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Mountain biking in the (Neg)Anthropocene: Encountering, witnessing, and reorienting to the end of the 'Natural' world

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Mountain biking in the (Neg)Anthropocene: Encountering, witnessing, and reorienting to the end of the ‘Natural’ world

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Abstract

This chapter argues that mountain biking can serve to both mitigate the trauma associated with ‘Nature’s’ destruction, whilst helping to imagine a range of ‘post-natural’ futures. Drawing on the recently translated works of Bernard Stiegler, it contends that the negentropic qualities of mountain bike culture comprise a performative response that enables practitioners to encounter, witness, and reorient to the contemporary current climate crisis. In particular, it proffers that it is the very uncanniness of the mountain bike as a technological artifact that renders an experience that is both constitutive of, and distanced from, the surfaces, materials, and environments with which it interacts. With this in mind, mountain bikes, and mountain bike trail building tools, are positioned as ‘therapeutic prescriptions’ that facilitate practices of care and attention within a specific social system, whilst assuaging the nihilistic discourse of existing Anthropocene thinking. These care-ful practices, which include getting ‘dirty’, and the active enrolment of non-human labour, as well as the collective conversations and contestations that stem from these, are argued to facilitate more deliberative relationships with the environment, whilst engendering new and emerging forms of (onto)political subjectivity that are made to the measure of the (Neg)Anthropocene.

Introduction

In November 2021, the world waited in anticipation to hear the outcome of the latest Conference of the Parties of the UN Framework Convention on Climate Change

(UNFCCC), otherwise known as ‘COP26’. This convention came at a critical time in our earth’s history. Since the 19th century, the planet has warmed by 1 degree, and, if this change in temperature continues, it will have catastrophic consequences on human and non-human life (IPCC 2021). Yet, for all its pomp and circumstance, the occasion had a familiar sense of déjà vu. Despite the Paris agreement in 2015, global temperatures have continued to soar, and in the 33 years following the formation of the International Intergovernmental Panel on Climate Change (1988), we have emitted as much greenhouse gas as we had since the beginning of the industrial revolution (Griffin 2017). Moreover, critical reflections on the outcomes of COP26 suggest that global leaders remain steadfast in their commitment to capitalist growth and the various neoliberal, ecomodernist, and technocentric solutions with which this ideology is aligned.

The question frequently asked regarding this matter is why we continue to do so little, so late? This was evident in Greta Thunberg’s impassioned repose at COP25, where she accused climate and business leaders of clever accounting and creative PR which, she added, made it look like real action was happening when ‘almost nothing is being done’ (BBC 2019). Ambitious words and promises are good, write Hare and Hohne, but in the wake of COP26, ‘one must ultimately judge governments by their actions’ (2021). To which they add: ‘Their action on near-term targets so far falls well short of what’s needed and is indeed inconsistent with most of the net zero targets on the table’ (Hare and Hohne 2021). Here, we might highlight two familiar obstacles to climate action, which I seek solutions to in this chapter.

Firstly, the Anthropocene, which brings with it the ‘end of nature’, is a time of immense complexity and bewildering change. As Purdy writes in his book *After Nature*, the Anthropocene ‘begins with the realisation that, after nearly ten thousand years of relatively stable climate and burgeoning human wealth, ecological systems are intensely stressed, and that their health or collapse ... is substantially down to human choices’ (2015, 17). In the modern world, all we had to do was to maintain faith in progress, stay a safe distance from nature, and to focus on our individual wellbeing, but in the Anthropocene such guarantees violently implode, leaving us feeling distinctively fragile and uneasy.

Secondly, and relatedly, the magnitude of these issues is matched only by the impotence of existing political intervention (Meyer 2020). Accordingly, we find a whole spectrum of responses, from scepticism to optimism, all with a common denominator: they all have a sense that something is devastatingly wrong but cannot find the words, or actions, that would help explain it. It is perhaps for this reason why so many of the world's population feel pessimistic about the future, with 56% of British and 65% of French citizens now expecting Western civilization to collapse within the next 10 years (Servigne et al. 2021).

In what follows, I argue that physical activity, and specifically mountain biking, can serve to address these anxieties, whilst at the same time helping to imagine a range of 'post-natural' futures. Bringing together a number of recent publications, and drawing on over five years of fieldwork with mountain bikers, electric mountain bikers, trail builders, and mountain bike advocates, I contend that the negentropic (Stiegler 2018) qualities of mountain bike culture comprise a performative response adequate to the challenges arising from our current climate crisis, specifically those relating to the threat of 'contemporary concrescence' (Ross 2018, 31). In particular, I proffer that it is the very 'uncanniness' (Morton 2016) of the mountain bike as a technological artifact that renders an experience that is both constitutive of, and distanced from, the surfaces and materials with which it interacts. With this in mind, mountain bikes, as a particular form of off-road travel, are positioned as 'therapeutic prescriptions' (Stiegler 2018, 34) that facilitate practices of care and attention within a specific social system, whilst assuaging the nihilistic discourse of existing Anthropocene thinking. As opposed to being simply subjective (i.e., human-centred resilience), these care-ful practices – which includes getting 'dirty', and the active enrolment of non-human labour as well as the collective conversations and contestations that stem from these – are argued to facilitate more deliberative and open relationships with the environment, whilst engendering new and emerging forms of (onto)political subjectivity that are made to the measure of the Neganthropocene (Stiegler 2018).

Sport in the (Neg)Anthropocene

Since the industrial revolution, human beings have made an indelible mark on the geologic landscapes of Earth (Bonneuil and Fressoz 2017). After more than 12000 years of intense agriculture, industrialisation, population growth and mass urbanisation, every corner of the globe, and every layer of the stratosphere, bears the scars of human activity. CO₂ from fossil fuels fills the atmosphere, non-degradable plastics and human effluent pollute the oceans, and the excesses of human consumption, manifest through things such as the recently discovered ‘plastiglomerate’ (Corcoran and Jazvac 2020) (an amalgam of rock and melted plastic), serve as geological reminders of humankind’s catastrophic, and irreversible impact on the earth’s crust. At the same time, there is also unprecedented levels of *extraction* (Dunker and Chakrabarty 2020). Every year almost 90 billion tons of biomass, fossil energy, metal and minerals are removed from the earth, which equates to more than 11 tons for every single person on the planet (The World Counts 2021), and this is more than could ever be accommodated, by ‘natural’ systems. It is in this context that scholars across a number of disciplines are beginning to dispense with the realist vision of ‘Nature’ and are instead trying to (re)imagine how these spaces might be perceived, enacted and addressed within the Anthropocene: that is, an era within which humans and nature converge, comingle, and intra-act (Heyd 2020).

The Anthropocene renders a dual crisis in existing social, ecological, and political relationships with the planet. Firstly, we are seeing an increasing lack of confidence in nature with a capital ‘N’, or rather, of a nature that is free, autonomous, and separated from human activity. Nicole Karafyllis (2020) has proposed the term ‘biofact’ to designate and explain those emerging aspects of the environment, such as polluted rivers and litter-covered mountains, whose origin and formation has been anthropogenically influenced – directly or indirectly – irrespective of the actual visibility of that influence. These biofacts alter the ontological essentialism that was once so readily attributed to natural phenomena such as rain, dirt and deserts, since:

The natural and artificial have merged at every scale. Climate change makes the global atmosphere, it’s chemistry and weather systems, into Frankenstein’s monster – part natural, part made. The same is true of the seas, as carbon absorption turns

the oceans acidic and threatens everything that lives in them ... Even wilderness, that emblem of untouched nature, persists where lawmaking and management create it... (Purdy 2015, 15)

The implications of this catastrophe are not simply environmental, but social, moral, cultural, and political. As a result, they pose a number of questions regarding the tendencies of 21st century living (i.e., consumerism, neoliberalism), the (in)adequacy of modern institutions (i.e., the nation state) and the discourses from which these derive (science, management, ecology). Writing on climate change, Campbell et al. (2018) suggest that such phenomena reveal new contours within the human condition, whilst presenting extreme organisational challenges. Climate change is therefore defined by its unframeable, unbounded, incalculable, unthinkable qualities, and calls forth ‘forms of organisation without any precedent’ (Campbell et al. 2018, 2).

In sport and physical culture, one does not have to look far to find such ruptures in romantic and ideological versions of nature, as well as the various organisational crises that accompany these. For instance, via an impressive body of work spanning over 3 years, Orr (2018, 2020, 2021) has addressed the various hazards of climate change and their impact on organised sports. Zoning in on a variety of activities, from baseball and cross-country skiing (Orr 2020), to soccer (Ross and Orr 2021), and athletics, Orr’s findings illustrate the manifold ways in which warmer temperatures and increased precipitation, as well as extreme weather events such as fires and flooding, can disrupt professional competitions, resulting in their postponement or cancellation. In less structured and competitive contexts, Evers (2021) contends that pollution, in the form of nuclear waste or carcinogenic chemicals, complicates health-led discourses that attribute positive transformations to blue spaces such as rivers and oceans. In focusing specifically on surfing in Fukushima (Japan), he writes that while participants may feel an emotional and corporeal lift after being in the sea, such benefits are nonetheless negotiated against a backdrop of ‘toxic natures’ (Evers 2021, 185), which render new skills, tasks, values, and orientations.

This interplay, between the homogenisation of human and non-human, on the one hand, and the ontological entanglement of the organic and artificial, on the other, represents what Bernard Stiegler describes as the entropic and negentropic qualities of human life in the 21st century (Stiegler 2018). Indeed, it is these pharmacological qualities that I wish to draw attention to in the analysis of mountain biking presented herein.

Extending his earlier work on technics, technology, and hyper-industrialisation, Stiegler (2018) adopts the language of thermodynamics to argue that the Anthropocene represents a closed system (i.e., entropy), in which desire for all social and deliberative activity is increasingly being replaced by instinctual drives, which in turn lead to automatic, present-centred, and nihilist forms of behaviour. Such nihilism is nourished by both the allures of consumer capitalism, which promise immediate gratification through the purchasing of various goods and experiences, and new informational technologies, which subject human beings to calculative, algorithmic processes ‘whose purpose is the operational reduction of difference’ (Abbinett 2018, 105). For Steigler (2018), this amounts to a collective existential crisis involving the decay of both psychic individuation (knowledge) and collective individuation processes (socialisation). However, it is also causing a crisis on a planetary scale, and has dire consequences for the biosphere, since the ‘natural’ world ‘is unable to cope with the drive of the globalised socio-economic system that operates on the basis of uncontrollable individuals who have no sense of the need to defer their wants (desire) into the future, but are instead possessed by the drives to have everything now’ (Featherstone 2019, 3).

In contrast to much work on the Anthropocene, which suggests that humans have an ‘entropic essence’ (Steigler 2018, 57), Stiegler’s (2013) writings remain stubbornly optimistic, owing to the ‘pharmacological’ qualities of this era. Whilst all living things participate in local increases in entropy, they can also, at the same time, produce forms of negative entropy (i.e., negentropy) that counterbalance these tendencies. In this sense, the greatest contradiction of the Anthropocene is that the more it short-circuits social and natural systems, the more we are confronted by its own limits, which reveal how excessive forms of consumption are themselves reliant on the natural resources and public

engagement that they concurrently destroy (Stiegler 2018). This is most evident in those forms of scholarship which highlight the Janus-faced qualities of sporting institutions, such as the International Olympic Committee, whose green credentials are exposed when metals and harmful chemicals infiltrate swimming venues (McDonald and Stirling 2021), or when governments deliberately manufacture clear skies to live up to their environmental pledges (McLoud et al. 2018). It is also highlighted when Formula One drivers, who's sport is estimated to contribute approximately 256,000 tonnes of CO₂ to the atmosphere per year, complain that we are not doing enough to tackle climate change (Edgar 2020). Following these instances, issues such as air pollution, water contamination, and industrial agriculture become globally ubiquitous 'matters of concern' (Latour 2004) that are intensely scrutinised by the public, and it is through these debates that both the limits of human-centredness and the excesses of consumer capitalism are brought to our attention.

Moreover, Stiegler (2011) contends that our very being constitutes a process of exteriorization, in which our minds and bodies exist in dialogue with technical objects, including those within the world of sport and physical activity (Cherrington and Black forthcoming). These objects, such as the swimsuit and the bicycle, inspire public debate regarding moral virtue and public good, and allow citizens to construct symbolic meanings based on these ongoing negotiations. At the same time, they also provide a permanent source of differentiation and disagreement between different members of the population regarding how these technologies should be implemented in the future, a process that Stiegler (2011) refers to as individuation. For Stiegler, this is precisely the threat of the Anthropocene, and the most pressing political issue of our time, since our collective protentions are being progressively liquidated and automated, 'so that knowledge is no longer knowledge at all, but rather a set of closed systems' (2018, 51), generated by a 'massive and brutal imprinting of finitude' (Stiegler 2011, 182). This is evident, for example, in the use of artificial crowd noises in football (Turner 2014) or the commodification of multiculturalism in cricket (Powis and Velija 2020). Nonetheless, as long as our organological relationship with technology remains, the possibility for individuation will always stay open, since this relationship involves an experience of socio-technical subjectivity that is perpetually unfinished (Ross, 2018), and always open to

(re)interpretation. It is this tension that Stiegler calls the pharmakon: ‘the unity of self-consciousness’s affective and reflexive constitution that is always put back into play by the synchronous networks of hyperindustrial capitalism’ (Abbinett 2018, 61).

Therefore, in light of the above, I contest that it through the socio-technical and human-non-human assemblages, brought about by our experience of sport in the Anthropocene, which inherently produce both entropic and negentropic possibilities (Stiegler 2018). Furthermore, it could be said that even the most entropic characteristics of contemporary ecological relations facilitate a level of care towards the environment, as it is these moments that we are forced to face up to the limits of the anthropos and deliberate our collective future. What is therefore needed, according to Stiegler (2018), are social, cultural and political interventions that seek to maintain and intensify the negentropic potentials of each individual in certain situations. At the same time, we must also cultivate social diversity, that is ‘a sociodiversity that takes care of its noetic heritage – it’s languages, archives, works, knowledge and noetic exteriorities in general’ (Stiegler 2018, 79). Here, Stiegler highlights the importance of creating a territorial dynamic, or a cohesive social body, that is facilitated by the individuated interactions that take place in a given space. Indeed, by reinvigorating local knowledges and representative bodies through sport and physical activity, it is argued that we can bring back particular ways of life that are grounded in specific corporeal, symbolic, and cultural modalities that serve to motivate and sustain collective practices of (ecological) care.

Encountering, witnessing, and orienting to (the end of) nature sport

In addressing the issues outlined above, this chapter takes inspiration from the writings of Anna Tsing (2015) and Blanche Verlie (2021), whose empirical investigations of capitalist catastrophe and climate change respectively, provide insights into how mountain biking might help people to encounter, witness and (re)orient to ‘the end of nature’. For both authors, the resilience required to overcome the trauma of pollution, climate change and ecocide is not located within the individual human agent, but within the symbiotic attachments that are generated through our engagements with other humans and non-

humans. As Tsing suggests: ‘If survival always involves others, it is also necessarily subject to the indeterminacy of self-and-other transformations’ (2015, 29). Addressing these various catastrophes begins from an understanding that climate and ecology involve us ‘living-with’ these phenomena, in that they demand actions or processes of living-with ourselves, (both human and non-human) others, and the world (2021, 14). This understanding, she continues, ‘enables us to cultivate strategies that can adequately inspire and support people to engage with and respond to climate change, and to do this in ways that contribute to multispecies climate justice’ (Verlie 2021, 14).

Accordingly, Tsing and Verlie provide a blueprint for how cultures of leisure and physical activity could serve to (re)emphasise and recentre our relationship with nature, whilst at the same time examining how cultural mechanisms and dominant ideologies have disrupted our ability to understand, and to a certain extent control, a range of technical assemblages. On this point, I remain critically distanced from emerging posthuman, or new materialist analyses of sport and physical activity, which attempt to decentre the human subject, whilst locating social agents within a range of material, technological, and animal assemblages (see Black and Cherrington forthcoming; Thorpe et al. 2020). Indeed, whilst this chapter works from the premise that less anthropocentric readings of leisure and technology are needed, I also contend, as per the Stieglerian framework outlined above, that the very notion of the human is founded on the exteriorization of our own mortality, and that any inner capacity for thinking or acting is always made possible by a prosthetic relationship with matter. In this sense, to attribute contemporaneous developments in nature to a period in which we have moved ‘beyond’ the human is to ignore the manifold ways in which the evolution of the human species has always and necessarily been marked by a lack of essence that is made good by technological supplements and their associated cultural supports (Abbinett 2018; Cherrington and Black forthcoming).

In this regard, as a point of difference to posthumanism, I suggest that if there is a crisis that is brought about by the advent of modern technology, it is not because something ‘natural’ or ‘human’ is supplanted by something technological. Rather, it is because there

has been a transformation in technics itself; a transformation that has been brought about, in part, by a radical change in the political economy of contemporary leisure.

In her work on climate change, Verlie (2021) identifies three interrelated processes that compliment such negentropic thinking. Firstly, she highlights the importance of *encountering* the destabilisation of the climate, via a range of embodied, sensuous and affective stimuli. These ‘affective atmospheres’ (Verlie 2021, 33) help us to attune to the physical and corporeal relationships that form the basis of human-non-human assemblages, whilst sensing how, for better or for worse, such assemblages can change and morph over time. Indeed, climate affects are distributed in dynamic, yet predictable ways, and when these affects are disturbed or interrupted these can often be felt in the embodied and more-than-human relationships that compose our experience of various environments (Ingold 2011). For instance, although industry exterminates impurities from the environment, plantations grow monocultures and reduce ecological diversity, and modern dairy and meat farms raise a handful of domesticated breeds in captivity, physical activity, as an immersive and embodied undertaking, has been shown to rekindle some of these relationships in surprising and unexpected ways (see, for example, King and Weedon’s [2020] ecological analysis of whey protein). In addition, sketching out the somatic qualities of these physical and material encounters reveals how climate change and pollution not only work through bodies but also inhabit them over time and reignite in different spaces (Adams-Hutchenson 2017).

For example, as part of an ongoing programme of research and activities that explores how people relate to, experience, and contribute to local weather worlds within the context of changing climate, Bell et al. (2019) have examined how people with varying forms of sight impairment describe their experience of nature during various outdoor activities, with the weather emerging as an immediate and often highly instinctual form of everyday encounter. In particular, the ephemeral qualities of people’s weather-worlds emphasise their potential to invigorate and connect, but also to disorientate, threaten and isolate, at times supporting moments of well-being or exacerbating experiences of impairment and disability. In addition, participants articulated how the elements (i.e., wind, snow) can be

experienced as comforting and life-giving, enhancing sleep quality and reducing the feelings of isolation and disconnection that can be experienced with sight impairment. Yet, in other instances various weather, elements, particularly wind and rain, were found to be disorientating, painful and disabling. In the context of extreme weather events, such as wildfires, Verlie notes how such affective reactions can be even more intense, as the toxic mixture of ash and smoke that fills the air can facilitate emotional responses that are stimulated by ‘feeling other people’s feelings in the air’ (2021, 36).

In recognising these *encounters*, we must also be willing to *witness* a variety of environmental realities (Verlie 2021). Here, witnessing involves the sharing of different narratives and points of view, which illustrate the plural, diverse and unique circumstances through which different people and collectives come to terms with a range of environmental catastrophes. Witnessing the end of nature thus carries with it a commitment to human and non-human others that is bound to a particular social, cultural, or affective milieu. Yet such commitments are different to the civic communitarianism outlined in Monbiot’s *Out of the Wreckage* (2017), in which the good life is narrowed to the considerate conduct of the (human) individual in their local time and place. Instead, witnessing is based on the acceptance of a shared sense of indeterminacy, or rather, precarity; a feeling that we are equally, and ubiquitously, subject to the instability of shifting relations, which constantly remake ourselves and others (Tsing 2015). Here the role of physical activity is to provide a hypercommunity (Black and Cherrington 2021); that is, a sense of togetherness that corals around a practical endeavour, foregrounding how different beings are separate and unique but still bound to one another through their ‘ghostly’ (Tsing et al. 2017) or ‘spectral’ (Cherrington and Black 2021) co-presence, which manifests in specific places and environments. When practiced away from the strictures of modernist institutions, as witnessed in some contemporary lifestyle sports, such relations can also facilitate an *improbable*, rather than a *determinist*, orientation towards the future (Stiegler 2018), as they allow participants to engage, and experiment with, a range of other timescales and temporalities.

Taken together, both encountering and witnessing entropy raises fundamental questions regarding ‘the future of knowledge in all its forms’ – knowledge of how to live, do, conceptualise, spiritualise, that is, interpret’ (Stiegler 2018, 81) within the (Neg)Anthropocene. Concomitantly, these experiences make way for a ‘bleak’ form of optimism (Campbell et al. 2018, 1) that reminds us that although we live in a terrifying time, ‘it is also one that can be sobering and even energizing, precisely because everything is at stake’ (Dunker 2020, 2). So, what happens next? And what political shifts are required to adjust to a world where orthodox notions of nature no longer exist?

First, I argue that we need to slow down and listen to the world, both empirically and imaginatively, in a manner akin to the ‘slow’ forms of leisure that emerged during the course of the global COVID-19 pandemic. These activities, such as casual walking and slow swimming, prioritise local adventures and provide a counterpoint to risk-managed and ‘fast’ forms of sport that focus predominantly on the thrill and conquer mentalities of mainstream recreational experiences (Breunig 2020). Second, we need to enable deliberative processes to be set up that facilitate new relationships and generate local forms of knowledge that are capable of engendering negentropy (Stiegler 2018). In sport and physical activity, this may include the promotion of alternative sports, such as mountain biking, that help to engender new affective intensities, experiences, and embodiments, whilst moving beyond the highly regulated, regimented and surveilled environments of traditional sport. Finally, we must consider how new forms of exosomatization (relationships with technology) and endosomatization (ways of feeling) may be locally articulated and organised via new organological relations (Stiegler 2018). In the sections that follow, I attempt to map out how mountain biking, as a unique form of negentropic practice, can help in achieving these political ends.

Encountering nature’s ‘spectrality’

Data from my research reveals the phenomenological qualities of ‘nature’ exposure in the context of mountain biking, electric mountain biking and mountain bike trail building. In

particular, participants highlighted the sensuous qualities of riding in, and building with, dirt:

... it's not just dirt that's been dug from the floor, but also just the whole appreciation of it, that you can mould it, shape it sculpt it. The sound it makes when you push through with your tyres hard into a corner. The contact with your tyre on the dirt. When I'm going out that is one of things I am looking for, because I love that sound. It's just an appreciation for what it is and what it allows us to do (Andy)

Ultimately it comes down to whether it's thin dirt, thick dirt, non-sticky dirt, animal dirt, which is actually smelly dirt. And then there are variations of stuff that the council give you which is either gravel or extra stuff that hangs together well. Or if you like rolling hills there is the stuff they build features with and shape stuff with which is basically sand (Steve)

Mountain biking is one part of a delicate and emergent assemblage involving non-humans and other socio-natural configurations (Stiegler 1998), whereby the participants ability to bring something into being (i.e., an enjoyable ride or a rideable trail) demands a perspective which situates the practitioner as being actively engaged within their environment (Ingold 2011). In the case of Andy and Steve's experiences with dirt, we learn of how the 'touch' (sticky), smell (of 'animals'), sound (of tyre), and granularity of (thick, thin or sandy) dirt work together to generate a unique sense of satisfaction and enjoyment. Central to this process is being able to 'sense' what certain kinds of dirt will, or will not, allow them to do, suggesting that the landscapes and objects of mountain biking create, or in some cases deny, particular affordances. The practical 'know how' required to ride mountain bikes and/or build mountain bike trails could thus be characterised as a process of enskillment (Ingold 2011), which, through the combination of knowledge (of the dirt) and practice (the sensuous and embodied feedback from building and riding certain trails and features), serves to locate and shape participants in relation to a series of dynamic landscape features and environmental processes.

Such enskillment requires the enrolment of various tools and technologies, which facilitated encounters (Verlie 2021) with nonhuman objects. This was particularly so in the case of trail building, where tools such as spades, diggers, ratchets, hoes, ropes, and wheelbarrows afford the participants a more efficient way of (re)moving dirt, rocks and tree trunks, whilst helping to sculpt rideable features such as berms, jumps, and tabletops. Frank, for example, described the functionality of the ‘MTR’ trail tool, which is highly valued by many builders:

For cracking through the top surface and raking off the loam, and then cracking into the sandstone underneath it’s perfect. What you’ve got is a sheet of metal on the end of a pole, with a cutting blade on one side and, not a rake but some perfect triangles that work like a rake. It’s great for raking up berms, you can temp stuff down, you can dig, you can lever, you can cut roots, you can dig through whatever you need to. As a nice simple, everyday tool it does the job perfectly.

This excerpt illustrates the importance of exosomatic memory (Stiegler 2011) in the culture of mountain biking; that is, a type of objective memory consisting of material artefacts, such as tools, that enable the conservation and transmission of individual memory, beyond the physical body, so that certain pedagogies of practice are inherited by future generations. Here, tools are deeply embedded in the riders and trail builders’ daily routines, presenting a range of transformative possibilities that inevitably (re)shape, for better or for worse, the way they understand this physical culture, as well as the bodies, identities, rituals, and everyday practices from which these cultures emerge (Thorpe et al. 2020). Specifically, the commingling of humans and technology, which is present in the participants’ accounts, reveals how certain artifacts serve to supplement, sustain, and, at times, curtail the building and riding of certain features, whilst mediating their engagement with objects such as dirt, roots, and sandstone.

However, the use of tools in mountain bike culture should not be seen as a way of riders and trail builders developing a ‘mastery’ over nonhumans. On the contrary, participants

outlined how tool use led to an overwhelming sense of ‘lameness’ (Morton 2013) when being exposed to the ‘symbiotic real’ (Morton 2017):

With the dirt being mostly clay and roots here what you find is even when I’ve been in with a machine, I have to have the bucket with teeth on, and I don’t so much dig as keep scraping with the teeth. This clay has been in the ground for hundreds of years, and when you combine it with rain it gets heavy and gloopy. Even though the digger won’t physically push into it I have to use the teeth to break away 4-inch bits then smooth it out. When we changed that trail (points to map) I had what’s called a diking bucket on which is a 2x5 bucket, and it’s hard. It’s literally lifting the digger up because it’s that hard. (Jason)

The symbiotic real comprises an ecological arrangement in which wholes (i.e., ‘Nature’) are subsceded by their parts (i.e., clay, rain, diggers, dyking buckets etc.) (Morton 2017). It is feeling that Nature – once so ontologically obvious – now only appears as a spectre, wavering ‘between appearance and being’ (Morton 2017, 55). The participants exposure to this symbiotic real bring forth the negentropic (Stiegler 2018) capacities of mountain biking, since the more mountain bikers and mountain bike trail-builders try to think about trails, ‘the more they find themselves ‘on the insides of much bigger places than those constituted by humans’ (Morton 2017, 26). However, what marks this study out from others, and what the work of Stiegler (2011, 2018) helps to elucidate, is that these discoveries are made in the presence, rather than the absence of technology in supposedly ‘natural’ environments. Indeed, it is through the utilisation of various tools that individuals make a formative connection between ‘organic’ and ‘artificial’ objects, whose evolution is a constant re-articulation of both their difference and their dependency (Abbinett 2018).

A common sentiment, in this respect, was the importance of ‘knowing one’s location’ (Rob) and ‘working with what you have got at different sites’. For instance, whilst cultivating an earthly connection through the skilful craft of trail building, many participants spoke of the disruptions caused when unearthing historical artifacts, often referred to by interviewees through the formal vernacular of ‘SSSIs’ (Sites of Special

Scientific Interest). Individuals also referred to the unique geologic history of their building location and the logistical challenges that these locations can pose:

Because of the nature of X (location) there are loads of charcoal halves which we do our best to avoid. They used to burn a hell of a lot of timber to make charcoal, and when they'd finished you end up with these 3-foot-deep beds of black soot that is slowly decomposing. If you accidentally hit one of those it's best to try and find the edge of it and build the track around it because you are never going to build a track through it (Robert)

There are lots of planning issues that most builders are completely unaware of. Like X (location) is littered with WW1 trenches, so we have to be careful where we go. You have to be aware of the past. (John)

These concerns show how skilled trail builders must pay attention to a particular site's terrains and geologies within which their activities take place, as well as the human-non-human assemblages that emerge within these sites, which reflects Stiegler's (2018) call for more local initiatives in the resistance of entropic destruction. Of notable interest here is the way in which mountain biking serves to guarantee 'relations of scale between orders of magnitude respectful of localities and of the heterogeneity that they alone provide' (Stiegler 2018, 136). Indeed, while Robert, John and Harry engage in instances of material mediation, their lived space is transformed from a harmonious marriage of various affects into an 'agitated history' (Latour 2018, 42) in which participants are reacting to an assemblage of other reactions (i.e., charcoal halves and WW1 trenches) that extend across other times and spaces. In digging sculpting and re-purposing dirt, trail builders explore its sedimented layers, which bear visual and sensuous reminders of our past, forcing them to be vigilant about how these events were enacted, as well as how they might be perceived (and re-purposed) in the present. Consequently, the participant's activities foster a sense of responsibility, which, according to George, encourages people to 'have some sort of ownership of the space they are in, leading to an increased likelihood that they will look after it'.

Collective becoming and noopolitics

Conversations regarding where to ride and build trails are common in mountain bike discourse. Magazines and internet forums are awash with conflict both within the mountain bike community, and between different users of the outdoors (Brown 2012). When asked about this during the interviews, the participants reflected on when and where it was appropriate to ride to avoid social conflict and erosion. For instance, Steve described the seasonality of riding in different locations:

For me it's about the condition of the trail. As an example, X is a bridleway, and though I am very happy to ride it in the summer, I wouldn't go near it in the winter because there are plenty of stone-clad footpaths that are perfectly good to ride. So, it comes down to what damage you are doing by being there. My friends and I are constantly debating where is and isn't appropriate to ride at different times of the year.

Duncan, on the other hand, talks about the social considerations that need to be made when choosing where to ride:

...if you go to X (location) there's a great bit of descent that goes along the ridge and drops down it. It's a lovely bit of single-track and I've seen people up there on a lovely Sunday with 15 bikes and I'm like: 'why are you doing that? it's going to be crammed with walkers today!' I've ridden it in the middle of the week in September and didn't see a soul.

Steve and Duncan's comments illustrate how the endosomatic processes of digging and riding (i.e., ways of feeling) merge with the exosomatic (collective relationships with technology) concerns of mountain biking. Through a process of individuation (Stiegler 2011) individuals create their own identities in relation to shared understandings of the collective, and, thus, bear witness to a variety of environmental realities (Verlie 2021). For

example, we see how Steve's view of when to ride is constituted by the perception of damage that is being incurred by riding particular tracks and landscapes at certain times of the year, and that acceptable/unacceptable levels of damage are negotiated through collective deliberation. This is judged according to the level of precipitation during the winter (which leads to higher levels of surface disturbance and erosion), as well as the greater popularity of these routes during the warmer summer months, both of which constitute good practice in the wider mountain biking community. Similarly, Duncan is weary of certain tourist 'hot-spots' and knows to avoid these locations during busy times, such as the weekends. In both such instances, we learn how their socio-technical subjectivity is founded upon a local and endosomatic knowledge, which helps them to make judgements regarding where and when to ride.

An interesting theme, in this respect, was what participants referred to as the problem of 'trail braiding'. Trail braiding occurs when a new section of trail appears that has not been envisioned or constructed by the trail builder (Pugh 2020). Though braiding can be caused by various nonhuman factors such as the flow of water or the presence of a fallen tree, its causes are more commonly attributed to the GPS tracking software, Strava. Here, the software is said to encourage an entropic (Stiegler 2018), relationship with the environment, since riders are encouraged to navigate trails in the quickest, and most efficient way possible, whilst circumnavigating difficult obstacles. This can be frustrating for mountain bike trail builders and other users of the outdoors, as entropic attitudes frequently result in damage to features, the unnecessary build-up of water (due to ruts in unforeseen places), the migration of the trail into areas of historical and/or ecological importance, and a general disregard for other trail/land users. For Stiegler, this would constitute the Entropocene par excellence, in that Strava condemns 'psychic and collective individuation to being wiped out by a technical individuation that has become subject to a self-destructive economy ... that in turn destroys the physical mileaus of the biosphere' (2018, 43).

Notwithstanding these issues, and their importance in relation to ecological sustainability, the mountain bike was also positioned as being pharmacologically oriented in relation to

trail braiding, in that, as well as introducing entropy, it also facilitated negentropy: that is, a widening of the riders/trail builders horizons and an increase in social, technical, and ecological diversity (Stiegler 2018). For instance, Will talked about the impact that trail braiding was having on the local flora and fauna:

Bizarrely, that grassy area on the edge of X has got a quite an interesting little eco system. Because of the salt that comes of the road, they get some plants that they don't get anywhere else, so we're really keen to keep the trails from braiding off into that area and to allow the grass to flourish, because there are lots of wonderful flora and fauna.

Whilst Christine also talked about ensuring that any given trail was appropriate for its intended usership:

Braiding can be a problem as it can turn the trail into something that is unsuitable or dangerous for some riders. For example, when a trail moves it can be diverted into a big rock, or a tricky tree stump, which as well as being dangerous, can also cause problems for less experienced riders.

These excerpts represent more than just individual manifestations of altruism or selfless 'good deeds'. In anticipating the future use of different trails, Will and Christine are locating themselves within the creative possibilities of multiple assemblages, rather than fixating entirely on the immediate goal of building or riding a functional trail. This necessitates a form of protension (Stiegler 2011), in which participants make advances on what they perceive, or rather, *project* the objects they use into the future, beyond the immediacy of their own (human) experience (Ross 2018). In the two excerpts we learn that these protensions include those relating to certain flora and fauna, as well as the diversity of the mountain bike user group. Elsewhere, participants also talked about seasonal considerations such as the climatic rhythms of the earth and various regional weather patterns, as well as the composition of the trail surface. The resultant attitude is one in which there is an evident need to distance, or temporally decentre, their own building or

riding agenda, and to ‘extend outward to all manner of (conscious and unconscious) expectations’ (Ross 2018, 21) to ensure, and further maintain, the long-term integrity of the trail.

Importantly, not all participants agreed regarding what should be built or ridden in different locations. On the contrary, participants articulated a number of rifts within the mountain biking community that indicated a range of different motives and interests. Amanda suggested that some of the younger members of her trail building community have a frame of mind where ‘they are used to building MASSIVE jumps, illegally somewhere’ and ‘If it’s not a 6ft gap jump its crap’. Rob pointed to the increase in the number of ‘wild’ or ‘off-piste’ trails, whilst warning of the dangers that they pose for mountain biking advocacy, and Jason highlighted the growing debate regarding the demise of the mountain bike trail centre, adding that people are increasingly moving away from the predictable, man-made experience that they engender. Nonetheless, what each of these respondents had in common was that these attitudes were never assumed, but rather, configured as part of a process of social deliberation within which the meaning and purpose of the mountain bike is continually (re)formulated, leading to a form of ‘metastabilisation’ (Stiegler 2018) within mountain bike culture. Thus, in spite of the various disagreements outlined above, we find a ‘cultural redoubling’ (Crogan 2010, 94) of the mountain bike in which such disagreements help to compose and reorient its ongoing elaboration within a wider social and ecological milieu.

In my discussions with mountain bike advocates, these socio-natural and socio-technical complexities extended beyond the local and were helping them to imagine/enact new forms of political praxis that would help legitimate the sport within ‘natural’ outdoor spaces. Key to this was their ability to ‘bifurcate’ (Stiegler and Dunker 2020, 105), which Stiegler defines as the reconstituting a political economy that reconnects local knowledge and practices with macroeconomic circulation that enable the reorientation of territoriality at it exists at different scales, and within different localities. For example, in combining local and regional advocacy with national and international interest groups, many advocates described wanting to represent specific social, ecological and technology issues, such as,

the overuse of parts of the countryside or issues of trespassing on private land, with the global issues of enclosure, technologization (of the outdoors) and climate change/pollution. This interplay, between local, regional and macroeconomic levels encourages ‘experimental transitions’ (Stiegler and Dunker 2020, 105) within and between different mountain biking bodies, such as those currently being negotiated in relation to dated access laws, whereby mountain bikers’ campaign for greater use of the countryside, whilst recognising the (increasingly) dense interconnections between humans and nonhumans in the global networks of outdoor leisure (Cherrington 2021). This is, by necessity, a ‘slow’ project that requires a long-term perspective, independent of the short-term interests of political and economic powers, in which mountain bikers move existing political interests away from the ideological notions of aesthetic and ocular beauty so commonly attributed to outdoor spaces, and towards one that re-thinks the notion of territory whilst being open to cooperation with other user groups.

Conclusion

Mountain biking is frequently derided by various custodians of the British countryside. From an ecological perspective, conservationists warn of the damage that mountain bikes inflict on ecosystems, especially when unauthorised trails are built on sites of natural or scientific interest. Critics also claim a number of negative social impacts, such as, the increased danger of clashes between walkers and riders; the ‘spooking’ of horses; crowding on the trail; lower levels of tolerance for other users; and, the violation of social norms relating to noise, littering and codes of dress (Chui and Kriwoken 2003). Despite the inconclusive nature of this evidence, mountain bikers continue to be portrayed as the archetypal ‘anti-citizen, symbolising all that is feckless and reckless and who does not truly belong in countryside’ (Brown et al. 2014: 14). This has led to a number of challenges in integrating mountain bikers with other users and land management objectives, as well as fierce battles over who has access to public land, which have culminated in angry, physical, and at times lethal confrontations between landowners, walkers, horse-riders and off-road cyclists.

Whilst not wishing to downplay these issues, this chapter has presented a challenge to the above ideological precedent, highlighting the positive contributions that mountain bikers can make to social and environmental diversity. Drawing on Stiegler's (2018) notion of the Neganthropocene, it has explored how (e)mountain biking, and mountain bike trail building, can serve to re-open the material, corporeal, and more-than-human relationships that are increasingly closed off by the Anthropocene. Here, I posit that the presence of technology need not result in the destruction of ecological diversity. Instead, I have sought to trace the specific affective phenomenality produced by mountain bike tools in different contexts. Specifically, I have shown how the mountain bike, and different trail building artefacts, allow participants to be humbled by nature's 'spectrality' (Morton 2017), which, rather than resulting in a sense of dominance or entitlement, produces a sense of awe and lameness in the face of inconceivable complexity. Furthermore, I hope to have demonstrated that such complexity, as a form of negentropic potential, is both stabilised and increased through a form of subjective becoming that is driven by the pursuit of individuation (Stiegler 2011). Indeed, by being open to a difference of opinion (from both within and outside of the mountain bike community), and by discussing these differences at various levels of sociality (between individuals, between advocacy groups, and by expanding out to engage global institutions), mountain bikers confirm consistencies relating to ecological diversity and the use of technology that limit and sustain the conditions of their belief (Stiegler 2018).

Taken together, the negentropic themes identified in this chapter indicate how mountain biking can serve to resist the destructive shift from *adoption* to *adaptation* that is occurring within the Anthropocene (Stiegler 2011). Adoption is a process that is uniquely human; it is a process that allows us to deliberately take on new technical supplements, whilst transforming the social systems that they support, but in contemporary societies this process is being rapidly replaced via the adaptationist technologies of hyperindustrial capitalism, which threaten our capacity for retention (learning about/with technology) and protension (imagining possible futures). Like many other sports, mountain biking is not exempt from the allures of consumer capitalism and algorithmic automatisms; a point that I have alluded to elsewhere (see Cherrington and Black forthcoming). However, in serving

as a medium for the interweaving of psychic and collective protensions, and social and ‘natural’ ontologies, the mountain bike necessitates a form of attunement that is responsive to the specific socio-material assemblages of the ‘hybrid body-bike’ (Brown 2014, 26), whilst, at the same time, revealing the fragile and indeterminate interdependencies that characterise life ‘after nature’.

Reference list

Abbinnett, R. 2018. *The Thought of Bernard Stiegler: Capitalism, Technology and the Politics of Spirit*. London: Routledge.

Adams-Hutcheson, G. 2017. “Embodied Vibrations: Disastrous Mobilities in Relocation from the Christchurch Earthquake, Aotearoa, New Zealand.” *Transfers* 7 (3): 23-37.

BBC. 2019. “Greta Thunberg: ‘Almost nothing is being done’.” December 11, <https://www.bbc.co.uk/news/av/science-environment-50743083>

Bell, S.L., C. Leyshon and C. Phoenix. 2019. “Negotiating nature’s weather worlds in the context of life with sight impairment.” *Transactions of the Institute of British Geographers* 44 (2): 270-283.

Black, J. and J. Cherrington. 2021. “Community as hyperobject Exploring the ‘Spectral Plains’ of Leisure.” In *Leisure and its Communities: Rethinking Mutuality, Collective Expression, and Belonging in the New Century*, edited by Troy Glover and Erin Sharpe, 69-79. London: Routledge. pp. 69-79.

Bonneuil, C. and J.P. Fressoz. 2017. *The Shock of the Anthropocene*. London: Verso.

Breunig, M. 2020. “Slow Nature-Focused Leisure in the Days of COVID-19: Repressive Myths, Social (in)Justice, and Hope.” *Annals of Leisure Research*. Doi: <https://doi.org/10.1080/11745398.2020.1859390>

Brown, K. 2012. "Sharing Public Spaces Across Difference: Attunement and the Contested Burdens of Choreographing the Encounter." *Social and Cultural Geography* 13 (7): 801-820.

Brown, K. 2013. "Citizen or hooligan? The place of the mountain biker in the great outdoors." In *Understanding and Resolving Land Use Conflicts. Volume 1: Mountain Biking*, edited by F. Potheary. <https://www.satinonline.org/Documents/64-MTB-Brief MASTER ONLINE.pdf>

Brown, K. 2014. "Spaces of Play, Spaces of Responsibility: Creating Dichotomous Geographies of Outdoor Citizenship." *Geoforum* 55: 22-32.

Campbell, N., G. McHugh and P.J. Ennis. 2019. "Climate Change is Not a Problem: Speculative Realism at the End of Organization." *Organization Studies* 40 (5): 725-744.

Cherrington, J. and J. Black. 2020. "Spectres of Nature in the Trail Building Assemblage." *International Journal of the Sociology of Leisure* 3: 71-93.

Cherrington, J. 2021. "The Ontopolitics of Mountain Bike Trail Building: Addressing Issues of Access and Conflict in the More-than Human English Countryside." *Somatechnics* 11 (3): 322-339.

Chiu, L. and L. Kriwoken. 2003. "Managing Recreational Mountain Biking in Wellington Park, Tasmania, Australia." *Annals of Leisure Research* 6 (4): 339-361.

Corcoran, P. and K. Jazvac. 2020. "The consequence that is plastiglomerate." *Nature Reviews Earth and Environment* 1: 6-7.

Dunker, A. 2021. *Rediscovering Earth: Ten Dialogues on the Future of Nature*. New York: OR Books.

Dunker, A. and D. Chakrabarty. 2021. *Rediscovering Earth: Ten Dialogues on the Future of Nature*. New York: OR Books.

Edgar, A. 2020. "Sport and Climate Change." *Sport, Ethics and Philosophy* 14 (1): 1-3.

Evers, C. 2021. "Polluted Leisure and Blue Spaces: More-Than-Human Concerns in Fukushima." *Journal of Sport and Social Issues* 45 (2): 179-195.

Featherstone, M. 2020. "Stiegler's Ecological Thought: The Politics of Knowledge in the Anthropocene." *Educational Philosophy and Theory* 52 (4): 409-419.

Griffin, P. 2017. *The Carbon Majors Database: CDP Carbon Majors Report 2017*. <https://6fefcbb86e61af1b2fc4c70d8ead6ced550b4d987d7c03fcdd1d.ssl.cf3.rackcdn.com/cms/reports/documents/000/002/327/original/Carbon-Majors-Report-2017.pdf?1501833772>

Hare, B. and N. Hohne. 2021. "Cop26 is creating false hope for a 1.5C rise – the stark reality is very different." *The Guardian*, November 9. <https://www.theguardian.com/commentisfree/2021/nov/09/cop26-false-hope-climate-analysis-targets>

Heyd, T. 2020. "Covid-19 and climate change in the times of the Anthropocene." *The Anthropocene Review* 8 (1): 21-36.

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

Karafyllis, N. 2020. "Biofacts, Bioprospecting, Biobanking: A Reality Check of Seed Banks." In *TechnoScienceSociety*, edited by Sabine Maasen, Sascha Dickel and Christoph Schneider, 131-156. New York: Springer.

King, S. and G. Weedon. 2020. "Embodiment is Ecological: The Metabolic Lives of Whey Protein Powder." *Body and Society* 26 (1): 82-106.

Latour, B. 2004. "Why Has Critique Run out of Steam? From Matters of Fact to Matters of Concern." *Critical Inquiry* 30: 225-248.

Latour, B. 2018. *Down to Earth: Politics in the New Climatic Regime*. Cambridge: Polity.

McDonald, M. and J. Sterling. 2020. "Feminist new materialisms and the troubling waters of the 2016 Rio de Janeiro Olympic and Paralympic Games." In *Sport, Physical Culture, and the Moving Body: Materialisms, Technologies, Ecologies*, edited by Joshua I. Newman, Holly Thorpe and David Andrews, 283-300. New York: Rutgers University Press.

McLoud, C., P. Haozhou and J. Newman. 2018. "Blue Skies Over Beijing: Olympics, Environments, and the People's Republic of China." *Sociology of Sport Journal* 35: 29-38.

Meyer, J. 2020. "The Politics of the 'Post-Political': Contesting the Diagnosis." *Democratization* 27 (3): 408-425.

Monbiot, G. 2017. *Out of the Wreckage: A New Politics For an Age of Crisis*. London: Verso.

Morton, T. 2016. *Dark Ecology: For a Logic of Future Coexistence*. New York: Columbia University Press.

Orr, M. and N. Jarvis. 2018. "Blinded by Gold: Toronto Sports Community Ignores Negative Legacies of 2015 Pan Am Games." *Event Management* 22: 367-378.

Orr, M. 2020. "On the potential impacts of climate change on baseball and cross-country skiing." *Managing Sport and Leisure* 25 (4): 307-320

Orr, M. 2021. "Finding consensus on indicators for organizational climate capacity in sport." *Managing Sport and Leisure*. Doi: <https://doi.org/10.1080/23750472.2021.1914710>

Powis, B. and P. Velija. 2021. "Cricket has no Boundaries with NatWest? The Hyperreality of Inclusion and Diversity in English Cricket." *Sport in Society: Cultures, Commerce, Media, Politics* 24 (8): 1510-1525.

Pugh, R. 2020. "Trail Jargon of the Month: 'Braiding'." *NSMBA*, August 11. <https://nsmba.ca/trail-jargon-of-the-month-braiding/>

Purdy, J. 2015. *After Nature: A Politics for the Anthropocene*. Cambridge, Mass.: Harvard University Press.

Ross, W.J. and M. Orr. 2021. "Predicting climate impacts to the Olympic Games and FIFA Men's World Cups from 2022 to 2032." *Sport in Society: Cultures, Commerce, Media, Politics*. Doi: <https://doi.org/10.1080/17430437.2021.1984426>

Ross, D. 2018. "Introduction." In *The Neganthropocene*, edited by Bernard Stiegler, 7-34. London: Open Humanities Press.

Servigne, P., R. Stevens and G. Chapelle. 2021. *Another End of the World is Possible*. Cambridge: Polity.

Stiegler, B. 2009. *Technics and Time, Volume 2: Disorientation*. Redwood City: Stanford University Press.

Stiegler, B. 2011. *Technics and Time, Volume 3: Cinematic Time and the Question of Malaise*. Redwood City: Stanford University Press.

Stiegler, B. 2018. *The Neganthropocene*. London: Open Humanities Press.

Stiegler, B. and A. Dunker. 2021. *Rediscovering Earth: Ten Dialogues on the Future of Nature*. New York: OR Books.

The Intergovernmental Panel on Climate Change. 2021. *AR6 Climate Change 2021: The Physical Science Basis*. <https://www.ipcc.ch/report/ar6/wg1/>

The World Counts. 2021. *Global Challenges*. <https://www.theworldcounts.com/challenges>

Thorpe, H. 2015. "Natural disaster arrhythmia and action sports: The case of the Christchurch earthquake." *International Review for the Sociology of Sport* 50 (3): 301-325.

Thorpe, H., J. Brice and M. Clark. 2020. *Feminist New Materialisms, Sport and Fitness: A Lively Entanglement*. London: Palgrave.

Tsing, A.L. 2015. *The Mushroom at the End of the World: On the Possibility of Life in Capitalist Ruins*. Princeton: Princeton University Press.

Tsing, A.L., H. Swanson, E. Gan and N. Bubandt. 2017. *Arts of Living on a Damaged Planet: Ghosts and Monsters of the Anthropocene*. Minneapolis: University of Minnesota Press.

Turner, M. 2014. "Modern English Football Fandom and Hyperreal, 'Safe', 'All-seater' Stadia: Examining the Contemporary Football Stage." *Soccer and Society* 18 (1): 121-131.

Verlie, B. 2021. *Learning to Live with Climate Change*. London: Routledge.

