing and the practices that surround it as a tool to mimic the animal ontologies of the ceased migrating antelope. This chapter answers the question of what might fences do, by arguing that this depends entirely on the practices and relations in which they are manipulated. These practices have become a way for farmers to bring back what they believe is "the way nature had it".

Chapter three provides the groundwork for chapter four, *Enacting a Karoo 'nature'*, where I further unfold the multispecies entanglements that are enacted in the everyday practices that occur inside the fences of a Karoo livestock farm. Here, I elaborate on how sheep, emblems of domestication, have been animated as destroyers of the Karoo veld. Their monstrous entanglements, as I argue in this chapter, are entirely dependent on the relations within which they are enacted. Today, their bodies are being used as a way to instigate multispecies liveliness. Inspired by Mol (2002), I discuss the "sheep multiple" in this chapter. In doing so, I consider what counts as 'nature' in situations where domestic livestock are enrolled in practices that are believed to enact and mimic icons of wilderness in a quest to bring back 'natural' Karoo vegetation. This chapter undoes the paradigms that articulate 'nature' and 'culture' as separable entities, by understanding how domestication and wilderness shape each other in a variety of ways whilst producing a particular ordering of Karoo 'nature'.

CHAPTER 2

A Case for the Oikological: Reparative Ecological and Economic Work in the Midst of Karoo Ruin

> Michael: "Anyway, getting back to [the discussion of] veld, you can go from farmer to farmer and have different success stories, and we are all striving for the same thing: profitability"[10]

The above quote is from an early morning discussion with Michael, over a cup of coffee, in his large luxurious home enclosed by a perfectly manicured garden. I had visited farmers, like Michael, whose work was closely tied to rehabilitating the Karoo veld, with the intention of coming to understand the arts of living on a damaged planet. When Michael responded that the underlying drive of regenerating the Karoo veld was, according to him, the same for every farmer "profitability", I felt caught off guard and disappointed. Up until our discussion I had naively framed this work as a deep sense of love for the Karoo, a selfless love [11] – of the land, and plants, and seed and soil of the Karoo. This notion of "profitability" did not sit well with my understanding of ecological restoration (or conservation). Instead, I understood the role of capital extraction as the driving force of ecological destruction, species extinction, and environmental ruin. The Karoo is also a landscape that has been forced to conform to the logic of capitalist extraction with sheep as the major economic impetus (Archer, 2000; Roche, 2009). However, as I will show in the following chapter, the Karoo never quite conformed to the human-centered landscape making practices inspired by modernist and capitalist ontologies that imagined themselves and their sheep as "autonomous entities" and "separable kinds" (Tsing, et al., 2017:M1-M2). Rather, the decimation of the once prolific and multispecies landscapes of the Karoo has demanded farmers to bear witness to these landscapes, since the decimation of these landscapes also meant the decimation of all possibilities of their own livelihoods. Learning alongside the Karoo about the arts of living on a damaged landscape draws together and unfolds the intersection between ecological well-being and economic incentives. I will argue that together they produce the

[10] Interview with Michael in March 2018.

[11] The farmers I worked with did express a deep love for the Karoo and their care for the land was expressed in "leaving the land in a better state than they had received it", but it was not only care that drove their practices of land regeneration, it was also economically driven.

conditions for life on a Karoo farm – what Green refers to as a "reparative oikologics"[12] (2014:7). A reparative oikologics thinks about ecology and economy, jointly, in a time where "economy and ecology are pitted as opposites" (Green, 2014:7). Yet, as I show in this chapter economic prosperity and ecological well-being[13] are not mutually exclusive, but rather they jointly implicate future livability.

Ecologies of deep time: how ghostly kraals remind us that the past matters

The ecological materialities of the Karoo embeds the past political, economic and social relations as stark reminders of what has been, and what has been lost. I will start at one of the most explicit and riveting examples of this — one of my first days walking in the Karoo veld. Embedded in the veld was a piece of land that was circular in shape, a subtle crater[14], indented where the soil had washed away and where almost no plants had established. What lay inside the circular shaped indentation were fragments and shards, in the form of baked pottery with magnetite resembling "glitter" and seashells, most likely collected on the east coast of South Africa by Khoekhoen[15] who would have seasonally made their life in this region of the Karoo. I saw this plant-less basin only because the botanist and ecologist, Sue,[16] pointed it out to me; something she frequently had to do with tourists interested in the rehabilitation work she was doing on this strip of land, now a nature reserve and conservation area for environmental education and research (Dean and Dean, 2018). This was most

[12] Green uses the term "reparative oikologics" in response to the recent polarised debate on fracking in South Africa. Green carefully unravels the discussion of fracking as an economic "game changer" in the context of a still highly unequal post-apartheid South Africa, whilst at the same time being protested in a predominately "White" environmental discourse (Green, 2014:3-4). Green reframes the debate on fracking in South Africa by making a case for a "reparative oikologics", where economy and ecology (oikos) are understood together as producing the conditions of liveliness in the anthropocene (Green, 2014:7).

[13] Fioramonti (2017) has advocated for what he refers to as a "well-being economy" (see also Green Economy Coalition. 2012), an economy that goes beyond the narrow focus on GDP as a marker of success, but one that is accountable to and seeks social and ecological well-being. The "Gross Domestic Problem" writes Fioramonti, is predicated on short-term policy planning (electoral cycles), but the value of the gain of capital at the expense of the environment and its natural resources fails to understand the economic costs of environmental degradation (2017). The degradation of the Karoo veld, as I show, has ecological and economic consequences, moreover it indicates how the short-term vision of economic growth, fails to take into account the time it takes to regenerate environmental damage. In the Karoo, this may take well over 60 years (Wiegard and Milton, 1996).

[14] The image of the crater evokes the social, political and economic imagination of deserts as desolate wastelands with little value (economic) except as sites for nuclear testing, military operations and resource exploitation. Similarly, in recent years the Karoo landscape has come under significant threat with plans to explore shale gas extraction (fracking) and uranium mining (See Green, 2014).

[15] The Khoekhoen were transhumant pastoralist herders who, before the arrival of Europeans, have occupied southern Africa for at least two millennia (see Sadr, 2008).

[16] I met Sue in Prince Albert. Sue has worked on vegetation restoration in the Karoo for 40 years. She took me on a field tour of her rehabilitation site, Wolwekraal Nature Reserve, a small protected area just outside of Prince Albert.

likely a “lammerkraal”[17], an enclosure used to kraal the lambs of the indigenous fat-tailed sheep at night, so that they could milk the ewes in the morning and return the lambs afterwards. It may have been more than 300 years ago that they settled here with their livestock and yet, as we experienced, they continued to haunt the landscape as the vestiges of the past remained present like a reminder of layers of past life in the Karoo, or a “memory” as Sue described it. These memories are everywhere in the Karoo, and farmers pointed them out to me too.

[17] Afrikaans for lamb kraal.

Figure 2: The round plant-less indented lammerkraal site that is suspected to have been inhabited more than 300 years ago.

Figure 3: Taken on the side of the R61 where there are blankets of plant-less exposed soil.

On Angus's farm there were several kraal sites. One area in particular, called "oukraal" [old kraal], was difficult to see, since the service road of the railway built in the 1870's, which wove Graaff Rienet firmly into the colonial era of trade, economic growth, and ecological destruction, intersected and disrupted a more clearly demarcated round area resembling a kraal. Angus and I also drove through the oukraal, pushing and pulling the soil in many ways. This would have been a "tak kraal" [branch kraal], "they would take a doring tak [thorn branch] and slat [hit] it in, and another tak, and another, and then they make a hedge out of the takke [branches], literally just thick thorns, and then they would take another tak and drag it over the front" Angus explained, referencing the acacia trees that were still predominant in the area[18]. Angus and I both picked up a chunk of soil that was uncharacteristically dark and dense. Holding the soil to his nose, Angus expressed that when it was wet you could still smell the old urine and the old dung deposited, layered and compacted a few centuries ago. The memory was most clearly present in the soil of the landscape because it was "permanently damaged" (Angus) and the memory of this damage was present not so much in what was there, but what was no longer there. These sites preserved the memories of past lives, where the settling and trampling of the sheep, night after night, along with their human companions, transformed pockets of liveable soils to desolate and bare soils that no longer fostered the conditions necessary for plant life to establish, even a few centuries later.

I start with these two sites, as an important introduction to this chapter, for two reasons. First, because they tell us about a place where humans, soils, plants, trees, rocks, animals and other nonhumans have been entangled for a very long time. For Sue, rehabilitating the kraal was something she could not dream of doing, because she felt that, culturally, it was too important. Now, the kraal on Sue's conservation and rehabilitation reserve is an area for tourists to understand the multiple intersecting histories becoming "ghostly forms" and evident "traces of past life" (Mathews, 2017:G145). The kraal on Angus's farm tells multiple intersecting stories too. It tells us about the first people who roamed that land with their sheep and who lived according to nomadic land care practices making kraals out of branches and leaving worked stone behind. More recently it tells us about the rush of the colonial incursion and the accompanying trade routes into the area that fixed permanent settlement and allowed for economic prosperity. Today, with the railway closed, the oukraal forms part of the larger everydayness of productive sheep farming and we drive with ease through the kraal to get from one part of the farm to another. These abandoned kraals required me to pay attention to them as they

[18] Interview with Angus in 2018.

opened up "the partial and historical relations between plants, animals, soils, and politics" (Mathews, 2017:G146). In his work on walking in the pine and chestnut forests of Monti Pisani, Mathews bears witness to the ways in which past histories might have produced the particular shapes that we now encounter when walking and sensing within landscapes (ibid.). In the Karoo, round kraals were a way for me to begin to notice the "features of a complex plant-landscape assemblage" (Mathews, 2017:G148) that bore the visible markers of past human life into the environment, which leads us to another important story that these "ghostly forms" tell.

The second reason for thinking with the kraal sites, is to begin to understand how they serve as a powerful picture of the extent of the impact of ecological degradation in the Karoo and the sense of timelessness and "slow life" (Hickley-Moody, 2015:111) that comes with attempts to rehabilitate the Karoo.

> Sue: "One thing about working in the Karoo is that you see time differently. Everything is very slow, it takes a long time to grow, it lives a long time, and it decays very slowly"[19]

Sue explained this to me whilst we stood in the kraal on Wolwekraal nature reserve. Her explanation was evident, since the intervening three or more centuries since the kraal sites were occupied they remained plant-less or permanently damaged as Angus described it. To Sue, this invoked a sense of deep time, because in the Karoo the extinction of "so many species […] all in the name of progress", "doesn't disappear, it's right here like the day they left it" (Sue). Therefore, they tell us about the ecology of the Karoo and the sensitivity and care that is required in relationships of the living between the humans and nonhumans that occupy that landscape. However, these kraals are only small indications of a much larger story of degradation. One that began with colonial expansion inland and the advent of modern technologies and claims to private property that attempted to conform the Karoo veld to a logic of endless extraction for capital gains at the mouths of sheep and at the expense of other animals, plants, seeds and soils. This is the story I would like to stick with, since it is this story that has severely cheapened the Karoo veld and caused widespread degradation of the Karoo. Moore (2000) writes about how capitalism's political economy relies on "Cheap Nature" in a double sense of "Nature is 'cheap' in price", as well as cheapened in its disregard and subsequent degradation (2000:3). However, the cheapening of nature must come to an end, writes Moore. Similarly, Shiva

[19] Conversation with Sue in March 2018.

(2009) has argued that the degradation of environments across the world is making it an "ecological imperative" to find a different pathways – a paradigm shift – that refrains from cheapening the natural reserves of the planet. In the Karoo, the kraal sites are small pockets, but they tell us about what degradation in the Karoo might look like. My interest for this research, however, is not so much to tell of the destruction of these round craters where no plants could live, but to speak of the larger blankets of degraded soil (see figure 3) that have urged farmers to pay attention to the ecological well-being of the Karoo. To introduce this chapter with the picture of the kraal is a way to begin to envisage the kind of delicate ecological subtleties that make paying attention to the Karoo veld critical for the ongoing survival of humans and nonhumans alike. However, "if we want to nurture landscapes in which humans and other species augment each other's survival", argues Tsing et al., "we will need appreciation of such discrepant multispecies rhythms" (2017:G143). This is a requirement I will return to throughout this ethnographic enquiry. These are the questions that farmers in the Karoo considered in their own work, since their work takes place in a context where livability is constantly at stake.

Working with a Karoo patchiness is the stuff of survival

Let me stick with stories of degradation. If you pay attention, the degradation of the Karoo veld is everywhere around you. Often, whilst I was driving in the Karoo, the fenced in veld lining the roads would disappear as sweeps of plant-less areas foregrounded the panic of a desertifying Karoo veld. These are the landscapes that matter. The increased desertification[20] of the Karoo has been an alluring question for academics (Dean et al., 1995; Hoffman et al., 1995; Roux and Vorster, 1985), farmers and inhabitants of the Karoo alike. At times during my fieldwork, I felt the sense of panic after passing these vast flattened areas with little or no plant life whilst the soil resembled powdery desert-like imaginaries. Thoughts of a desertifying Karoo is not novel. Inhabitants of the Karoo would often start their own experience of environmental change in the Karoo as "there used to be rain in this region for up to three weeks, a soft extended rainfall" or "in all my life this river has never dried up", or "there are areas where the Karoo veld has turned into sand dunes".

[20] Whether the Karoo is desertifying remains ambiguous and the causes of desertification remains under debate. John Acocks (1953) has made a lasting impact on the argument that the Karoo is desertifying, arguing that in time overgrazing the veld in the Karoo will cause the productive grassland to be replaced by unproductive shrubby Karoo vegetation. However, many scholars have disagreed, arguing that it is difficult to distinguish between the effects of overstocking vs. drought on ecosystem shifts (see Hoffman et al., 1995).

The anthropogenic environmental changes in the landscape, as told by the living memories of the Karoo, were present in the stories of every farm I visited. These stories have become very recognisable in the Anthropocene where the lived realities and observations of warmer summers, indifferent or less rain, less snow, more trees and shrubs, and the "most intense drought in living memory"(Anton)[21] situates the Karoo firmly within our time of global anthropogenic climate change. It is Global, because as Tsing argues, "you cannot 'do' climate change in just one place" and yet "none of us live in global systems; we live in places" (2016:3). "The ideology is global and the enactment is local" writes Tsing (ibid.). When "we experience livability through these places", we start to notice how the "Anthropocene is patchy" because it is composed of "varied assemblages of livability" (Tsing, 2016:4). The patchiness of livability in the Karoo is multiple, perspectival, and partial. Fence lines were often the most visible and literal markers of the patchy Karoo landscape, and I shall return to them throughout this thesis. What they held inside of them were the remnants of past land care practices that accompanied the arrival of colonial men, who shifted and altered the Karoo veld and who have since threatened livability in the Karoo. It is these histories, both global and local, that have shaped the stories of patchiness on every farm I visited. It is also these histories that now summoned the farmers I spoke with, to understand part of their work as a kind of reclaiming of what was dispossessed before them, often by their great-grandparents, grandparents, or parents. These stories are about the ecological localities (and specificities) of the Karoo as experienced on the farms I visited, and by the inhabitants of the Karoo who showed them to me.

Degradation in the Karoo tells us about the past, and in order to see the present more clearly, farmers had to look at the past. This is especially pertinent in the Karoo, where degradation from the past compromised any possibilities of life in the future. Therefore, when Peter introduced me to what he does for a living he described it as "healing the veld" – "we had to look at healing the veld", he explained, "to give us more grazing, because we couldn't have survived the way we were going"[22]. Peter could not have survived because the veld on his farm was so degraded that he had to drive in feed to keep the sheep alive. Peter showed me the difference between the veld then and now, because he had collected a personal archive of photographs documenting the change[23]. Old photos dating back

[21] Interview with Anton in March 2018.
[22] Interview with Peter in March 2018.
[23] One photo in particular shows Peter's son placing lucerne bales on the bare patches of soil (see figure 4) to encourage the domestic animals, sheep and cattle, to disturb the bare soil which is believed to encourage future growth. The photo below this shows the disturbed soil. See chapter three and four for a detailed description of this land care practice.

to 1982 showed large patches of the soil exposed and plant-less, much like those I saw on the side of the road. These were the obvious markers of environmental degradation in the Karoo, along with the plant-less rivers of erosion. The more subtle ones were the shifts in vegetation, from one area to another. These subtle shifts are present in the absence or lack of plant varieties (usually grass/palatable varieties) from one camp to another and fence lines were the way that farmers showed them to me.

Figure 4: The archive of photos that Peter has collected to document the changes in vegetation cover of the veld since he began efforts of active rehabilitation.

Indicators of such environmental degradations in the Karoo have, for the most part, been discussed in terms of vegetation change (Seymour and Dean, 1999:267; Acocks, 1975). Changes include the thinning of vegetation, biodiversity loss and the relationship and ration between plant species (most notably grasses and shrubs). Debates around the cause of environmental degradation in the Karoo is centred around whether these observed ecosystem shifts should be attributed to "weather or to grazing domestic livestock" (Seymour and Dean, 1999:268). Extreme climatic fluctuations in semi-arid

regions, like the Karoo, make it difficult to distinguish whether environment degradation is a result of the Anthropos or the Geos (ibid.). Whilst short-term and seasonal fluctuations in grass and shrub cover is widely recognised (Dean et al., 1995), it is also widely accepted that "heavy grazing does threaten biodiversity" (Seymour and Dean, 1999:268). These disruptions, when looked at from an agricultural point of view, are often notable in the ration of species, whereby the increase in the 'undesirable' and unpalatable Karoo bush (woody species) or "bitter" bush at the expense of perennial and palatable "sweet" grasses, has decreased the grazing capacity of the Karoo (Roux and Vorster, 1983:25; Acocks, 1975). The lowering of stock numbers since the early 1900's is thought to reflect this degradation (Dean and Macdonald, 1994)[24], with lowering carrying capacity of the veld being a result of the depletion of the Karoo veld by the extended and constant periods of grazing livestock. This is because when palatable species were continuously grazed without any opportunity to produce seed, their reproductive potential decreased, and so too did their presence in the landscape, whilst unpalatable plant species have proliferated.

The changes in the species mix of plants in the Karoo have social consequences for both humans and nonhumans alike. For nonhumans, it halted and shifted flourishing multispecies interdependencies, including those between plants, soils, roots, and animals. For humans, these consequences were economic. What they had to learn, as Peter expressed in his sentiments of healing the veld, was that their (economic) survival depends entirely on the ongoing liveliness of the veld. The goal of regeneration in the Karoo for farmers, as I had to learn, was not always romantic, but it was necessary in a context where "ongoingness is at stake" (Haraway, 2015:160). Survival, as Tsing (2013) argues, "always involves others", and in the Karoo, the veld demanded farmers to collaborate if indeed they wished to continue to make life in the Karoo. What does this tell us about the conditions of generating life in the Karoo?

Sue answered the question of the necessary conditions for survival simply, but powerfully: "You can replace your livestock, but not your veld". This message was important in the context of the Karoo – a semi-arid region – where the time of regeneration (and decay) of the ecological assemblages in the landscape is slow and ambiguous, and where the ecological assemblages provide pasturage to livestock — the same livestock that allows farmers to prosper economically. Michael understood this

[24] The overall decrease in stock numbers in the Karoo since the 1990's according to Dean and Macdonald, is due to a drop in carrying capacity and the productivity of the veld. This is thought to be a result of veld degradation (1994).

rule and to him it meant: "You can play with the numbers of your sheep, or with your livestock, but you can never play with your veld". It was also this message that eventually led me to understand what Martin meant when he explained that he farms with seed, not sheep, a discussion I return to later in the chapter. These ways of relating opens up the complex interplay between economy and ecology and it begins to make a case for the "oikological" (Green, 2014:10) life making projects on farms.

OIKOS: unruly liveliness in the midst of ruin

The overgrazing of parts of the Karoo veld since the 1800's is something that the farmers all knew about. It was this past that has informed their present ways of reimagining their land care practices, which they believed would ensure the ongoing livability of the Karoo veld for future generations. This ongoingness was oikological; it was both economic and ecological. Both ecology and economy find their etymological roots in the Greek word "oikos" meaning "house". Eco/logy is the study of the "house of nature" and the interrelations between its living and non-living of which humans are a part. Eco/nomy is the management of the "house of humans" and specifically the production and distribution of wealth (Naveh, 2000:357). In academic paradigms ecology and economy have seldomly been integrated, since academic silos have separated natural science from social science. Yet, as Naveh argues, "the current climate crisis shows clearly that it is not possible to efficiently manage the house of humans whilst neglecting the house of nature" (2000:357). Rather, what landscapes, like the Karoo, have begun to show us is that the problematic modernist ontology that separates "society" from "nature" was never, and is no longer useful, since neither "Nature without humans" nor "Society without nature" is anywhere to be found (Moore, 2016:2). We are now playing, working, and worlding in the Anthropocene, where we have "played the role of planetary killer, concerned only with [our] own short-term survival" (Wilson in Chakrabarty, 2008:206). The patches of lifeless soils that introduce this chapter tell us about this. Yet, as I show, today a "reparative oikologics" whereby "a way of thinking about ecology, economy, ecumene jointly" (Green, 2014:13) become the work of worlding liveliness in the Karoo, since the possibilities of economic survival depends entirely on the ongoingness of the ecologically sensitive veld.

To speak about the conditions of living in the Karoo, I must therefore begin by leading the Karoo veld, following the work of Tsing (2013) on mushroom forests, into the foray of "anti-plantations". Plantations, as Tsing and other have suggested, did the work of transforming ecologies into something entirely different, whereby "plants and animals are abstracted in order to become resources that can

be used for investment" (Haraway et al., 2016:556). Tsing's notion of "scalability", the "ability of a project to change scales smoothly without any change in project frames" both as a knowledge making tool, but also an outcome of "Progress" (2013:38), is useful for thinking about the degradation of the Karoo veld and the blankets of lifelessness that it encourages. Unlike the work of the plantations of colonial incursions[1] and their scalable features, whereby the reproduction of the same was actioned whilst turning living multispecies ecosystems into monocrops, the Karoo "cannot live without transformative relations [between] species" (Tsing, 2015:37-40). Therefore, the Karoo veld posed a problem for the attempts of the colonial work of endless capitalist extraction and the making of popular configurations of "plantations" that turn landscapes into predictable sets of domestication. This is a discussion I elaborate on in chapter four.

To envisage the Karoo as an anti-plantation is useful, because (as farmers have come to learn) the abstraction of the Karoo veld as merely a resource for economic extraction has caused long term ecological consequences. This problem is evident in the stories of vegetative degradation outlined above and once the veld is degraded, possibilities of regeneration are uncertain. Jan, a 94-year-old retired farmer and friend of Sue, was distressed by the state of the Karoo veld. He was also distressed at the thought that farmers were "vernielers" [destroyers] of the soil. He did give a rough estimate of the amount of years conscious efforts of rehabilitation may take somewhere around 40 years, to which he said he added "partially". If the barren kraals were anything to go on, this number might have been liberal – but it also indicated that generating liveliness after destruction in the Karoo was slow, ambiguous and precarious. If a patch of soil in the Karoo found itself plant-less it makes it very difficult for plants ever to establish on it, since most of the seed in the Karoo is windborne seed, and if there is nothing to trap the seed, they will keep on travelling[25]. Moreover, some seed can move 20 km a year, and others only 2 km, making it difficult for seedbanks to replenish after being depleted from years of overgrazing. Bare soils are the death of the Karoo – the ecological and economic death. They let the water run fast and without care, since like the seeds, there is nothing to capture the water, and the soil runs with the water – leaving roots bare and, exposed and threatened by bigger sweeps of erosion. These kinds of conditions of life were everywhere, and farmers had to learn from them if they wished to imagine a future in the Karoo. As James, Peter's son, and a farmer in Graaff Reinet, explained: "If you're a young farmer today and you don't change [your land care practices] you're

[25] Sue explained this to me. Sue also showed me how the time of rehabilitation is slow in that the rehabilitation trails, where small shallow holes where dug eight years ago to initiate the trapping of seed and the subsequent growth thereof, continue to have little plant growth on it.

dead. You want to get rid of bush and have more grass, because grass gives you carrying capacity. More animals, more money, more animals, the better the veld will respond."[26] These were the lessons of liveliness that farmers in the Karoo had to learn.

Lesson 1: Seed as potential for future life

Low precipitation rates in the Karoo, make it favourable as rangelands for both livestock and game (Taiton in Smet and Ward, 2005:59). The farmers I spoke to were all farming with an assortment of livestock, including sheep, goats and cattle[27]. Yet, when Martin introduced me to his farming philosophy, I was curious as to how it was that Martin, a goat and sheep farmer, had come to understand himself as farming with bossies (bush) and seed.

> Martin: "Ek het nou gesê mens boer eintlik met bossies, maar [my pa] het gesê, eintlik boer jy met saad - dit is die ultimate." [I've said that you actually farm with bush, but my dad used to say, in fact, you farm with seed.]

For Martin, bushes and seeds are shorthand for the community of plants that make up the Karoo veld and it is this vegetation that feeds his domestic livestock. The Prince Albert district is a region that has an annual rain fall of a meagre 200mm, it is also region that is prone to drought. Seed was central to Martin's narrative of generating liveliness in the Karoo, precisely because it was seed that held the potential for life after extended periods of no/little rain. Seed could "give grazing after drought" even if all the bushes had died. Part of Martin's work was to ensure that he preserved the "seed bank" on his farm. The way he did this was through a meticulous and calculated rotational grazing system. This ensured that his livestock did not continuously graze on the palatable vegetative components of the veld, which would in turn diminish the potential of those plants to generate seed. To Martin, this is a "subtle way of protecting and enabling nature to produce seed". Whilst a significant amount of literature has sought to look at the impact of decades of overgrazing in the Karoo on diminished seed banks and therefore also a diminished potential for life when the rain falls again, Martin had learned these lessons with a deep attunement to the subtle but vital conditions of living in the Karoo.

[26] Interview with James in March 2018.

[27] Cattle were more prevalent in higher rainfall areas, such as Graaff Reinet, where there is a higher carrying capacity.

When Martin stopped his bakkie, often to show me the patches of seedlings tightly packed on the floor of the Karoo, he was showing me the seeds that would usually lie invisible on and in the soil. These seedlings emerged after the last bit of significant rain, a month before my arrival on the farm. If they would receive more follow up rain they may be able to establish a large enough root system to carry them through sparse and unpredictable rain-less periods, but their future was still uncertain. In the Karoo, understanding these relational ontologies is the stuff of survival. These seeds, and these seedlings, would become the bushes and grasses, and ultimately the veld, that provides pasturage for the livestock that economically supported Martin. As Martin explained:

> Martin: "74% van Suid Afrika is aried. Droog. So, die enigste manier wat jy kan leef is deur bossies in diere, in proteïne te kan omsit" [74% of South Africa is arid. Dry. So, the only way to make life is to convert bushes into animals, or proteins.]

The veld was the grass, the bush, the seed and therefore also the soil from which these emerge and make life, the veld is however, also the sheep who eat and make life there.

Lesson 2: Flesh is grass

Whilst Martin stopped to show me the small seedlings that were establishing on his farm, Peter stopped to show me the varieties of grass. Peter would stand next to the road, pointing them out: one, two, three, four, five, up to ten or sometimes twelve different varieties. Grass was Peter's pride. Stories of farming in the Karoo were often centred around vegetation, but grass was the species that farmers were most excited to show me. It was the thing that many of them did not have before, and that some of them were now beginning to see in abundance. I never thought much about grass in the Karoo. Yet, farmers beamed at the sight of grass on the farm. This is what gave Peter a "thrill" when he saw the "response" of the vegetation to his rotational grazing plan. The response was an increase in plant varieties, and especially grass varieties. For Peter, grass was the indicator that his veld was busy "healing". It starts with pioneer grasses, and then it moves onto climax varieties. Whilst climax varieties are the "good stuff" because they are more palatable, pioneer species are good too, because they hold the soil[28].

[28] Grass is important because it can provide food to the livestock. It is also important because it holds the soil when the rain falls and prevents the probability of erosion. Moreover, grass and good ground cover allows rain water to be absorbed into the soil, rather than "running off".

When Peter started farming in the late 1970's there was almost no grass on his farm. Instead the veld comprised of an abundance of kriebos (Lycium arenicolum), which was now (40 years later) giving way to the pressure of the increased grass varieties that "throttles the plant" (Peter). Milton and Hoffman (1994) have explained how grasses, being taller with more extensive root systems, can outcompete dwarf shrubs for light and moisture (Hoffman et al., 1995:162). This is what Peter was seeing, and this is what he was hoping for.

Caroline[29] had only recently started farming on her farm, not far outside of Graaff Reinet. Caroline was the first farmer to point out the multiple intersectional relationships with grass. Those that were both ecological and economic. Since taking over the farm, Caroline had turned the farm from 5 large camps to over 100 small camps. This change was to ensure that her cattle never grazed any patch of land for longer than a day or two. Whilst we were driving from camp to camp opening the many gates along the way, Caroline was notably excited by the "fuzz" that was everywhere around us. Before this time, the farm hardly had any grass, but she was now experiencing the rise of a variety of pioneer grasses, and the odd climax grass too, which she described as the fuzz. This fuzz was beginning to occur because she had started practicing rotational grazing[30]. The bunched-up movement of livestock, according to farmers, ensured that their hoof action would disturb the soil whilst making it favourable for the germination of a larger variety of plants, especially grasses. Fuzzyness is the work of regeneration in the Karoo. It does the work of keeping the soil, slowing down the water, and feeding the livestock that, in turn, makes money in the Karoo.

Why the emphasis on grass? I wondered about this, but then Michael pointed it out quite literally to me:

> Michael: "More grass, more cattle, more cattle, more money […] Why do we have a multi-camp system … more grass, more cattle, more money – to put it simply."

Instone (2014), writing on the ecological restoration, explores how certain cultural dimensions permeate preferences about nature, in that one kind of nature becomes valued above another (2015:57-58). In the Karoo, I had never understood the importance of grass. To me, the veld was a nostalgia of beauty – a view that I could play and walk amongst. Yet, farmers saw and hoped for

[29] Interview with Caroline in April 2018.
[30] This is a carefully controlled time management system that constantly moves the livestock to ensure they do not overgraze any piece of the land.

grass, because the veld and all its plant varieties fed their livestock. For a livestock farmer, the veld is food, and food is the flesh that then is sold for money. “All flesh is grass” it reads in Isaiah 40 verse 6, and in the Karoo, this law of liveliness is everywhere. I was not able to meet Anton on his farm, but he explained the law of liveliness to me by describing how there is no grass on the 30km stretch before arriving on his farm, but once you arrive at his boundary fence there is grass as far as you can see. Moreover, driving along the road you see “thin miserable cattle” and then when you “get to [his] boundary you see fat happy cattle and lots of it” and “that’s just money” (Anton). This is something Anton was cautious of saying because he did not want to disrespect his neighbours, but it was also the best way that he could explain to me, whilst providing his own ‘evidence’ of how the work of ecological regeneration brought about economic well-being. This was quite literal, as Michael explained above. Grass and the increase of plant varieties also increased the carrying capacity of farms, meaning that farmers could carry more animals than they had previously, because grass is palatable, and even when dry, it stores energy which can continue to provide fodder to the livestock, unlike bushes that drop their leaves when they dry up.

Increasing the variety of plants on the farm was also important because it allowed livestock to eat a variety of plants, and keep their plane of nutrition high. Caroline explained that she wanted different types of grasses because: “I want the cattle to be able to say, oh I’ll have a bit of that today, and a bit of that tomorrow." Ensuring that your animals were exposed to a varied diet, whilst constantly being moved to keep their nutrition at optimum, was important, because farmers did not want to stress their animals, because if you stress your animals “your production goes straight through the floor” as Michael explained. This is because sheep on a high plane of nutrition could conceive, reproduce, and care for their young, and these were the things that brought economic prosperity. So, you “keep the [re]productive capacity at its highest through good nutrition” and good nutrition needed farmers to foster a thriving multispecies and an ecologically diverse veld.

The degradation of the Karoo veld that accompanied the onset of commercial sheep farming left, in it’s wake, the blankets of lifeless soil that introduced this chapter. Richard, an ornithologist who has been working in the Karoo for over 40 years, explained to me that the colonial men, then, “thought that the land was more productive than it actually is”. However, “the ecologies of arid lands are more sensitive to detrimental change” (Roux and Vorster, 1983:25) and whilst it took the new inhabitants of the Karoo a while to notice, their intergenerational responsibility to “reclaim what their forefather

decimated" as Peter described it, has been cause for a revival of the work of reparation oikologics. What they had to learn was that if they wished to continue to make life in the Karoo, they needed to be aware of the impact of humans on the planet livability, and they needed to ask, as Tsing has, "how much chance do we have for passing a habitable environment to our multispecies descendants?" [31] (2015:3). They needed to ask this, because, as this chapter has showcased, their economic survival depends entirely on the ongoing multispecies assemblages of which humans form a part of.

In conclusion, the patches of degraded veld, as I have shown, are not only indicative of the ecological consequences of earlier economic extraction, but today the economic survival of farmers depends on the liveliness of these ecologies. This is because sheep do not only graze on the veld, they are the veld – if there is no veld there are no sheep. This has led the farmers, with whom I conducted this research, to understand their work as more than that of a livestock farmer. Rather, they saw their work as deeply engaged in the renewal and regeneration of the Karoo landscape – where paying attention to the soils that hold seeds, to the seeds that become the veld, to the grass that holds the energy that feeds the livestock and slows the flow of water, and finally, that in order to survive, farmers are entirely dependent on these relationalities. These life-making projects, as this chapter has unfolded, did not exclude the economic incentives that drove the colonial incursion into the abandoned and desolate Karoo. Rather, these economic incentives were now grounds for restoring the veld. This chapter has shown how farmers in the Karoo are attuned to a reparative oikologics, whereby economic prosperity and ecological well-being, together, produce the conditions of life on Karoo rangelands. This has demanded farmers to bear witness to the ways in which humans and nature together produce the conditions of liveliness. Drawing on this, the following chapter explores the making of economies/ecologies of the Karoo by looking at work of infrastructures and technologies. It considers the relational ontologies that order these infrastructures into a variety of life and death making practices.

[31] Farmers often asked this question. It was particularly pertinent for them, since most of them planned to leave their farms to their own children.

CHAPTER 3

Looking Over the Fence: On Infrastructures, Ontology, and a Quest for Bringing Back 'Nature'

Stories of human disturbance to the natural world are everywhere around us. Tsing (2013) has urged us to use these stories of contamination in order to understand how we might come to know and recompose the common world. These are the stories of "survival in histories of greed, violence, and environmental destruction" (Tsing, 2015:33). "Contaminated diversity" is the phrase used by Tsing to talk about the "collaborative adaption to human-disturbed ecosystems" that are always changing and always relational (Tsing, 2012b:95). The stories of contaminated diversity are the stories of disturbance, but they are also stories of emergence. In the context of the Karoo, where sentiments of progress and development have deteriorated, disrupted and disturbed the ecological wellbeing, questions of earthly togetherness are pertinent to the future survival of the Karoo and all its inhabitants, whether human or nonhuman. An earthly togetherness, as this chapter will show, asks about the conditions of Karoo liveliness and the multiple and multispecies relations that allow that to happen (see van Dooren and Rose, 2016). This chapter is interested in exploring the rise of infrastructural development as an expression of contaminated diversity. It will focus on fencing as an ontological practice of regenerating the Karoo veld. This is a contentious point of entry into attempting to answer questions of the conditions of generating a liveable Karoo, since the introduction of fencing into the Karoo has, for the most part, been discussed as being responsible (in part) for the degradation of the Karoo landscape (Archer, 2000; Roche, 2008). These discussions trace past economic, social, political, cultural and technological relationships, that have reconfigured the 'natural environment' of the Karoo into a landscape that haunts with the uncertainty of future life.

Since the end of the 19th century there has been significant concern around the anthropogenic degradation of the Karoo landscape (Shaw, 1875). Much of this work of destruction has been because of the reorientation of the Karoo landscape from shifty spontaneous movements across the landscape closely engaged in multispecies livingness, towards fixed capitalist livestock production. The enclosure of the landscape by its human masters has seen the work of human barriers disrupt the ecological wellbeing of the Karoo veld. Yet, the unfolding of the nonhuman world has demanded that we notice the work of infrastructural development on their liveliness. Tsing et al., (2017) beckons us to pay attention to the ways landscapes are "haunted by past ways of life" (2017: G2) and in the

Karoo, fence-lines demand us to pay attention to these past ways of life. We might then ask, what do fences do? In the Karoo, the answer to this question, as farmers have pointed out, depends entirely on the practices in which they are manipulated. Thus, whilst infrastructures, including fencing, have been a technological marker of destroying multispecies liveliness today, when used differently, they have become a way to reassemble the conditions for reclaiming 'nature'.

Infrastructures: Windmills, fencing and the relationships of life and death

To begin this chapter I will highlight two ethnographic details that introduce the work of infrastructural development in the Karoo since the mid to late 19th century.

Noticing windmills:

It was another hot April morning in the Karoo. The dampened soil from the spurt of rain the night before had already dried by the time Martin and I were driving into the veld. Our second stop was at one of the 62 windmills on Martin's farm, where we stood under the cranky but well-maintained windmill. The wind was blowing, only ever so slightly, but enough to allow the windmill to move slowly in many ways. First it follows the direction of the wind, the tailbone changing to position the multiple radiating blades to face the wind. These blades, slightly curved like metal sails and radiating outwards catch the wind and turn, producing the circular motion associated with the many windmills that dominate the Karoo horizon. Finally, the shaft that extends into the earth and into the aquifers, slides up and down, moved by the velocity generated by the rotating blades. It is this shaft that slowly pumps up the water that Martin and I marvel at as it pours sporadically and slowly into the reinforced concrete dam that itself gathers multiple living organisms. As we lean over the wall of the cement dam and look into the water, Martin remarks:

> Martin: "Die water is lewe! As daar nie 'n windpomp hier was nie, dan was daar ook nie lewe nie." [The water is life! If there was no windmill here, there would also be no life.]

For Martin, a merino sheep and angora goat farmer in the Karoo, the windmill and the water it pumps allows him to practice fixed pastoralism in fenced off camps. Windmills have become a sentiment for sustaining life in an area where rainfall is inconsistent and little. However, the windmill is also the infrastructure that instigated the change in farming practices that has severely compromised the future liveliness of the Karoo veld and the multiple species that together make their life here. Martin's

remark forms the ethnographic entry point for a discussion on the introduction of infrastructures in the Karoo, and the multiple and, at times, seemingly conflicting and complex material and ideological work of infrastructures (see Harvey and Knox, 2012). It introduces the concern of this chapter: that when objects are understood as things manipulated in practice then "reality multiplies" (Mol, 2002:5).

Figure 5: Windmill on Martin's farm, with cement dam below.

Noticing Fences:

On my first day of fieldwork I drove on the N1, the national highway that connects Cape Town to Johannesburg, passing through Prince Albert, a small town situated in the Nama Karoo at the foot of the Swartberg mountain. Whilst driving I noticed a steenbuck[32] running towards me, as if trapped on the road verge, the small strip of land between the road and the fence which foregrounds the vast Karoo veld extending both to the left and the right of the highway. The steenbuck was looking towards

[32] The steenbuck is a small antelope that is common in semi-arid regions, like the Karoo (Furstenburg, 2005)

the fence, or maybe the other side of the fence, as if hoping to find a gap to once again return to the Karoo veld, to where it makes its living. However, now it will most likely be killed either by a car or passer-by seizing the opportunity to hunt for their next meal. Seeing the steenbuck made me notice the fencing that has become so commonplace in the Karoo, so much so, that I no longer acknowledged its presence. As much as this is a story about one steenbuck trapped on the road verge between two fences and a major highway, it is also a story that foregrounds the relational ontologies that begin to answer the question of what do fences do? To ask that question I must again ask what this encounter on the side of the highway along one of the many fences that designates this landscape tells us about the relationship between infrastructures and the other-than-human as well as human encounters that they unfold. To do so, I must first return to the end of the 19th century and the beginning of the 20th century and the colonial move inland, which was also the beginning of the reorientation of the Karoo into a landscape that is static and haunting with *want* for past ways of life.

Before this time the Karoo had, for the most part, been occupied by nomadic human and nonhuman life arrangements (Talbut in Dean et al., 1995). At first, the colonial incursion towards the interior of South Africa was slow whilst imitating more nomadic and fluid practices of livestock grazing – the kind of transhumance[33] grazing that the first people of Southern Africa would have practiced as they moved with their livestock searching for favourable conditions for maintaining life, both for themselves and their fat-tailed indigenous sheep (Guelke and Shell, 1992:809). However, after the 1850s, white colonial farmers began to settle more permanently in the Karoo and livestock numbers began escalating (ibid.). It was the introduction of the modern windmill in the early 20th century that allowed for the expansion of colonial man into the Karoo. Accompanying them was a radical shift in practices of landscape making, which has since caused concern and ongoing debate about the impact of their livestock grazing and thus the extent of human influence on the destruction of the landscape and ecologies of the Karoo (Roche, 2008:160).

The introduction of modern windmill technologies into the Karoo allowed people to settle and make life in areas of the Karoo that had previously been uninhabitable. The infrastructures settled farmers and provided the necessary conditions for practices of permanent pastoralism, and accompanying the windmill technologies was the enclosure of what was previously a seasonally utilised landscape into

[33] Transhumance is the practice of moving livestock from one grazing ground to another, usually this occurs according to a seasonal cycle, typically to lowlands in winder and highlands in summer (see Oxford dictionary, n.d)

cuts of private property (Roche, 2008:174, van Sittert, 2002). This saw the flows of natural phenomena, including soils, seeds and animals bounded by the ideas and material application of private pockets of land ownership. The Karoo was divided into private farms, which were then internally divided into camps. These infrastructural changes lead to the decline of herding and kraaling sheep at night and instead allowed sheep to graze 'freely' within the confines of fenced off camps (Archer, 2000:675; Roche, 2008:184). After this time, sheep practices that used to imitate the movements of wild game herds were designated to the private cuts of land enclosed in fences. The sheep could now graze permanently on the vegetation whilst having access to artificial water points (ibid., Esler, et al., 2006). These changes in farming practices also allowed for a dramatic increase in livestock numbers (Acocks, 1953), which by the mid 19th century complimented the demands instigated by a growing urbanising population in the Northern Karoo. This was, in part, due to the colonial surge North following the discovery of diamond-bearing rock, and within a few years of the diamond mines opening, sheep prices had doubled (Archer, 2000:683). At this time rangelands in the Karoo were already beginning to show signs of progressive degradation (Shaw in Dean et al.,1995).

The belief then was that the fencing in of sheep and the supply of artificial water sources would "increase productiveness", "enable you to raise more stock" and "save in the amount of shepherds needed" (Archer, 2000:686). Furthermore, it was believed that fencing "checks thieving, and civilized the country, as there can be nothing worth calling a farm until the country is fenced and the farmer has his stock thoroughly under *control*" (Department of Agriculture, 1896 in Archer, 2000: 686). From 1912, the Fencing Act encouraged farmers to fence their property, and later an amendment to this act encouraged farmers to implement jackal proof fencing by providing farmers with loans (Nattrass and Conradie, 2013:6; van Sittert, 1998:351). Fences promised economic emancipation as a technology of modernity (Harvey and Knox, 2012:523). Whilst the controlling of livestock in large fenced off camps did allow farmers to raise more sheep, it was not for long. My uncle Charlie[34], a third generation Karoo farmer who farms about 50 km outside of Beaufort West explained it as follows:

> Charlie: "Let me put it to you this way, when Dubba [great-grandfather] was farming here on Klavervlei he was running 5000 sheep on 8 000 hectares, I now run 1500 sheep on 12 000 hectares."

[34] Conversation with Charlie in October 2017.

This familial comparison of sheep stock numbers between then and now, a few generations later, starts to uncover the impact of fencing and the accompanying land care practices which today have degraded the Karoo veld. It was a comparison that many farmers in the Karoo made. Martin also calculated the generational difference between him and his grandfather in livestock numbers. When I visited Martin, he was carrying around 1100 sheep on a total of 26 000ha, some of them on his farms and others on rented farms. His grandfather, as he remarked, had carried 10 000 sheep on the 7000ha family farm where he lived, just outside of Prince Albert. The reduction in carrying capacity and amount of sheep today, as compared to then, is believed to be a result of progressive degradation of the palatable component of the Karoo vegetation (Dean and Macdonald, 1994). This is believed to be because of overstocking and continuous grazing practices.

The economic impetus of sheep farming at the time of my great grandfather and Martin's grandfather was major. The wool boom between the 1920's and 1950's, driven by the increase demand for wool after World War I, and later the Korean War, saw farmers increase their technological infrastructures and further increase their sheep stocks (Archer, 2000:682). The increase in the export value of wool and mutton saw the implementation of state subsidies and the commercial farming of sheep as an important economic impetus. At the time, fencing and the rise of windmill technologies did increase productiveness. This allowed sheep farmers to prosper economically as well as fulfilling a major role for wider economic development (Nattrass and Conradie, 2015:4; Roche, 2008). The overgrazing of the Karoo veld was predicated on assumptions that the Karoo veld could continuously support large numbers of stock. However, the narrow focus on the economic gains of inflated sheep stocks were blinded to the interconnected lives that allowed Karoo bushes and grasses to survive. The same vegetation that the sheep ate and the farmers relied on.

A tunnel vision of this sort, where the desire for (economic) progress has come to define what it means to be human, whilst assigning nonhumans to the same imaginative framework, is failing (Tsing, 2015:21). Scott writes on the narrowing vision of human progress arguing that "it brings into sharp focus the certain limited aspects of an otherwise far more complex and unwieldy reality" (1998:11). In the Karoo, this 'reality' would take only a few generations to notice. The numbers that farmers cited above were to showcase the economic changes that they had experienced as compared to their earlier ancestors, but they were also indicative of another problem – an environmental one. These changes in numbers tell us that the Karoo veld was once, albeit briefly, able to carry vast

numbers of domestic animals, and so they tell us about the kind of vegetation cover that would have been able to feed these animals. They also tell us that it was short lived and that in the intervening century the Karoo veld has significantly reduced its ability to carry animals. Therefore, they tell us about the problem of a deteriorating Karoo veld that has been subjected to death and dying and much of this has been attributed to the "overstocking"[35] of the veld (Dean and Macdonald, 1994). Since this time, sheep have been animated as destroyers[36] of the veld in discussions of overstocking. Another story, perhaps one that is more pertinent to questions of ecological destruction in the Karoo, belongs to the practices of a kind of mastery that reimagined the Karoo landscape as fixed. The advent of fixed boundaries speaks to the colonial legacy that enshrined modernist technologies and private property that "offered the techniques necessary for colonial dispossession" (Green, 2016:3).

In the Karoo, these dispossessions are present in the landscape where the vegetation composition makes visible past relationships between the land, infrastructures, animals, soil, plants and humans. It was the farmers who first brought these relationships to my attention. According to them, the question of veld degradation was far more complex than the practice of overstocking of farms. Alongside these practices were the decimation of the conditions that fostered the multispecies assemblages that bound grazers (both domestic and wild), grasses, bushes, insects, birds, predators and soils in a landscape that generated co-dependent and flourishing ecosystems. The question of fencing and windmill technologies is therefore not only about the relations of living that it enabled and in turn traded for other-than-human relations of death, but it was also what the other-than-human livingness created beyond their human masters in a landscape fraught with precariousness. This has demanded farmers to recognise along with Tsing that "we are surrounded by many world making projects, human and nonhuman" (2013:21). I will therefore return to another change in landscape making that occurred alongside the infrastructural and economic development of the Karoo – the decimation of the trekbokke, that speaks to the multispecies lives that inhabited the Karoo before the colonial settlement.

[35] The overstocking of the veld has been at the forefront of discussions of land degradation in the Karoo. It was believed then that fencing in livestock would allow a higher stocking rate per unit of land, but this thinking neglected the "natural capital" of the land – the veld (Archer, 2000: 686,694).

[36] Chapter four of this thesis elaborates on this point.

Fences and the deadly encounters they encourage

Today fences foreground the vast expanding veld as a backdrop. Steenbuck, much like springbuck, and unlike kudu, do not usually jump over fences (Furstenberg, 2005:253). They might crawl underneath a fence if a warthog or porcupine has dug a hole, or go through a fence if the gap is larger than 100mm (ibid.), but their movement and paths are fatally hindered by fences. If we return back to the steenbuck I encountered along the N1 highway, we might start to uncover the social worlds that have been obliterated as the markers of private property infused landscape making in the Karoo. The story about the fate of the steenbuck I describe above, should be traced to a much larger story, one that ceased around 1896-7 (Roche, 2008). Before this time, the Karoo and its inhabitants saw the mass migration of springbuck, what was known as the trekbokke, as they crossed through Southern Africa and through the interior of the subcontinent. The Karoo was the area most associated with their incursions and it was here where the colonial encounter and "their intimate relation with the regime of private property" (Green, 2017:3) is believed to have added this animal phenomenon to the growing list of extinctions associated with the Anthropocene.

Colonial travel accounts detail vast herds of springbuck, estimating hundreds of thousands, sweeping across the Karoo. This irruption of nomadism by antelope is believed to have been in sync with the cyclical fluctuations of the Karoo ecosystem (Roche, 2008:159). The mass migration of antelope in the central parts of the Nama Karoo was a result of a build-up of large numbers of springbuck that followed the periodical and changing rainfall patterns from the eastern to the western regions of the Karoo. Their movement was allied to rainfall and the accompanying grass and shrubs that ensured favourable conditions for their survival in an arid ecosystem (Roche, 2008:159). However, these nomadic expressions of life were inevitably disruptive to the organised stock farming, which at the time of the cessation of the trekbokke, had become the dominant land making practice in the Karoo (Roche, 2008:160).

The extinction of the springbuck migration continues to haunt the Karoo. I first felt it in the home of one of my participants when I noticed two small pictures framed in dark wood. Both images depicted large numbers of springbuck bodies lying lifeless on the soil, their deaths curated for the picture. The newly killed springbuck were placed next to each other, as if to ensure that their deaths could be counted for many generations to come. Behind the springbuck stood their predators, some of them proudly holding their firearms. The occasion of death was not only on the day that picture was taken

– their wagons were subsequently embellished with the skulls of the antelope they had killed before, and some of the wagons carried mounds of springbuck skins. The consequences of their deaths would become apparent in the years to come. The caption of the picture reads:

> *The Last "Trekbok" Hunt*
> *Kareekloof, Strydenburg (1896)*
> *The Last Major Springbuck Migration.*

Figure 6: These two photographs are associated with the last great springbuck migration in the Karoo.

The reason for the extinction of the last major springbuck migration is not known with certainty[37]. The caption of the pictures reveals one part of the story rather literally: *"the last of the trekbok hunt"* coincided discernibly with the last major trek. To hunt is to kill and according to Roche, the extinction of the trekbokke was a result of a "new super predator in the form of colonial man and his firearm" who, instigated by the belief that the springbuck would compete with their domestic sheep for forage, killed 'competing' grazers (2008:183). What was obliterated then, now hangs in the hallways of farmers, seemingly like a trophy, but serving more potently as a reminder of the violence that ensued with their and my ancestor's movement into the Karoo. Povinelli (2017) has called for a reframing of the way in which we speak about death in the Anthropocene. She argues for the rhetoric of the "death" of the planet to be replaced by "killing" the planet to highlight the active participation of

[37] Some have argued that the impact of the rinderpest at the time of the cessation of the treks could have been the cause for their demise (Skinner, 1993). Roche (2008:169), however, has argued that the end of the springbuck migrations occurring during the same time as the spread of rinderpest into the Cape Colony was a coincidence. The rinderpest he argues, followed the trek, but only a few months after the springbuck had already migrated further South.

actors in causing death-worlds[38] (2017:55). The killing is spectacular and mundane. The "war waged", as Roche (2008:157) refers to it, against migrating springbuck is present in those spectacular pictures of death I saw, but alongside these expeditions was a far more subtle technology of death – fencing.

Writing on the *Anthropogenic Factors in the Cessation of Springbuck Treks and the Associated Disruption of the Karoo Ecosystem* Roche develops an argument for the impact of fencing[39] on the end of the trekbok migrations (2008:179). The enclosure of the Karoo, as Roche argues, significantly altered the conditions for their survival. The trekbokke ceased to exist, because the ecosystem and conditions that had supported and sustained their population ceased to exist (Roche, 2008). As mentioned above, it is no secret that humans have become widely regarded as the primary cause of mass extinction in this time (Kirksey and Helmreich, 2014: 549). Kolbert (2014) details what she calls the "unnatural" history of the sixth extinction, adding that "this time, the cataclysm is *us"*. Kolbert citing MacPhee, an expert on extinctions of the recent geological past, situates the problem of loss in the sixth extinction as occurring, for the most part, when "and only when, people began to expand across areas that had never before experienced their presence" (MacPhee, 1999:xi). Tsing et al. (2017:G3) remind us that the unequal relations between humans requires us to pay attention as to not essentialise "us" humans since "we" are not homogenous. In the Karoo this reminder is stark, since the extinction of Quagga's, the driving out of elephant, lions and other large animals from the Karoo, the cessation of the springbuck migration, the accompanying degradation of the Karoo veld, and other landscape disruptions all materialised with the arrival of colonial man and the (then) modern technologies that accompanied them. These technologies, as I have argued, bound the Karoo into new "relations of ownership and death" (Green, 2017), some of these spectacular, like the extinction of the trekbokke, and others as I will elaborate on below, more subtle.

In his poem *Mending Wall*, Robert Frost questions the often already assumed benefit of fences as a practice of good neighbourly relation. The narrator reflects on the apparent dislike of human built barriers by the more-than-human encounters that surround them and puts into question the paradigms

[38] Here I draw on Mbembe's (2003) theorisation of "death-worlds".

[39] Whether fencing was the cause of the cessation of the springbuck migration is under dispute. It has been argued that fencing only gained significant momentum after the last springbuck migration. However, Roche argues that the better watered areas were already fenced in at the time (2008:175). Owing to the nomadic movement of the trekbokke and the coinciding drought at the time of the cessation, these fenced in regions were most likely the same areas they would have migrated to (ibid.). Their decimation was more likely as a result thereof.

of those whose identity is dependent on the wall being there. Frost's question "Why do they [fences] make good neighbours?" is a line that has, recently, repeatedly served as a literary opposition to walls being built in democratic states across the globe as sentiments nationalism are on the rise. However, the question also provides a useful entry into matters of a more-than-human concern. If we imagine, as Haraway (2008) does, of the hosts of nonhumans that crawl, run, jump, expand, roll, flow and slide in the Karoo as our companion species, we might open up Frost's question of neighbourly relation and the infrastructures that designate them to the "host of organisms whose lives and deaths are linked to human social worlds" (Kirksey and Helmreich, 2010:545). If we extend the question of fencing to the multispecies relationships that occupy the Karoo landscape, then we might begin to see, as Tsing has, that "human nature is (always already) an interspecies relationship" (2012:144) and that "becoming is always becoming with" (Haraway, 2008:244). In the Karoo, the notion of "becoming with" is a useful way of understanding the work of ideological and technological change that enclosed the landscape and therefore also the interspecies relationships that make life in the Karoo. Jensen and Morita (2015) have written on the work of infrastructures as having the capacity for "making new forms of sociality, remaking landscapes, […] and reconfiguring subjects and objects all at once" (2015:83). In their work on "experimental ontologies of infrastructures" they open infrastructures up as sites where multiple agents, both humans, but especially nonhumans, gather, engage and together transform and produce "new worlds" (Jensen and Morita, 2015:85). Their work begins to unravel the practical ontology of infrastructure in the Karoo as it has configured, for the most part, violent human/nonhuman relationships.

Archer (2000) tracing an environmental historical perspective on *Technology and Ecology in the Karoo,* discusses the impact of the land use changes that accompanied infrastructural development in the Karoo from the early 20th century. The introduction of windmill technologies and the accompanying fences, writes Archer, have damaged and deteriorated the ecological wellbeing of the Karoo (Archer, 2000:679). Much of this, as I have suggested, has been instigated by the land care practices that allowed inflated sheep stocks, but farmers in the Karoo who were now farming on deteriorated and damaged land, explained that the ecological wellbeing of the Karoo was a far more complex interplay between the multispecies relationships that had gathered in the landscape – the same ones that were decimated by the cessation of the springbuck migration. The loss of the springbuck migration, is therefore not only felt in the lack of their vast and spectacular movement over the Karoo veld, but it is felt in the multispecies relationships that have unfolded in their wake.

These include the relationships between soil, plants, grasses, bush, rain, hoofs, eating, dung, and the hosts of organisms that thrive in their movement's life enhancing capacity. Increasing evidence, as Svenning (2017) argues, is pointing to the "direct" but also "indirect consequences" of the extinction of large animals on the "population dynamics of other species", including vegetation dynamics, as the "effects of the upper levels of food webs penetrating downward and likely even affecting biogeochemical cycling and climate" (2017:G74). Similarly, Yong (2018), writing on the decimation of migrating hoofed animals at the hands of humans argues that "lost animals aren't just lost bodies. Their knowledge also died with them". This is because the animal knowledge of migration is a learned behaviour. When they are killed in large numbers, their ancestral and intergenerational knowledge dies with them (Yong, 2018). However, "as [these] life-enhancing entanglements disappear from our landscapes ghosts take their place" and in the Karoo, as I will elaborate on below, these ghosts are multiple (Tsing et al., 2017:G4).

To imagine and notice the extinction of the great springbuck migration is difficult, since springbuck continue to roam in fenced off game farms, livestock farms, and conservation parks around the Karoo. This has led me to ask, how do we speak about the extinction of animal phenomena when the animals that used to produce such phenomena continue to survive, but no longer act within their multispecies life arrangements? Moreover, how might we understand death in such life arrangements? Van Dooren's contemplation of death, not as an ending within itself, but rather as "completely central to the ongoing life of multispecies communities, in which we are ultimately food for one another" opens up the dialogue for thinking about death (van Dooren, 2011:48). However, van Dooren is imagining the death of one species as the food and therefore also the life of another. Lyons further discusses how "life and death are no longer (or never could be) experienced as opposition categories" (Lyons, 2016:65). Instead if we come to understand the ways in which "death decomposes into life" and the ways in which "sinking" into new life "potentiates different realities for and relations to death" we can undo the imagination of life/death as oppositions (Lyons, 2016:65). In the context of the springbuck migration I would like to think about the death of a phenomenon of animal migration and the knowledge of such migration, and not the death of the animal itself, as an important feature when thinking about multispecies liveliness in the Karoo. The cessation of the springbuck migration has had a host of indirect consequences for the ecological wellbeing in the Karoo. Farmers who I walked the landscape with knew this, and for them the death of the springbuck migration was also the death of the multispecies entanglements that they encouraged. As the following passage will show, the

ending of trekbokke, continues to haunt the Karoo, and farmers saw the ghosts of diminished seed stocks, skewed vegetation composition, bare soil, and bare roots where the soil has washed away. Following them, today, the cessation of the trekbokke has demanded the human masters to bear witness and learn from these multispecies ontologies.

Figure 7: This is an example of a fence line. This fence line is very obvious, many of the ones I saw were more subtle. This picture shows a variety of grasses situated on the road verge (which has never been grazed). On the other side of the fence is a livestock farm, where there is hardly any grass observable.

"The way nature had it": old infrastructures, new relations of life.

The effects of fences on the Karoo veld and practices that surround them are most clearly seen along the fence lines where subtle, and at times obvious, shifts in vegetation are notable. This is the place where farmers point out the difference between the veld on our side of the fence, and the veld on the other side of the fence. This was the way that almost all the farmers I met introduced me to the difference in land care practices between them and their neighbours. It is also the way in which these practices are revealed through the variety of lively (or not) encounters between soil, water, bush,

insects, grass, seed and animals. Peter was the first of the farmers to drive me to his boundary fence and while we were looking down the fence this is his description of what we saw:

> Peter: "Do you see this boundary fence? [Yes] It is so stark it just isn't true. […] Look how sick the veld is on that side of the fence, it hasn't got volume, bulk, it has nothing, there is very few seed heads, the only seed head you'll find there is in a bush because it's being protected and yet, he carries a hell of a lot less stock than I do."

These kinds of changes in the vegetation assemblages are present and visible throughout the Karoo if only you wish to pay attention. In the above quote Peter is pointing out the difference between his farm and his neighbours farm and as I will elaborate on below, he is attributing this difference to practices. What Peter was pointing out to me on the boundary fence of his neighbour's farm was not so much what was there, but rather what was not there. These ghosts, as I refer to them, of diminished seed heads, plant bulk and of grass, were the "vestiges and signs of past ways of life is still charged in the present" (Tsing et, al., 2017:G1). For Peter, this was the way to show me, not only what was now missing in the Karoo landscape, but also what he had "reclaimed" since he arrived on his fourth-generation family farm, about 20 minutes' drive outside of Graaff Reinet.

Peter returned to the farm in the 1970's, but not long after, he realised that he could not carry on farming the way his mother, father and grandparents had farmed. They had been part of the generations that reaped the benefits of infrastructural development and inflated sheep stocks; the same generations whose economic benefits were detrimental to the ecological wellbeing of the Karoo veld. Peter knew this because the veld had "degenerated to a state" where "there was no grass" and they "had to buy feed just to try save lambs". As discussed in the previous chapter, the decision to change his land care practices was as much economical as it was ecological. The degradation of the veld, the same veld that sheep eat, demanded Peter to notice and respond to the decimation by our ancestors. Since the late 1970's and early 1980's, Peter responded to the ecological demands of the veld by transforming his farm from six large camps to ninety-one smaller camps. A strange starting point, considering the effects of fencing discussed above. However, as Peter explained, the problem of overgrazing was not a question of "too many animals". Rather, it was "the duration of time that the plants were being exposed to animals – that's the secret". Fencing was the infrastructure that allowed Peter to "manage time" and return to what he believed was "the way nature had it".

First, I will think with Peter and others I encountered about "the way nature had it". Peter described it as follows:

> Peter: "You had vast herds of antelope and buck roaming the field predators would force them to bunch, they would churn up the veld and move on. Now again it was *time*, they never stayed in any one place for very long because the predators saw to that, that was the catalyst, they churned it up, and they would stand and graze it, and merrily move on if the predators weren't there, but 90% of the time the predators saw to that. That was the way we then, Allan Savory[40], worked it out."

Most of the farmers I spoke to in the Karoo, like Peter, moulded their practices of regenerating the Karoo veld around the philosophy of recreating the animal phenomenon of migration. Phillip called it "mimicking natural migration"[41]. To mimic the migration of the springbuck, infrastructures mattered. The nexus of the infrastructural objects was the "cell centre", and it was the first place Peter drove me to when I asked him about the work of generating a liveable Karoo. It is difficult to see it at first, because in the cell centre the soil is bare. "Cell centre" is the term used to describe the centrally enclosed area where the sheep come to drink water, usually in the late afternoon. Shaped in the form of a wagon wheel, the cell centre connects all the camps that radiate outward into the veld. These camps are all lined by five strand fences, or "simple" fences, as Peter describes them. There can be anything between six to twenty or more camps that find their gateways into the cell centre. In total, Peter has fenced his farm into nine of these cell centres, significantly increasing the amount of camps he had on his farm. It is in these radiating camps where the practices of generating lively soils and grasses are seen. When we walked through one of the camps, bare soil patches were sparse, the grasses were high – well above the knee – seed fell into my shoes, the bushes were few, and the fence lines were difficult to notice. And so, the objects – the infrastructures, the fences – disappear and come into being, depending on the practices that are assembled around them. This leads me to my second matter of concern which is about the *practices* of mimicking natural migration.

[40] Allan Savory is a rangeland manager and ecologist. He pioneered the philosophy of managing livestock in such a way as to mimic migrating antelope. He proposes that a high stock density on rangelands for a short amount of time creates the condition for regeneration of plant and soils. This process must be monitored and should not be systemised. His method is referred to as "holistic resource management" or the "Savory grazing method" (Savory, 1983). Some farmers in this research draw heavily on his methods and principles of grazing. For further reading refer to (Savory, 2005).
[41] Interview with Phillip in April 2018.

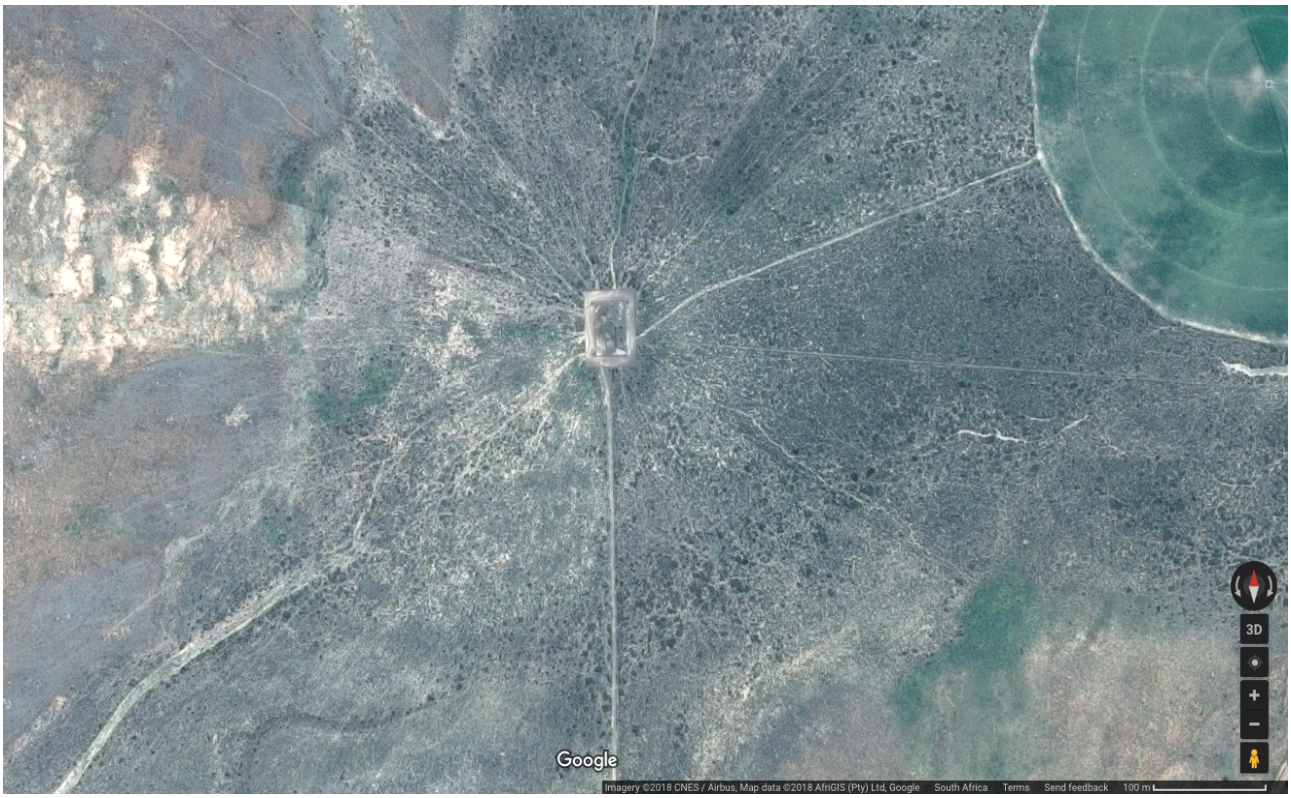

Figure 8: A google earth image showing the cell centre in the middle and the camps radiating outwards which make up the veld. The small lines coming towards the cell centre are sheep paths (see prologue).

Figure 9: An image from the top of a mountain depicting the “wagon wheel” fencing system. The radiating camps are connected by a central enclosure. This shows the infrastructure effects of mimicking migration. In this example, they are using the rotating grazing method to move buffalo. This example is larger and more obvious than those used on livestock farms where five strand fences are sufficient.

Mol writing on ontologies, argues that they are "brought into being, sustained, or allowed to wither away in common, day-to-day, socio-material practices" (2002:6). Following Mol, the question of what do fences do depends entirely on the practices in which they are manipulated (2002:5). On Peter's farm, the everyday practices that surround fencing, imitated the philosophy of springbuck forced to bunch up and migrate whilst in the presence of predators, churning up the soil, and then moving off only to return once the veld has rehabilitated. He elaborated:

> Peter: "That's what we have been trying to emulate here. It's exactly that! The game are now being replaced by domestic animals, and the predators, obviously for the bunching - we use fences."

Paradoxically the same infrastructures (the work of fencing) that destroyed the paths and movements of the migrating springbuck, were now being reimagined with the intention of mimicking the dynamic life enhancing relationships between animals, plants, movements, and soils that the trekbokke instigated. It is the practice of continuously moving sheep; allowing them to stay for a few days in one camp, and then moving them on to the next camp before they could do any damage to plants – but still prune, urinate, and defecate, whilst their hoofs loosen the soil and their bodies break plant matter providing mulch for future plant growth – that allowed farmers now to control an animal-plant relationship that would have occurred spontaneously before the onset of fenced off private farms. Michael claims that fencing does this work, if you want to manage degraded veld and bare soil:

> Michael: "the best way […] is to fence around that bare patch, put a thousand cattle in there for one day a year and you will change that bare patch overnight."

However, the relationship between the animals, plants and soil, was dependent on a careful, and yet intuitive knowledge that farmers had gained over the years of observing the cyclical fluctuations of the Karoo and the animal plant relationships that make life there. On Peter's farm, sheep stayed in any one camp only 3 to 5 days, depending on the size of the camp, the veld condition and the amount of rain, only to return every three to four months. That meant for 95% of the year any patch of vegetation would not be exposed to grazers. In the Karoo today, *resting* the veld has become essential in attempts to recover the soil and vegetation. The ongoing liveliness of the Karoo is therefore as much about the practices of rotating sheep stocks, as it is about "knowing ourselves as participants in

a more-than-human sociality" (Tsing, 2015:39). Fences have become a tool of a kind of biomimicry, and so too have sheep, depending on the practices that surround them, and "since the object of manipulation tends to differ from one practice to another, reality multiplies" (Mol, 2002:5). Hereby fencing comes to hold the promise of transformation of vegetation in the Karoo (Harvey and Knox, 2012). In the Karoo, I saw the multiple realities along the boundary fences showed to me by farmers. The difference, as I will elaborate on in the next chapter, was a close observation and engagement with understanding multispecies entanglements and enactments. This time however, these entanglements were engaged in a landscape making practice where icons of domestication are enrolled in regimes that imitate wilderness and what farmers imagined to be "the way nature had it".

In conclusion, I have argued that the work of infrastructural development, namely windmills and fences, and the promise of economic prosperity that they encourage has reconfigured and pulled the Karoo landscape into pockets of private property that in turn have compromised the multispecies relations that, before this time, generated life in the Karoo. The killing (both intentional and unintentional) and the subsequent death of all the symbiotic relations that are born through the phenomena of migrating springbuck, has required farmers, if they wish to continue worlding in the Karoo, to pay attention to the multiple worlding projects that make life in the Karoo. It is the knowledge and movement of migrating springbuck, with their life enhancing capacity, that has inspired and generated the knowledge for farmers attempting to rehabilitate the Karoo landscape. Moreover, it is the translation of the migrating springbuck into everyday farming practices that make use of infrastructures in new ways that farmers believe instigate the conditions of a Karoo veld liveliness. Thus, depending on the practices assembled around infrastructures and the relations that they encourage, we can begin to see "infrastructures as emergent systems that produce novel configurations of the world – new practical ontologies" (Jensen and Morita, 2017:618). The Karoo infrastructures first promised relations of life. However, these relations of life caused new and different relations of death, which have in turn instigated the demands for new multispecies human/nonhuman life and death arrangements. Since this time the Karoo landscape, and its material configurations, are again seeing changes – this time farmers are using infrastructures in ways that pay attention to, and open up questions of earthy togetherness in our time.

CHAPTER 4

Enacting a Karoo 'Nature': Domestic Sheep and the Performance of Lively Ecologies

The first two chapters have laid the foundation for thinking about the ways in which the farmers in the Karoo, with their life making practices, have had to reimagine the Karoo veld as entangled in multiple life making projects. This takes place in a context where the concerns of environmental damage have demanded farmers to witness themselves as participants in a more-than-human world. Moving on from the previous chapter that looks at fencing as a way of regenerating the Karoo land, this chapter is about the unfolding of multispecies entanglements in the everyday practices that occur inside the fences of a Karoo livestock farm. I consider what counts as 'nature' in situations where domesticated livestock are enrolled in practices that are believed to enact and mimic icons of wilderness in a quest to bring back the natural vegetation of the Karoo. Following Mol (2002), I explore how we might think of the "sheep multiple" as both monsters and rehabilitators of the land. I trace how the work of sheep and their bodies, as both destroyers of the land and rehabilitators, are contingent on the material practices in which they are performed. As such, I will look at the ways in which the practices that are engaged in generating a Karoo liveliness are always already relational. I pay attention to the entanglements that make clear the sensitive relations occurring between humans and nonhumans on the Karoo farms I visited. Some of these entanglements are inspired by the work of farmers and their careful participation in the more-than-human world, and some of these occur outside of human attempts to control. Therefore, this chapter is about understanding the ways in which 'nature' and 'culture' are not separate entities, but how they are enacted and shape each other in a variety of ways in a particular ordering of Karoo 'nature'.

Monstrous entanglements and the causes of a new sheep practice

When we imagine the Karoo veld as having been overgrazed, we are lead to the mouths of sheep that graze that land. Sheep have become monsters, much like the jellyfish, as Tsing et al. (2017:M1) have argued. Much like "the richness of earlier marine assemblages is overwhelmed" (ibid.) by the gross numbers of jellyfish who consume the small fish fry, so too the earlier vegetative assemblages of the Karoo have been overwhelmed at the mouths of the sheep who have continuously grazed on the most palatable Karoo plants. Monsters have become figures of the Anthropocene (ibid.). They are useful because "on the one hand, they help us pay attention to ancient chimeric entanglements; on the other, they point us toward the monstrosities of modern man" (Tsing et al., 2017:M2). It is no secret that

the Karoo, a landscape fraught with unpredictability, has been pulled into something completely different at the work of sheep and their human masters. However, much like the "ostensible universality" of "man" in the (anthro)pocene, I am reminded by Alaimo (2017) to refrain from positing environmental degradation of the Karoo as the work of sheep who have become destroyers of the Karoo environment. Instead, I am lead back to the heterogeneous assemblages that ask how sheep are enacted in practice.

Sheep have inhabited Southern Africa for over 2000 years (Muigai and Hanotte, 2013:44) with the Khoekhoen having owned fat-tailed sheep with hair coats. However, it is the introduction of Merino sheep, that accompanied their colonial masters into the interior of South Africa in the early 1800's, that has significantly altered the Karoo environment (Shaw, 1975:202). In 1975, Shaw warned about the introduction of Merino sheep, arguing that "the persistent and greedy system of overstocking farms has changed the flora, introduced and given undue influence to a worse herbage, and bids fair in time to change the climate and, with this, the whole character of the vegetation" (1875:202). Contrary to the fat-tailed sheep present in Southern Africa at the time, who had no "fine wool qualities" (Erasmus, 2014), Merino sheep, who find their origin in Spain and who are known for growing the best wool with the finest and strongest fibre, were imported to further the colonial agenda expanding their frontier into the hostile Karoo territory. Overstocking farms in the Karoo, as I have argued elsewhere, was therefore inextricably tied to the economically viable Merino sheep (Katzen in Natrass et al., 2017). Moreover, being that the Karoo is an arid environment, the replacement of the nomadic worlding projects between humans, plants and animals by tightly controlled capitalist livestock farming was detrimental. The newly introduced Merino sheep and their economic potential entangled them in a set of relations that rearticulated them from icons of domestication to icons of damage.

Domestication has been defined in anthropology as "a cultural and biological process [...] that can only take place when tamed animals are incorporated into the social structure of the human group and become objects of ownership". Furthermore, it is when animals are defined as "bred in captivity, for purposes of economic profit to a human community that maintains *complete* mastery over its breeding, organization of territory and food supply" (Clutton-Brock in Cassidy and Mullin, 2007:5). In the Karoo, fencing is the most visible marker of attempts at ordering, managing, and confining the Karoo veld into the logic of an extractive economic sheep making. But as Lien writes, "it is as if a

fence itself bears promise of control. But appearances betray. The fact is that confinement in itself tells us very little about what is going on inside the fence." (2017:M108). It tells us little, because "animals and plants are as dynamic and flexible as we are, and as long as we are alive, they continue to surprise us" (ibid.). The response of the 'natural' vegetation in the Karoo surprised the modern men who thought the Karoo veld was more productive than it actually was. In the Karoo, the veld refused to conform to the introduction of a systemised sheep farming that counted upon life to "exceed" in the regimes of domestication (Beldo, 2017:108). As the history of sheep farming in the Karoo has shown, this expectation was premature, since the unruly vegetative assemblages could neither conform to nor continue these practices of livestock farming, since the production of sheep flesh and wool in the Karoo relies entirely on the veld on which they graze. The introduction of practices of fencing that allowed the sheep to graze "freely" and forage constantly on the most desirable plant species saw the Karoo veld deteriorate, leaving behind bare and washed away typologies of erosion. In line with this, the most pressing issue for the farmers I visited was therefore the question of food supply, since they and their livestock depend entirely on the natural vegetation of the Karoo – a condition that they could not simply control by sowing pastures (see chapter two). These are the uneven effects of "massive human transformations of multispecies life" (Tsing et al., 2017:M2). These are also the "surprises" that Lien (2017) describes, because, as Lien has argued, the stories of domestication we are told and tell, are often singular, forgetting to pay attention to relationality.

At first, the colonial human-sheep relations paid little attention to the multispecies livingness (the veld) that provided sheep with food. However, as I have argued above, a veld liveliness is a condition upon which both humans and sheep rely. Domestication then can be understood as a "two-way process compromising different paths and distributed forms of agency, and that emphasise its unintended consequences rather than human mastery" (Lien and Law, 2011:74-75). Echoing this we can begin to see that domestication is neither an "event" or an "invention" but a "co-evolutionary process" (Muigai and Hanotte, 2013:41). Whilst fencing was a way for farmers to manage their sheep, since its erection, fencing was also the thing that required farmers to manage in ways they had not yet anticipated. Meanwhile, in the Graaff Rienet region, farmers were now far more concerned with the response of the vegetation inside the fence. The close attunement to plant/animal relations saw farmers enrolling domestic animals in new practices that are seen to be a cause for rehabilitation. A Karoo farmer, Anton, emphasized these relations by arguing that domestic livestock cannot be a cause

of degradation: “nowhere do I know is there animals that have damaged plants, because they need each other […] management damages plants”. Anton here brings an important issue to the fore that situates a Karoo liveliness within questions of “how are objects handled in practice” (Mol, 2002:5), and in the Karoo, I ask how are sheep handled in practice.

Whilst sheep have been destroyers of the veld before, on the farms I visited, their bodies were now being used to perform practices of rehabilitating the veld. Moreover, sheep have become the embodiment of a new kind of imagination of rehabilitation, one that mimics the earlier springbuck migrations (see chapter three). Fencing has become a way for farmers to implement these practices of mimicry. Today, veld restoration is grounds for invigorating alternative practices of domestication. What might this tell us about the ways in which domestication is enrolled in practices of reinvigorating an imagination of a Karoo ‘nature’/wildlife?


Figure 10: Merino sheep gathered in fences.

Animating a Karoo wildlife: mouths, hoofs, bodies

I will return to one of the many days spent watching the movement of sheep in the veld, and in doing so I will discuss what their movement means for the multispecies worlding project thought to bring about the 'natural' Karoo veld.

The movement of sheep has become entangled in projects of a Karoo veld in the making. Whilst standing in one of the camps on Peter's farm, the sheep are moved by three staff members from the top of the hill towards the bottom where I wait with Peter for the sheep to arrive. This flock, comprising of about 150 sheep, are being moved from one camp to another, and they follow each other with ease, but with the guidance of their human directors. Their movement has been planned many months before in a neatly controlled, yet flexible schedule that ensures they remain in any given camp for the 'right' amount of time. Sheep were moved, depending on the size of the camp, the typology, quality of the veld, and the available amount of forage after only a few days of grazing. The consistent movement of sheep is to ensure that they eat enough of the plants, but not too much to cause damage, making sure not to expose the plants' root systems to overgrazing. Farmers used the metaphor of an iceberg to explain this animal/plant relationship to me. Two thirds of the plants vitality remains unseen (at least in good conditions), underground in its root system. The part above the ground is the third of the plant that is exposed to grazing animals. "You want a healthy root system", Peter explained, and to ensure a healthy root system, you need the plant to recuperate for long enough after grazing. This was a carefully thought out method, that was built from years of experience on the part of farmers. Plants had to be grazed down, almost to the ground, but the regrowth, which can occur even when it has not rained, and hereby draws from the vitality of the root system, must never be grazed. It must not be grazed because then you are compromising your root reserve, the same reserves that carry plants through times of drought – a common occurrence in the Karoo. The movement of sheep, as a means of rehabilitating the veld was animated according to the previously spontaneous movement of wildlife.

Ensuring that sheep do not overgraze or rather re-graze plants after too short a period of time is vital for veld recovery, but not grazing plants at all can cause another problem. Sue, who has been conducting long-term research on a patch of land in the succulent Karoo for 30 years explained this to me. During the recent drought, the site which had excluded livestock for over 30 years, suffered a lot more drought mortality amongst the shrubs. This is because if the shrubs are left to continuously

grow with no exposure to grazing, when the drought hits and they begin to compete for resources, more of them die. The root system cannot survive the drought, because the plants are too big and woody to sustain. "So, plants need a certain amount of pruning" and "grazing is compatible with conservation, so long as it's not brutal grazing" (Sue). This understanding of animal/plant relations in the Karoo is adapted in farming practices too. Farmers would move their livestock in and out of a camp, depending on a close observation on the effects of the animals on the plants. They needed to graze vegetation to convert plants into animal proteins. But when the animals were outside of any given area, that area needed to be left to "rest". Resting the Karoo land has become a central part of attempts to recover vegetative damage. It is essential for the continuance of life for the plants and seeds of the Karoo. They needed to recuperate from the energy converted to the flesh of livestock. The movement of sheep that implemented a careful balance of plant exposure to animals and then followed by extensive rest, as Anton explained, was all about "the practices of time control".

The practice of moving and rotating livestock had another important function in the recreation of animal/plant relations that farmers believed fostered healthy environments. Sheep were not only important as pruners of the veld, but their bodies, bunched up, usually a result of smaller camps and larger herds, caused what farmers described an "animal impact". The animal impact happens when you "maximise your animal density for a minimum time" (Anton) in an area of veld. In doing this, farmers create the conditions whereby sheep are used to *disturb* the soil and plants. Tsing disrupts the common belief that disturbance is always connected to damage (2013:160). Rather, she argues, "disturbance, used by ecologists, is not always bad – and not always human" (ibid.). For the farmers, disturbing the soil is thought to be a life enhancing enactment. Firstly, because when animals are bunched up their hoofs churn the soil and this practice of breaking the hard baked and plant-less crusts of soil creates favourable conditions for seed germination. Moreover, their hooves can round the sharpened walls of rivers of erosion, performing an important practice of "healing" erosion. Secondly, when livestock is moving through the veld in this way, their bodies will break the woody and dry plant species (the kind that are not very favourable for food, nor plant diversity) returning old dried branches, otherwise referred to as "litter", to the soil, and to the carbon cycle[42]. Finally, if livestock are concentrated in camps, these areas are also concentrated by their dung and urine, which are both litter and humus making it favourable for future plant growth. If you know the

[42] Angus pointed this out to me. Thinking about the carbon cycle was very important for some of the farmers in this research.

forms of these relationships you will see the accumulation of organic debris forming lines across the Karoo floor. These are the “litter banks”.

Figure 11: Peter is showing me how the dead debris of plants and animals congregate into what he refers to as litter banks, and how these slow down the flow of water allowing for more absorption into the soil.

Litter banks were pointed out to me by Peter. They are small broken bits of dried twigs, bush, leaves and dried dung, trapped and washed up in longer and shorter lines; depending on how they stick after the rain. There are hundreds of them all over the veld and they do the work of slowing down water flows and softening the soil[43]. Where these banks have formed you find a congregation of seed and moisture that together cultivate the possibility for seedlings to establish themselves, in hopes for more plants and food in the future. This hope is born from everyday events of animal plant symbiosis that together produce the dead organic debris that become grounds for an emergence of new life. “That’s the significance of litter banks, it’s all part of nature” Peter explained: no man-made machinery can

[43] Farmers associated the “slowing down” of water as a result of their work in veld regeneration. Slowing down the flow of water was vital for all the farmers I visited. This is because when the water is slowed down, there is a higher water retention into the soil. Stories of empty dams, but good veld, were often explained to be a result of this.

do the restitutive work necessary in the veld "healing process" than these small congregations of dead organic debris and "that's why they play such an important role, it's nature's way to help you heal the veld" (Peter). These relationships are vital in the process of generating a Karoo veld liveliness, and it is these stories that open us up to noticing the other than human worlding projects, both animate and inanimate.

Enacting multispecies entanglements

Restoration in the Karoo requires a nonhuman vitality, what Beldo (2017:118) calls, "metabolic labour" that is performed by the livestock that walked and worked the farms that I visited. In doing so, they were now a central tool, used for re-cultivating the very landscape that they relied on. Here, sheep enact a metabolic labour "exceeding human inputs", both at a cellular level, but also in their role in restoring the vegetation and all its living ensembles (Beldo, 2017:118). Therefore, whilst a particular imagination of Karoo 'nature' occurs within the human/animal relationships, they also occur within the margins of human intervention. Hereby we can see that in the Karoo, the practices of curating an "animal impact" and the disruption that it encourages, is seen as instigating life enhancing relationships, of which some are linked to humans, and other occur outside of human curations. These mutually occurring practices entangle us humans into the life and death worlds of the Karoo. And in turn, nonhuman worlds continue to be drawn into the "all too human" worlds – what Kohn refers to as the "moral worlds that we humans create, which permeate our lives and so deeply effect those others" (2013:5). For farmers in the Karoo, generating a veld liveliness is dependent on a host of relationships that enacted preferred narratives of a Karoo 'nature'. These relations were dependent on the living and the non-living who together produce a Karoo liveliness. Take for example the bodies of sheep – their bodies do not only matter whilst they are living, but once dead, some farmers would move them onto the bare patches of soil. It is about the way in which birds who feed on their carcasses disrupt the soil with their scavenging feet, and the way in which the decomposing dead bodies of the sheep reinvigorate potential for new life. Martin emphasised how the veld is entirely dependent on the multispecies relationality that generate ongoing life.

For Martin, it was important to point these out to me. Whilst driving in the veld, he stopped to pick up a variety of seeds. These seeds were intimately connected to the conditions of life in the Karoo landscape. One of the ways in which the small plant would disperse its seed was through contact with water. The dried plant that Martin picked to show me, held its seeds tight in its dry flowery head. The

flowery head would only release the seed once it was wet, dropping the seed along with the rain to the soil. These kinds of stories are multiple in the Karoo, and they describe the world making projects that occur outside of human control, and yet humans rely on these stories of worlding. In the Karoo today, I imagine wilderness as the kind of ecological subtleties that occur outside of human control. The veld could not be sowed, which limits human intervention in determining its liveliness. These subtleties were often described in the times of "rest"; the moments when livestock are removed from their camps and the vegetation is able to recuperate, generating a vitality that farmers could not produce themselves.

Figure 12: These are two examples of seed that Martin showed me. The picture to the left is of seed that is born from the flowery head, described in the body of this text. The picture to the right shows another seed. This seed is sharp with two little 'wings' that help stabilise, hook and drill the little seed head into the hard-baked Karoo soil.

Therefore 'nature' is made through the imagination of a particular wilderness enacted by the bodies of sheep and the plans of humans constantly observing the relationships that occur and make life outside of their control. And yet farmers can only enact a particular imagination of what 'nature' is by using the bodies and the "metabolic labour" of domestic livestock that can be moved – performing

a timely-reality that mimics and is thought to enact and bring about what would have been an untainted 'wilderness'. As such, the control of this timely-reality promised by domestication is performed and practiced by sheep in order to enact a particular order of Karoo ''nature''. Sheep, who are emblems of domestication, are therefore used as a tool that is believed to reinvigorate a kind of Karoo wilderness. However, the wilderness does not stand in opposition to the regimes of domestication, because the new way of "doing" domestication draws on the ideas of a kind of wildlife believed to "bring back" the natural vegetation of the Karoo. The farmer, Phillip, articulated this to me when he expressed discomfort at using the word "domestic" in referring to his plans of using livestock to rehabilitate veld that had been turned into a game reserve, and that was subsequently severely damaged. I asked Phillip why he did not want to use the word domestic in referring to the rehabilitation work of the sheep. He felt that when you use the word domestic, it immediately imagines it in opposition to "wildlife", but as he explained you are using "domestic stock to do wildlife work […] it is part of wildlife, the natural pattern" (Phillip). In the Karoo landscape these categorical oppositions have been mixed up for a very long time. Therefore, the new ordering of 'nature' on the Karoo livestock farms in this research, does not separate the human and the nonhuman, the cultural and the natural, or the domestic and the wild. Rather, as Phillip reminded me, farmers (much like scholars) needed to grasp that "nature is a complex system" and that "you can't plan complexity, you've got to actually work with complexity". This "complexity" tells a story of nature, but one where sheep are deeply entangled in its making, because their movement can be controlled, allowing farmers to mimic imaginations of wilderness that creates a veld liveliness. Therefore, to reimagine ourselves as participants within a more-than-human world, whilst simultaneously understanding ourselves as "keystone species within the system" we begin to open up the messy entanglements that refrain from rearticulating 'nature' and 'culture' as separable entities (Desperut and Meuret, 2016:26).

There is a new and unsuspecting monster in town

Sheep on the farms I visited no longer bore the markers of monsters, but new and unsuspecting monstrous encounters are occurring in the Karoo. These new relations of monstrosities, as told by farmers, were springbuck and other wildlife. According to the farmers, there has been a surge in the amount of wildlife farms, which are replacing livestock farms. However, these wildlife farms are making use of the same practices that had caused overgrazing when the settlers arrived; replacing the then abundant wildlife with domestic livestock. Martin's story of a fence line between the sheep farm

and the game/wildlife farm explained the problem. On one of the organised trips to evaluate veld condition, Martin could clearly see the difference between the sheep farm and the wildlife farm along the fence line. Contrary to the public's expectation of what 'wildlife' and 'nature' should be in the Karoo, as Martin explained, on the wildlife farm the grass component had completely been destroyed. "You could actually say the sheep farm is donating seed to the wildlife farm" Martin remarked, since the one meter strip that borders the sheep farm fence line is the only evidence of vegetative species diversity. The reason for this was simple. On the side of the wildlife farm, "the vegetation is consistently exposed to grazing animals, the grass can never rest, and never produce more seed because the antelope constantly grazes it" (Martin). The temptation to imagine indigenous animals as 'wild' and therefore in symbiosis with the vegetation of the Karoo, as Sue explained, was misleading. This example was a stark reminder that the making of monsters knows no species, but rather that the uneven effects of the Anthropocene creates life for some at the expense of others (Tsing et al., 2017:M1). Instead, antelope, like sheep, still eat plants and they have an "effect on the plants" regardless of their status as indigenous (Sue). Concurring Martin, Sue also used the picture of the fence line to explain to me that she had seen "many fence lines in contrast, where there is gemsbok on one side and sheep on the other and the gemsbok side [the vegetation] is much worse".

Angus, who also grew up on the farm that he is now managing, felt bothered by two simultaneously occurring shifts in perceptions of Karoo veld and the animals that inhabit it. The first was that he felt saddened that an increasing majority of farms around his farm were being converted from sheep farms into game farms[44]. This shift would have shocked my own grandfather, Angus exclaimed (who was a student on the farm that he now owns), because this region is prime sheep farming county. However, Angus was saddened that many of the sheep farmers believed that springbuck were now a cause of environmental damage. He explained it to me as follows:

> Angus: "[Springbuck] are the essence of the Karoo. People say, "ya but they damage the veld", I don't believe it for one second, how can a springbuck damage the Karoo, that's like saying a parasite kills its host, it's stupid, because what happens to the parasite it dies with its host. Springbuck, as are blesbuck, black wildebeest and kudu, designed for the Karoo, they evolved with the Karoo."

[44] Game farms are privately owned farms that run an assortment of 'game', including, springbuck, kudu, rooi hartebeest, wildebeest, gemsbok, and some more exclusive varieties, like black springbuck.

Angus's expressions of the symbiosis between springbuck and the Karoo, however, neglects the fact that springbuck are not singular entities. Rather, they are entangled in a myriad of relations that determine both how they react and act within the Karoo landscape. And now, as Martin explained, on his farm springbuck are continuously grazing on the most palatable and sensitive area's and therefore destroying the veld. This is because springbuck cannot be herded and moved, since they are wild, nor can they act outside of the human interventions that form part of the current Karoo landscape. Anton unfolded and concurred this problem to me as follows:

> Anton: "So, then the thinking was well if we take them [the sheep] off it will restore the land. So, they [the game farm owners] then took all the fences out, all the domestic animals off, put a big fence around the outside and put all the wild animals back in – and all that did was continue the same management. It went from some sort of management with domestic animals to the benign neglect of wild animals. So, you end up with exactly the same set of management principles taking place on the land. So, the only advantage domestic farming had is that it can control its animals. At least to the point of having some grazing practice, but with game farming now you effectively have low numbers of animals on the land permanently. There was no means to do any grazing plan/management and the fact that they had a fence around them, meant that they can't go anywhere either. So, the result was that the damage accelerated - so the most sensitive areas which generally are the most palatable got hammered first and then the next most sensitive, and then the next most sensitive."

In the above description Anton details how the wild antelope, in relation to humans who assemble the practices within which animals are enacted, produce a particular Karoo reality. According to Anton, the new monstrous relations are because of the management principles of the humans who confine them in fenced off camps and allow them to graze freely and continuously, whilst inflicting a slow degradation of the most palatable parts of the veld. We begin to see how "animals may fuse, refuse, and confuse nature-culture categories and ontologies" (Kirksey and Helmreich, 2010:553). Ironically the springbuck, considered to be 'wild' and thus 'natural' in the Karoo, cannot produce the very movements that farmers believe can bring back Karoo nature. This is because, as Anton suggests, they cannot be controlled and moved like domestic livestock. Instead, by reinvigorating an imagination of "the way nature had it" and the accompanying flourishing veld, farmers used domestic

animals to re-enact the movements of springbuck, the same movements that are believed to have fostered a Karoo veld liveliness.

In this chapter I have discussed how the animal, plant, soil and seed relations, along with the ones I have not yet been shown, are enacted by the bodies of foraging sheep, whereby a particular sheep reality "performs a particular ordering" of Karoo 'nature' (Lien and Law, 2011:70). Today sheep have proved themselves to be useful parts of rehabilitating the landscape, at least by the personal accounts of the farmers I visited. The practices described above have shown how the bodies of livestock are curated by the plans of farmers, who erect fences and move them with careful consideration. It is therefore evident that sheep do not "stand by themselves". Rather, they are the effects of the "relations of practice" that organise around them and that they organise whilst producing a particular Karoo reality (Lien and Law, 2011:70). Similarly, springbuck and their enrolment in regimes of domestication, has been grounds for new monstrous relations, further accelerating damage to the multispecies entanglements from which they have been removed. Thus, the work of sheep, humans, and other nonhumans, as this chapter has shown, demands us to see as farmers have – how today the Karoo landscape is a product of a particular "nature-culture" that can no longer separate 'humans' from 'nonhumans' or the realm of the 'domestic' from the 'wild'. Rather, we need to begin to unravel how, in this moment of the Anthropocene, "our continued survival demands that we learn something about how best to live and die within the entanglements we have" (Tsing et al., 2017:M4).

CONCLUSION

This thesis has responded to questions that consider what becoming in the Anthropocene might look like by exploring how farmers in the Karoo are generating the conditions for a Karoo liveliness on the ecologies of damage that they inherited. In order to see the present more clearly, this thesis has looked to the past where the desire of modernisation and progress and the accompanying land care practices and infrastructures have cheapened, damaged and degraded the Karoo landscape. The deteriorated veld, the same veld that the farmers rely on to provide fodder for their livestock, as chapter two argued, was cause for new human/nonhuman relationships. This has demanded farmers to be accountable to the more-than-human social worlds (of which they form part) if indeed they wish to imagine a future in the Karoo. Survival on Karoo rangelands, as I argue, has demanded farmers to pay close attention to what Green calls a "reparative oikologics", where ecology and economy jointly reimagines what becoming in the Anthropocene might look like (2014:7).

Following on from this, chapter three provides an overview of the intersection of politics, economics, technologies and infrastructures in shaping the ecological materialities of the Karoo. The enclosure of the Karoo veld into capitalist livestock farming, as I show, has caused the severe overgrazing of the Karoo veld. In this chapter, I mourn with Haraway about the "irreversible losses" (2016:101) that accompanied the colonial move inland, including the cessation of great springbuck migration and the previously nomadic multispecies worlding projects that made life there. I argue that the death of the migrating springbuck has also meant the death of their life enhancing capacities. As I show in this chapter, today infrastructures (with the focus on fencing) have become grounds for new ontological practices of regenerating the Karoo veld. However, this time farmers are translating the animal ontologies of migrating springbuck into the everyday socio-material farming practices that are believed to "bring back nature". By looking at the practices of farmers in their quest to bring back a particular ordering of Karoo 'nature', chapter three begins the discussion on relational ontologies that is further developed in chapter four of this thesis.

Chapter four argues, using the concept of the "sheep multiple" that the sheep's status as either destroyer of the veld or rehabilitator of the veld, depends entirely on the relationships within which they are enacted. In this chapter, I trace how the bodies of sheep are curated and moved in order to perform a particular ordering of Karoo 'nature', one that mimics the migrating springbuck. This movement is believed to instigate multispecies liveliness. Here sheep (emblems of domestication) are

enrolled in practices believed to enact and bring back a Karoo wilderness (the natural vegetation of the Karoo). This chapter brings together the aim of this thesis, which is to show how the conditions of a Karoo livability does not and cannot separate 'nature' and 'culture', 'wilderness' and 'domestication', 'economy' and 'ecology', 'human' and 'nonhuman' and 'living' and 'dying' into separable kinds. Rather, as I have learned along with the humans and nonhumans that make life in the Karoo, they jointly produce the kinds of futures that can be imagined for the Karoo.

BIBLIOGRAPHY

Acocks, J. 1953. Veld types of South Africa. *Memoirs of the Botanical Survey of South Africa.* 28, 1–92.

Alaimo, S. 2017. Your Shell on Acid: Material Immersion, Anthropocene Dissolves. In: Grusin, P. (ed.) *Anthropocene Feminism*. Minneapolis: University of Minnesota Press, 89-121.

Anthropology Southern Africa. 2005. Ethical guidelines and principles of conduct for anthropologists. *Anthropology Southern Africa*. 28(4), 142-143.

Archer, A. 2000. Technologies and Ecology in the Karoo: A Century of Windmills, Wire and Changing Farming Practice. *Journal of Southern African Studies*. 26(4), 675-695

Atkinson, D. 2016. Is South Africa's Great Karoo region becoming a tourism destination? *Journal of Arid Environments*. 127, 199-210.

Atkinson, R. and Flint, J. 2001. Accessing hidden and hard-to-reach populations: Snowball research strategies. *Social research update.* 33(1), 1-4.

Barad, K. 2003. Posthumanist Performativity: Towards an Understanding of How Matter Comes to Matter. *Journal of Women in Culture and Society*. 28(3), 801-831.

Barad, K. 2007. *Meeting the universe halfway: Quantum Physics and the Entanglement of Matter and Meaning.* Durham: Duke University Press.

Beldo, L. 2017. Metabolic Labor: Broiler Chickens and the Exploitation of Vitality. *Environmental Humanities.* 9(1), 108-128.

Blaser, M. 2013. Notes Towards a political ontology of 'environmental' conflicts. In: Green, L. (ed.) *Contested Ecologies.* South Africa: HSRC Press, 13-28.

Botha, J. F. 1998. Modelling subsurface flow in Karoo aquifers. *Transactions on Ecology and the Environment*. 17, 379-386.

Briske, D., Sayre, N., Huntsinger, L., Fernandez-Gimenez, M., Budd, B. and Derner, J. 2011. Origin, Persistence, and Resolution of the Rotational Grazing Debate: Integrating Human Dimensions Into Rangeland Research, *Rangeland Ecology & Management,* 64(4), 325-334.

Cassidy, R. and Mullin, M. (eds.) 2007. Where the Wild Things Are Now. Domestication Reconsidered. Oxford and New York: Berg.

Cape Wool SA. 2019. *Seasonal Overview if the South African Wool Clip for the 2018/2019 Wool Season.* Available from: www.capewools.co.za [Accessed 20 August 2019]

Chakrabarty, D. 2008. The Climate of History: Four Theses. *Critical Inquiry.* 35, 197-222.

Clifford, J. 1986. Partial Truths. In: Clifford, J. and Marcus, G.E. (eds.) *Writing Culture: The Poetics and Politics of Ethnography.* Berkeley: University of California Press, 1-16.

de Certeau, M. 1984. *The practice of everyday life*. Berkley: University of California Press.

Despret, V. and Meuret, M. 2016. Cosmoecological Sheep and the Arts of Living on a Damaged Planet. *Environmental Humanities*. 8(1), 24-36.

Dean, S. and Dean, R. n.d. *Wolwekraal, dynamic interface of people and conservation*. Available from: http://www.saeon.ac.za/enewsletter/archives/2018/april2018/doc02 [Accessed 20 December 2018]

Dean, W. R. J. and Macdonald, A. W. 1994. Historical changes in stocking rates of domestic livestock as a measure of semi-arid and arid rangeland degradation in the Cape Province, South Africa. *Journal of Arid Environment*. 26, 281-298.

Dean, W.R.J., Hoffman M.T., Meadows, M.E. and Milton, S.J. 1995. Desertification in the semi-arid Karoo, South Africa: Review and reassessment. *Journal of Arid Environments*. 30(3), 247-264.

Erasmus, D. 2014. *A history of SA Merino farming.* [Online] Available from: https://www.farmersweekly.co.za/animals/sheep-goats/a-history-of-sa-merino-farming/ [Accessed 20 December 2018]

Esler, K. J. Milton, S. J. and Dean, R. J. W. (eds.) 2010. *Karoo Veld. Ecology and Management.* Pretoria: Briza Publication.

Fioramonti, L. 2017. Gross domestic problem: how the politics of GDP shaped society and the world. In: Borowy, I. and Schmelzer, M. (eds.). *History of the Future of Economic Growth*. London and New York: Routledge. 91-109.

Foster, J., B. 1999. Marx's Theory of Metabolic Rift: Classical Foundations for Environmental Sociology. American Journal of Sociology. 105(2), 366-405.

Foster. J. B. 2000. *Marx's Ecology*. New York: Monthly Review Press.

Frost, R. 1914. Mending Wall. In: Frost, R. *North of Boston.* David Nutt.

Furstenburg, D. 2005. The Steenbok. In: Botma, J.P. and van Rooyen, N. (eds*.). Intensive wildlife production in Southern Africa*. Pretoria: Van Schaik Publishers.

Geertz, C. 1998. Deep hanging out. The New York review of books, 45 (16), 69.

Green, L. 2014. Fracking, Oikos and Omics in the Karoo: Reimagining South Africa's reparative energy politics. *The Thousand Names of Gaia. From the Anthropocene to the Age of the Earth*. 1-15.

Green, L. 2016. "Give Us Evidence!" What does it mean to ask for 'evidence-based research' in

decision-making on hydraulic fracturing? Forthcoming in: Glazewski, J. (ed.) *Shale gas extraction or fracking in the Karoo: Critical sustainability, law and governance perspectives*. 1-22.

Green, L. 2015. The Changing of the Gods of Reason: Cecil John Rhodes, Karoo Fracking, and the Decolonizing of the Anthropocene. E-flux journal 56th Venice Biennale. 1-9.

Green Economy Coalition. 2012. *Sign up to the 9 Principles of a Green Economy*. [Online] Available from: https://www.greeneconomycoalition.org/news-analysis/sign-9-principles-green-economy [Accessed 20 December 2018].

Grusin, R. 2017. Introduction. In: Grusin, R. (ed.) *Anthropocene Feminism.* Minneapolis: University of Minnesota Press, vii-xix.

Guelke, L., and Shell, R. 1992. Landscape of Conquest: Frontier Water Alienation and Khoikhoi Strategies of Survival,1652-1780. *Journal of Southern African Studies.* 18(4), 803-824.

Haraway, D. 1988. Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective. *Feminist Studies.* 14(3), 575-599

Haraway, D. 1990. *Simians, Cyborgs, and Women: The Reinvention of Nature*. New York: Routledge.

Haraway, D. 2003. *The Companion Species Manifesto: Dogs, People and Significant Otherness.* Chicago: Prickly Paradigm Press.

Haraway, D. 2008. *When Species Meet*. Minneapolis: University of Minnesota Press.

Haraway, D. 2015. Anthropocene, Capitalocene, Plantationocene, Chthulucene: Making Kin. *Environmental Humanities.* 6, 159-165.

Haraway, D. 2016a. *Staying with the Trouble: Making Kin the Chthulucene.* Durham: Duke University Press.

Haraway, D. 2016b. *Story Telling for Earthly Survival.* [Online] Available from: https://vimeo.com/189163326 [Accessed 20 December 2018]

Haraway, D., Ishikawa, N., Gilbert, S., Olwig, K., Tsing, A. and Bubandt, N. 2016. Anthropologists Are Talking – About the Anthropocene. *Ethnos*. 81(3), 535-564.

Harvey, P. and Knox, H. 2012. The Enchantments of Infrastructure. *Mobilities*. 7(4), 521-536.

Hastrup, K. 2014. *Anthropology and Nature.* New York: Routledge.

Hetherington, K. 2019. *Infrastructure, Environment and Life in the Anthropocene*. Durham: Duke University Press.

Hickley-Moody, M. 2015. Slow Life and Ecologies of Sensation. *Feminist Review*. 111, 140-148.

Hoffman, M. T., Bond, W. J. and Stock, W. D. 1995. Desertification of the Eastern Karoo, South

Africa: Conflicting Paleoecological, Historical, and Soil Isotopic Evidence. *Environmental Monitoring and Assessment*. 37, 159-177.

Ingold, T. 2011. *Being Alive: Essays on Movement Knowledge and Description*. New York: Routledge.

Ingold, T. 2013. *Making.* London: Routledge.

Ingold, T. and Vergunst, J. (eds.) 2008. *Ways of Walking: Ethnography and Practice on Foot*. Surrey: Ashgate Publishing Limited.

Instone, L. 2014. Unruly grasses: Affective attunements in the ecological restoration of urban native grasslands in Australia. *Emotion. Space and Society*. 10, 79-86.

Isaiah 40:6-8, The Bible: New King James Version.

Jensen, C. B. and Morita, A. 2015. Introduction: Infrastructure as Ontological Experiments. *Ethnos.* 82(4), 615-626.

Jorritsma, M. 2012. "Don't Frack with Our Karoo": Water, Landscape, and Congregational Song in Kroonvale, South Africa. *Safundi. The Journal of South African and American Studies*. 13(3-4), 373-391.

Kirksey, S. and Helmreich, S. 2010. The Emergence of Multispecies Ethnography. *Cultural Anthropology.* 25(4), 545-76.

Klein, N. 2014. *This Changes Everything: Capitalism vs. the Climate.* New York: Simon and Schuster.

Kohn, E. 2007. How Dogs Dream: Amazonian Natures and the Politics of Transspecies Engagement. *American Ethnologist.* 34(1), 3–24.

Kohn, E. 2013. *How Forests Think: Toward an Anthropology Beyond the Human*. University of California Press.

Kolbert, E. 2014. *The Sixth Extinction. An Unnatural History.* New York: Henry Holt and Company.

Latour, B. 2004. Why has Critique Run Out of Steam? From Matters of Fact to Matters of Concern. *Critical Inquiry*. 30(2), 225-248.

Latour, B. 2013. *An Inquiry into Modes of Existence: an Anthropology of the Moderns*. Cambridge: Harvard University Press.

Latour, B. 2014. Another way to compose the common world. *Journal of Ethnographic Theory.* 4(1), 301-307.

Lien, M. 2017. Unruly Appetites: Salmon Domestication "All the Way Down". In: Tsing, A. Swanson, H., Gan, E., and Bubandt, N. (eds.). *Arts of Living on a Damaged Planet.* Minneapolis:

Minnesota University Press, M107-M124.

Lien, M., and Law, J. 2011. 'Emergent Aliens': On Salmon, Nature, and Their Enactment. *Ethnos*. 76(1), 65-87.

Lyons, K. M. 2014. Soil science, development, and the "elusive nature" of Colombia's Amazonian plains. *Journal of Latin American and Caribbean Anthropology*. 19(2), 212-236.

Lyons, K. M. 2016. Decomposition as Life Politics: Soils, Selva, and Small Farmers under the Gun of the U.S.-Colombian War on Drugs. *Cultural Anthropology.* 31(1), 56-81.

Marais, D. and du Toit, J. n.d. Progressive Farmers in Graaff-Reinet. *Karoo Space*. [Online]. Available from: http://karoospace.co.za/progressive-farmers-of-graaff-reinet/ [Accessed 20 December 2018].

Mathews, A. S. 2017. Ghostly Forms and Forest Histories. In: Tsing, A. Swanson, H., Gan, E., and Bubandt, N. (eds.). *Arts of Living on a Damaged Planet.* Minneapolis: Minnesota University Press, G145-G156.

MacPhee, R. D. E. (ed.). 1999. *Extinctions in Near Time: Causes, Contexts, and Consequences.* New York: Kluwer Academic/Plenum.

Mbembe, A. 2003. Necropolitics. *Public Culture.* 15(1), 11-40.

Melville, E. 1994. *A Plague of Sheep: Environmental Consequences of the Conquest of Mexico* Cambridge: Cambridge University Press

Milton, S.J. and M.T. Hoffman. 1994. The application of state-and-transition models to rangeland research and management in arid succulent and semi-arid grassy Karoo, South Africa. *African Journal of Range and Forage Science.* 11, 18-26.

Mol, A. 2002. *The Body Multiple: Ontology in Medical Practice.* Durham, N.C. and London: Duke University Press

Moore, J. 2016. Introduction. In: Moore, J. (eds.). *Anthropocene or Capitalocene? Nature, History and the Crisis of Capitalism*, Oakland CA: Kairos PM Press. 1-11.

Muigai, A. W. T. and Hanotte, O. 2013. The Origin of African Sheep: Archaeological and Genetic Perspectives. *The African Archaeological Review.* 30(1), 39-50.

Nattrass, N. and Conradie, B. 2013. Jackal Narratives and Predator Control in the Karoo, South Africa. University of Cape Town: *Centre for Social Science Research.* 1-37.

Nattrass, N. and B. Conradie. 2015. Jackal Narratives: Predator Control and Contested Ecologies in the Karoo, South Africa. *Journal of Southern African Studies*. 41(4), 753-771.

Natrass, N., Conradie, B., Drouilly, M. and O'Riain, M. J. 2017. A brief history of predators, sheep

farmers and government in the Western Cape, South Africa. University of Cape Town: *Centre for Social Science Research.* 1-26.

Naveh, Z. 2000. The Total Human Ecosystem: Integrating Ecology and Economics. *BioScience*. 50(4), 357-361.

Nel, E. and Hill, T. 2008. Marginalisation and demographic change in the Karoo, South Africa. *Journal of Arid Environments*. 72, 2264-2274.

Nixon, R. 2011. *Slow Violence And The Environmentalism Of The Poor.* Cambridge MA: Harvard University Press.

Oxford Dictionary, n.d. *Transhumanism.* [Online]. Available from: https://en.oxforddictionaries.com/definition/transhumanism [Accessed 20 December 2018].

Phakathi, B. 2019. Wool Industry Urged to Diversify Export Markets. *BusinessDay.* [Online] Available from: https://www.businesslive.co.za/bd/national/2019-04-24-wool-industry-urged-to-diversify-export-markets/ [Accessed 15 August 2019]

Pitt, H. 2015. On showing and being shown plants - a guide to methods for more-than-human geography. *Area*. 47(1), 48-55.

Povinelli, E. A. 2017. The Three Figures of Geontology. In: Grusin, R. (ed.) *Anthropocene Feminism.* Minneapolis: University of Minnesota Press. 49-64.

Roche, C. 2008. 'The Fertile Brain and Inventive Power of Man': Anthropogenic Factors in the Cessation of Springbok Treks and the Disruption of the Karoo Ecosystem, 1865-1908. *Africa.* 78(2), 157-188.

Rose, D., van Dooren, T., Crulew, M., Cooke, S., Kearnes, M., and O'Gorman, E. 2012. Thinking Through the Environment, Unsettling the Humanities. *Environmental Humanities*. 1, 1-5.

Rose, D. 2004. *Reports From a Wild Country*. Sydney: University of New South Wales Press

Roux, P.W. and Vorster, M. 1983. Vegetation change in the Karoo areas. Proceedings of the Grassland. *Society of Southern Africa.* 18, 25-29.

Sadr, K. 2008. Invisible Herders? The archeology of Khoekhoe pastoralists. *Southern African Humanities.* 20(1), 179-203

Savory, A. 1983. The Savory Grazing Method or Holistic Resource Management. *Rangelands*. 5(4), 155-159.

Savory, A. 2005. *What Is Holistic Grazing?* [Online] Available from: https://www.savory.global/wp-content/uploads/2017/02/about-holistic-planned-grazing.pdf [Accessed 20 December 2018].

Sayre, 2004. Viewpoint: The Need for Qualitative Research to Understand Ranch Management.

Range Management. 57, 668-674

Scott, J. C. 1998. *Seeing Like a State: How certain schemes to improve the human condition have failed*. New Haven: University Press.

Seymour, C. L. and Dean, W. R. J. 1999. Effects of heavy grazing on invertebrate assemblages in the Succulent Karoo, South Africa. *Journal of Arid Environments*. 43, 267–286.

Shaw, J. 1875. On the changes going on in the vegetation of S.A. through the introduction of the Merino sheep. *Journal of the Linnean Society*. 14, 202-208.

Shiva, V. 2009. Soil Not Oil. Environmental Justice in an Age of Climate Crisis. *Alternatives Journal*. 35(3), 19-23.

Skinner, J. D. 1993. Springbok (Antidorcas marsupialis) treks. *Transactions of the Royal Society of South Africa.* 48, 291–305.

Smet, M. and Ward, D. 2005. A comparison of the effects of different rangeland management systems on plant species composition, diversity and vegetation structure in a semi-arid savanna. *African Journal of Range and Forage Science*. 22(1), 59-71.

Svenning, J. 2017. Future Megafaunas: A Historical Perspective on the Potential for a Wilder Anthropocene. In: Tsing, A. Swanson, H., Gan, E., and Bubandt, N. (eds.). 2017. *Arts of Living on a Damaged Planet.* Minneapolis: Minnesota University Press. G67-G86.

Taylor, A., Pacini-Ketchabaw, V., de Finney, S. and Blaise, M. 2015. Inheriting the Ecological Legacies of Settler Colonialism. *Environmental Humanities*. 7, 129-132.

Tsing, A. 2012a. Unruly Edges: Mushrooms as Companion Species. *Environmental Humanities.* 1,141-154.

Tsing, A. 2012b. Contaminated Diversity in 'Slow Disturbance': Potential Collaborators for a Liveable Earth. In: Martin, G., Mincyte, D. and Münster, U. (eds.). *Why Do We Value Diversity? Biocultural Diversity in a Global Context.* RCC Perspectives. 9, 95–97.

Tsing, A. 2014. More-than-human sociality: a call for critical description. In: Hastrup, K. (ed.) *Anthropology and Nature.* New York: Routledge, 27-42.

Tsing. A. 2015. *The Mushroom at the End of the World: On possibilities of life in Capitalist Ruins*, New Jersey: Princeton University Press.

Tsing, A. 2016. Earth Stalked by Man. *The Cambridge Journal of Anthropology,* 34(1), 2-16.

Tsing, A. Swanson, H., Gan, E., and Bubandt, N. (eds.). 2017. *Arts of Living on a Damaged Planet.* Minneapolis: Minnesota University Press.

van der Merwe, L. 2015. The Anti-Frackers. An Ethnographic Account of the South African Fracking

Debate. *Unpublished Master Thesis*. University of Cape Town: Cape Town.

van Dooren, T. and Rose, D. B. 2016. Lively Ethnography: Storying Animist Worlds. *Environmental Humanities.* 8(1), 77-94.

van Sittert, L. 2002. Holding the Line: The Rural Enclosure Movement in the Cape Colony, c. 1865-1910. *Journal of African History.* 43, 95-118.

Yong, E. 2018. Humans are destroying animals, ancestral knowledge. *The Atlantic.* [Online] September 6, 2018. Available from: https://www.theatlantic.com/science/archive/2018/09/to-save-animals-we-need-to-save-their-knowledge-too/569503/ [Accessed 20 December 2018].

Whatmore, S. 2006. Materialist returns: practising cultural geography in and for a more-than-human world. *Cultural Geographies*. 13, 600-609.

Whatmore, S. 2014. Political Ecology in a More-Than-Human World: Rethinking 'Natural' Hazards. In: Hastrup, K. (ed.) *Anthropology and Nature*. New York: Routledge. 79-95

Wiegand, T. and S. Milton. 1996. 'Vegetation change in semiarid communities: simulating probabilities and time scales', Vegetation, 125.