

THRIVING ON A PALE BLUE DOT: CRIMINOLOGY AND THE ANTHROPOCENE

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Introduction

We, *Homo Sapiens*, have had a varied history, during our brief time on this planet of ours. So many of the things we have done, and continue to do, to each other and other fellow earthlings have been unspeakably horrible as well as heartrendingly caring – we have been a Janus-faced lot (Harari, 2014). Through all of this we have not only survived but have thrived on ‘our’ tiny ‘pale blue dot’ – the term that was used to describe the iconic image captured by the space craft, Voyager 1, as it turned its cameras, at astronomer Carl Sagan’s request, one last time to Earth as it moved beyond our solar system, appropriately, on Valentine’s day 1990.

We have done well in creating wellbeing for ourselves as earthlings.

Our thriving has been particularly evident during a temperate climatic period on the planet that geologists have dubbed the ‘Holocene’ – meaning, wholly new. This short period of some 12,000 years since the last Ice Age, has seen us reach into every corner of our planet as we created safe spaces for ourselves in which we live, work and play. Enabling this accomplishment has been a planetary infrastructure of ‘ecological services’ (Constanza, 1997) that have sustained us as biophysical beings. Rockström (2009) has conceived these services as constituting a ‘safe operating space for humanity’ that has been made possible by a set of ‘planetary boundaries’ (Steffan et al., 2015) that defined the environments of the Holocene.

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For us humans, these planetary boundaries have been the foundation of our biophysical survival as a species, along with many other species. Many of us have conceived of these boundaries as Nature, a realm that we took advantage of, and took for granted. A world that we thought of as a warehouse of unlimited resources available for our use (Verbeek, 2005) and that we thought we did not, and indeed could not, influence. Nature was the work of Gaia and Gods, not our work. Certainly, many indigenous peoples had conceptions and rules that recognised our interconnectedness with the natural world (Adamson and Davis, 2017; Williams, 2013: 261), but what many in the Global North barely glimpsed, and did not fully understand or acknowledge, was that Nature constituted our biophysical security. Without Nature there would be no ‘us’.

While we lived in, and took advantage of, Nature, for us our realm of accomplishment was ‘the social’ (Rose, 1996). This was a domain of existence that Durkheim (1950) conceived as an independent realm, that we constituted, that was entirely apart from biophysical Nature – two *sui generis* realities. While we humans constituted ‘the social’, we had little, if any, influence over Nature -- or so we thought. It was within this ‘way of seeing’ (Smith, 1987), that the ‘social sciences’, including criminology, emerged. The natural sciences studied Nature, while we social scientists studied the results of the human work that constituted the social worlds within which we had our being as ‘social animals’. Within this conception humans, as earthlings, had been influential in shaping the social world but with respect to the world of Nature we have been, in Harari’s (2014) words, decidedly ‘insignificant animals’.

This framing has quite suddenly been overturned via, what Pat O’Malley (this volume) has termed, a ‘collapse of nature into society’– a collapse that was admittedly a long time in coming. Greek tragedy author, Sophocles, long ago reflected how ‘man’ easily ‘wearies even the noblest of gods, the Earth’ (quoted in Heidegger, 1959: 86). And as others have documented more fully (Williams, 2013; White, Rudy and Gareau, 2016), the history of the social has repeatedly been nudged by questions of animal equality (Bentham, 1907), restrained economic growth (Mill, 1909) and our humbling existence as but one part of an evolving planet (Darwin, 1859). These ideas were reinforced by the rise of 20th century environmental perspectives advanced by scientists and social scientist (e.g., Leopold, 1949; Carson, 1962; Lovelock and Epton, 1975; Singer, 1975; Merchant, 1980). These many modern environmental thinkers increasingly positioned Nature as relevant to society, as well as questioned the Cartesian dualism between them (see Lidskog and Waterton (2016)

discussing environmental sociology; see Williams (2013) discussing wild law). Leopold (1949: 205) nicely illustrates this in his arguments for a new 'land ethic' noting: 'man is, in fact, only a member of a biotic team'.

Notwithstanding this long and formidable body of thought, humans quickly became rapacious consumers of 'ancient stored sunlight' (Hartmann, 2013) as a source of energy to enhance our wellbeing. With the advent of the Industrial Revolution an acceleration commenced, driven by a contingent coupling of a fossil fuel (initially coal), the steam engine, and manufacturing of goods through machines (Marks, 2006). What we did not realise initially, but now know, is that through our harnessing of fossil fuels, and the release of carbon into the atmosphere that this involved, we humans became, virtually overnight, very significant animals indeed. So significant that we have become influential 'geological actors' (Chakrabarty, 2009) who are, not only part of Nature, but have fundamentally shaped planetary systems. This is exemplified by anthropogenic climate change and a veritable array of declining indicators of biodiversity and ecosystem health (UNEP, 2012; Clark, 2014). The 'unintended consequence' (Merton, 1936) of our actions has been to fundamentally undermine 'planetary boundaries', the 'safe planetary space' and the 'ecological services' upon which our wellbeing had depended in huge and consequential ways – as our changing climate now makes clear.

In doing so, we have placed our survival, and that of other earthlings, in jeopardy (Lovelock, 2006; 2015). This, in Klein's (2014) telling words, 'changes everything'. For criminology, and security studies more generally, this means that we now need to rethink our most foundational assumptions – our Durkheimian heritage. We can no longer treat our 'safe planetary space' as independent of us. We can no longer treat the harms that we have previously attributed to Nature – 'natural' disasters – as natural. These harms, and the planetary boundaries that we have relied upon for our safety, must now be 'problematised' (Foucault, 1980) in radically new ways. What earth scientists have recognized (Crutzen and Stoermer, 2000; Crutzen, 2002) and what social science must now recognise, is that Nature is in large part a human 'accomplishment' (Garfinkel, 1967). This recognition has given rise to the claim that the Earth has now entered a new geological age, a human age, 'the Anthropocene' (Steffen, Crutzen and McNeill, 2007).

The Anthropocene signifies a new role for humankind: from a species that had to adapt to changes in its natural environment, to one that has become a driving force in the planetary system (Crutzen and Stoermer, 2000; Steffen et al., 2011; Biermann, 2014: 57). Although it is far from a settled concept (Ruddiman Crucifix and Oldfield, 2011; Hamilton et al., 2015; Lidskog and Waterton, 2016) the naming of the Anthropocene increasingly serves to indicate a re-contextualisation of human history as ‘a mere moment in Earth’s deep time’, while insisting that we acknowledge the profound consequences of the scale and speed of the global change that human actions have wrought (Beck, 2014: 404-405).

Responses to the proclamation of this new human age have varied significantly (see Dalby, 2016; Corlett, 2015: 38). Some view the Anthropocene and its consequences in a ‘negative’ light (Hamilton, 2015), others see ‘bright spots’ (Ellis, 2011; Bennett et al., 2016), while still others have come to focus their attention on a new awareness, succinctly captured by Steffen et al., (2011: 756) who state: ‘“business-as-usual” cannot continue’. It is this latter view that provides the girders for this book, and it suggest that our collective approach to criminology research and practice must change (Corlett, 2015: 38).

An increasing body of work has come to examine, explore and critique the concepts, consequences and solutions within the Anthropocene. However, according to Lövbrand et al., (2015: 212) much of this work has been underpinned by ‘marginal and instrumental roles granted to the social sciences and humanities...producing a post-political Anthropocene narrative dominated by the natural sciences and focused on environmental rather than social change’ (see also Lidskog and Waterton, 2016). This has led to increasing assertions like those made by Viñuales (2016: 5) that the Anthropocene ‘calls upon all disciplines, the entire body of human knowledge about the world, to analyse what is happening and how to face it’. This is a call that some in the social sciences are beginning to answer (Lövbrand et al., 2015: 212; Lidskog and Waterton, 2016). Scholars have focused on institutional responses (Biermann, 2014; Dryzek, 2015), legal questions (Biber, 2016; Galez, 2014; Kotze, 2016; Vidas et al., 2015), concepts of agency (Latour, 2014), critiques of the human-centred *Anthropos* (Gear, 2015) and the entangled relations between natural and social worlds (Lövbrand et al., 2015: 21; Harrington and Shearing, 2017; Lidskog and Waterton, 2016), who argue nature and culture are constantly being ‘done’. Nonetheless, few in criminology have yet to turn their attention to these issues (c.f., South, 2015; Shearing, 2015; Floyd, 2015).

We put the question of the implications for criminology of the Anthropocene to leading thinkers within criminology. This edited volume presents their answers. In this chapter, we aim to outline some of the fundamental questions posed by the Anthropocene for criminology, and briefly summarise how these issues were tackled by our authors. This discussion provides a framework for our subsequent examination and reflection on the book's chapters and what they suggest are the core implications for criminology of the Anthropocene.

The challenge of the Anthropocene

Our starting point for this book was that the Anthropocene may require a fundamental rethinking of safety and security. Indeed, the safety and security that earth systems have provided can no longer simply be regarded as the work of Nature, and as something that we humans must simply live with. We are now revealed as a geological force that has, and is shaping these systems. And this, to return to Klein, changes everything. And it most certainly may change, and has already begun to change, criminology, an area of enquiry whose fundamental topic has been safety and security (Shearing, 2015).

The appreciation that we humans are influential biophysical agents invites us, as criminologists, to ask what criminology could be, and should be, in the Anthropocene. As we develop new criminological imaginations (White, 2003) we have no choice but to start from where we are now, and pull ourselves up by our bootstraps (Shearing, 2015: 258). As we do this pulling, we need, as Larner (2011: 320) has noted, to be wary of 'totalizing and epochal thinking' and to seek instead 'nuanced' and diverse responses that acknowledge the complexity, dynamism and uncertainties inherent in the Anthropocene (Shearing, 2015: 258). And as we do so, we will no doubt recognise continuities, as well as disruptions, before we will be able to innovate in ways that will carry us beyond our present (Shearing, 2015:258).

To push the limits of existing criminological knowledge this book asks:

- What has already been achieved in criminology and what remains unanswered for confronting the key intractable problems of the Anthropocene?
- What might criminology be in the Anthropocene?

- What does the Anthropocene suggest for future theory and practice of criminology more generally?

The chapters in this book seek to contribute to this research agenda by examining, contrasting and interrogating different vantage points, aspects and thinking within criminology.

In Chapter 2, Brisman and South set the scene for exploring criminology's contribution to the analysis and debate that flows from the Anthropocene. Acknowledging that criminology has only very recently begun to consider these matters in any substantial way, their contribution to this debate begins with an overview of some of the issues raised by the idea of the 'Anthropocene', before considering dominant conceptualisations of the environment as 'resource' and 'private property.' Underscoring the anthropocentric acceleration of the theft of lands and oceans, their chapter turns to a discussion of how resource scarcity and climate change will continue to be criminogenic, what this means for the idea of 'environmental security' and the risk that the Anthropocene will accentuate, rather than do away with the human-nature dualism.

Following Brisman and South's chapter, the issue of a criminogenic Anthropocene and criminology's response to it is taken up by two chapters, which centre around notions of criminal responsibility for ecocide. In Chapter 3, White raises and discusses the international crime of 'ecocide' to target contributors to climate change. Critiquing capitalism's response to global warming, White contends that current political and social measures are not adequately addressing climate change. Finding that both nation-states and corporations must be held to responsible for global warming, he argues that contemporary policies and practices can be considered criminal, and its perpetrators therefore as 'carbon criminals'.

Chapter 4 continues the interrogation of criminal responsibility, with Haines and Parker analysing attempts to criminalise environmental damage, specifically in the context of climate change. Drawing on a unique combination of green criminology, regulatory studies and a case study analysis, they examine the normative and legal project of criminalisation of business conduct that breaches ecological limits ('ecocide'). They conclude that, whilst there is considerable benefit in both normative and legal attempts to criminalise, it is also necessary to understand the complexity and fundamental economic logic of current regulatory regimes.

Chapter 5 (O'Malley) offers something of a re-joinder to the preceding calls for more, and more informed, regulatory and criminal responsibilities in the Anthropocene. Centred around Bentham's rejection of traditional criminal sanctions of imprisonment, O'Malley explores innovative approaches to environmental crime in the Anthropocene. Raising the question of what regime of sanctions should be embraced in this age characterised by chronic issues of natural resource depletion, he concludes that financial sanctions (through fines or insurance schemes) are the most effective method for ensuring environmental justice for 'green' crimes. Rather than imprisonment, what is needed for O'Malley is a justice system that focuses instead on harm minimisation through money transfers - whether in the form of compensatory damages or of monetary fines.

The next two chapters shift the focus from crimes and sanctions to concepts of security and safety. In chapter 6, Marks and colleagues explore private security and the creation of walls as defensive structures, focusing particularly on the transition period in South Africa. Examining the actual impact of the walls that have been created in South African suburban spaces and their failure to live up to their intentions, Marks et al. argue for the breaking down of walls – physical and metaphysical – in the age of the Anthropocene. They illustrate this argument through a unique 'experiment' currently underway in Durban aimed at enhancing connectivity, security, and inclusivity (human and other) of all agents in the earth system.

Chapter 7 (Crawford) continues the focus on security, but takes a more global view of future insecurities and conflicts arising from drought, desertification and migration. Diagnosing the Anthropocene as demanding a re-evaluation of how we think about historical time across various disciplines and fields of analysis, Crawford explores the meanings of, and interconnections between, 'security' and concepts of 'sustainability', the 'everyday', and the 'emergent' in the study of crime, risks and harms. He argues that each is informed by different temporal registers that imply differing ethical considerations and explores their intersectionality, sites of contestation and interwoven assemblage that raise issues for critical security studies in an anthropogenic age.

In Chapter 8, Chan concludes the volume by reflecting on the lessons criminology can learn from the politics of the Anthropocene. Examining what Chan diagnoses as an anthropogenic climate change paradox, she reviews the literature on personal experience and psychological distance as explanations for public apathy. This is followed by a discussion of the sociology

of ‘moral panic’ and the notion of ‘social drama’. Her conclusion is that criminology can learn much from the politics of the Anthropocene, including the contestation of scientific authority, the political nature of knowledge, the contingencies of psychological distance and the role of non-human ‘actants’ (Latour, 2013).

In the remainder of this introductory chapter, we attempt to synthesise key generalisable lessons and insights from these leading thinkers and respond to the questions we have posed above. As we will see, the diversity of issues, contexts and responses examined in each chapter meant there were few conclusive answers to the questions raised. However, there were cross-cutting themes, each providing distinctive understandings and propositions for the implications for criminology in the Anthropocene.

First, we consider what has already been achieved in criminology and what remains unanswered for confronting the key intractable problems of the Anthropocene. Second, we examine what criminology may be in the Anthropocene. Finally, despite the chapters having outlined many recommendations for practice and theory of criminology, we ask what remains to be explored and researched in the future of criminology practice and theory.

What has already been achieved in criminology and what remains unanswered for confronting the key intractable problems of the Anthropocene?

The chapters identified a mix of key intractable problems of the Anthropocene, including climate change and overexploitation of natural resources that cause environmental insecurities, crime and corruption (see e.g., Brisman and South (ch. 2), White (ch.3), Haines and Parker (ch.4) and Crawford (ch. 7)), related human insecurity and fortified spaces (see e.g., private spaces in Marks et al. (ch. 6) and migration and borders in Crawford (ch. 7)) and the rise of new risks and social harms (O’Malley (ch. 5)). Many of our chapters also point to society’s lack of decisive action to address the challenges posed by the Anthropocene (see e.g. Chan (ch. 8)). Haines and Parker (ch. 3), for example, point to social and moral outrage, or in Chan’s words, the ‘panic’, at global system level changes. And as White implies, much of this outrage arises because systems such as capitalist consumption have been a major cause of this change, yet we rarely can hold *systems* responsible. Of course, such a claim is of little surprise, as Hardin (1968) long ago made clear that commons challenges like global

climate change or biodiversity loss are far from a small governance challenge. For Hardin, a key response was coercive enforcement, and as we will see below, it is here where criminology perhaps is most comfortable and can offer important insights on responding to the Anthropocene's challenges.

Indeed, our reflections on the multitude of insecurities, crimes and jurisdictional contexts raised across the chapters revealed at least two common themes – responsibility and criminalisation; and 'securitisation' (Floyd, 2014; Schuilenburg, 2015) – in offering answers to the question we pose above. Neither of these themes appeared in all chapters and nor did authors give them equal attention, but each was a focus across a range of issues and contexts, implying that they mark core achievements and questions for criminology when confronting the problems of the Anthropocene.

Responsibility and criminalisation

The achievements of criminology in understanding and responding to social and environmental harms arising from the Anthropocene were many and varied. They included contributions from green criminology (White (ch. 3) and Haines and Parker (ch. 4)), security studies (Marks et al. (ch. 6), Crawford (ch. 7)) and traditional criminology (O'Malley (ch. 5); Chan (ch. 8)). While such bright lines between these areas of criminology are used largely for heuristic purposes (with many chapters embracing mixes of these areas, e.g., Brisman and South (ch. 2); Chan (ch.8); O'Malley (ch. 5)), perhaps the theme with the most applicable understandings for the Anthropocene was the green perspective of criminology, most evident in White (ch. 3), Haines and Parker (ch. 4) and Brisman and South (ch. 2).

Green criminology emerged decades ago to highlight the need to reconcile the natural and social worlds and expand 'criminological imagination' (Natali, 2013: 78). Ruggiero and South (2013: 359) describe green criminology as a 'framework of intellectual, empirical and political orientations toward primary and secondary harms, offences and crimes that impact in a damaging way on the natural environment, diverse species (human and non-human) and the planet'. A burgeoning field (see e.g., Brisman, 2014; Spapens, White and Huisman, 2016; Lynch and Stretesky, 2014; Gibbs et al., 2010; Bisschop, 2015), its research covers environmental harms (often used as a broader descriptor than strictly legal notions of 'crime'), environmental laws (applied through criminal and civil governance systems) and

environmental regulation (broader law and social control systems and processes in place to govern environmental impacts) (Ruggiero and South, 2013: 359).

Within this green perspective, criminology scholars have often cast an analytical and critical gaze on the quintessential problem of the Anthropocene - climate change - and the political economic structures of advanced capitalism (White and Kramer, 2015: 384-385; Lynch et al., 2013). Various research agendas think about, unpack, diagnose and respond to numerous challenges of rising sea levels, people displacement, resource scarcity and related environmental insecurities that cause crime and inequality and challenge law enforcement and border security (Agnew, 2012; South, 2014: 6). It is of little surprise then that a core group of our chapters reveal there is much that can be learnt from this brand of criminology when responding to the challenges of Anthropocene.

As the chapters of White and Haines, and Parker exemplify, one important contribution of criminology (albeit of this greener shade) is its ability to direct attention to agents of anthropogenic change, their responsibilities and how blame should accordingly be apportioned. Responsibility is ‘familiar stuff’ to criminology, but it is a major challenge arising from the Anthropocene, where we may all, in fact, be responsible for a multiplicity of harmful actions over centuries (Biber, 2016; Vinuales, 2016). Indeed, such unprecedented levels of responsibility pose a serious ongoing challenge for governments and scholars when thinking about how to express duties and accountabilities for past, present and future environmental and social impacts of global environmental change (Biber, 2016; Vinuales, 2016: 59-60). Both Haines and Parker’s and White’s respective calls for an Anthropocene defining a crime of ecocide accordingly offers an illustration of how existing green criminological thought can help in this task.

Both chapters examine the agitation and potential of a crime of ecocide as a response to climate inaction. In so doing, they begin to flesh out what Floyd (2015: 281) suggests will be needed from criminology in the Anthropocene, namely:

...thinking systematically about what crime means when – in the absence of a new binding carbon emissions regime, but in the full knowledge of the root causes of climate change – states, businesses and so on intentionally neglect to curb carbon emissions.

Moreover, both chapters appear to confirm Floyd's (2015: 281) hunch that 'the Anthropocene gives renewed relevance to crime and criminalization'. As Haines and Parker explain in this volume, criminology offers help in analysing 'the role that criminalisation can play in the shift required for contemporary societies to face multiple pressing environmental challenges and live sustainably within ecological planetary boundaries'.

There are also chapters that argue that such a focus on criminalisation and its symbolic impact will fail to eliminate unwanted actions in the Anthropocene. As O'Malley succinctly puts it 'the urge to punish... will not take us far'. Nevertheless, for White criminalisation can be effective in shining a light on the 'criminality of the powerful', namely states and corporations, and their omissions and failures. As he argues, such a step is vital for apportioning responsibility in the Anthropocene, particularly given the challenge of assigning prior and ongoing knowledge of harms, ability to pay, and the beneficiaries of past damaging activities. In short, a major contribution of green criminological understandings is that they can highlight how criminalisation can be used 'as both a normative strategy, centred on its social and symbolic properties, and also as an authoritative legal strategy, expressed most strongly through the call for the creation of a crime' (Haines and Parker, ch. 4).

This is not to suggest that green criminology should be prepared to rest on its laurels. As the chapters themselves reveal, strategies and analytical framings of 'crime' may not produce the results needed in the age of the Anthropocene. Haines and Parker (ch. 4), for example, point to the ongoing failures of establishing legislated crimes of ecocide in practice. They accordingly draw our attention to a need to 'rethink the assumption of many regulatory practices and theories that the environment is an externality to be addressed by fixing market failures'. Brisman and South (ch. 2) extend this suggestion, noting that in the criminogenic future of the Anthropocene, research and practice will need to be 'sensitive' to the collective cognitive dissonance of dependency and dominion over nature if it is to 'contribute to academic and public discourse about this dismaying future'.

In part because of the above concerns, O'Malley (ch. 5) queries criminology's focus on criminalisation and its symbolic impact, adding that 'while it may satisfy moral outrage it does nothing to repair harms'. Rather, O'Malley suggests that in the age of the Anthropocene, criminology needs to pay more attention to new models of sanctions for environmental crime,

particularly financial sanctions, which he argues ‘are the most effective method for ensuring environmental justice for ‘green’ crimes’.

Governance of Security and the Environment

While there are many useful lessons from green criminology for confronting the key intractable problems of the Anthropocene, there were other sets of insights gleaned from the governance of security scholarship. Moving beyond a focus on law and crimes, the governance of security scholarship increasingly looks to broader forms of control, such as the presence of public and private ‘auspices’ and ‘providers’ (Bayley and Shearing, 2001) and the role of non-human ‘actants’ (Latour, 2013; Shearing and Stenning, 1985; Holley and Shearing, 2017: 164).

Building on and/or echoing this conceptual and analytical work, Marks et al, Brisman and South, and Crawford’s chapters demonstrate how this more polycentric provision of the public good of safety can begin to blur into and include the provision of other public goods, like the environment. Although mindful of the ‘promiscuity of security as a governing frame of reference’ (Crawford, ch. 7), Shearing (2015) has argued elsewhere that security, in the age of the Anthropocene, goes beyond an exclusive focus on human-to-human engagements to include thing-to-human and human-to-thing engagements. All three chapters appear to echo this, implicitly or explicitly, when they recognise insecurities arising from a non-sustainable use of resources, climate change and other environmental challenges (Brisman and South, ch. 2; Marks et al. ch. 6; Crawford, ch. 7). And although they pick different issues to interrogate (be it resource use, walls or temporality), they share common thoughts on the way that security scholarship can help us be ‘mindful’ (Marks et al., ch. 6) of the practices, mentalities and responses to insecurities raised by the Anthropocene, and its potential to construct and reinforce its very challenges. For example, Brisman and South (ch. 2) point to a drawbridge mentality in the national security space, which not only separates us from each other but ‘from engagement with the earth except in terms of exploitation’. Similarly, Marks et al. argue individualistic trends in security (walls which rupture ‘the natural and human built environment’) not only challenge the democratic nature of public space but can ‘lead to the alienation of humans from one another and their environment’ (Marks et al., ch. 6).

Despite these contributions from the governance of security scholarship, the chapters identify a range of under-examined issues that will require further attention. Marks et al. (ch. 6), for instance, identify a need for a more reflexive understanding of security, that not only questions the current technologies and mentalities (see Johnston and Shearing, 2003), but pursue new experiments underpinned by our symbiotic relationship with constructed and natural landscapes (glimpses of which may echo their ‘Alliance without Walls’ example from Durban). Crawford (ch. 7) also identifies a need to better account for the temporality of security that will require us, in his words, to ‘think differently about the ethics of security, moral responsibility and justice’. Perhaps not surprisingly, the issue of temporality is one which also resonated with the above focus on responsibility and criminalisation. White (ch. 3), for instance, raises issues of temporality in the context of criminal responsibility, focusing on how we apportion blame through considering ‘prior and ongoing knowledge of the harm and the beneficiaries of past damaging activities.’

What might criminology be in the Anthropocene?

There was little agreement that the Anthropocene *fundamentally* changed criminology, nor was there consensus on the precise forms of change. However, there was broad insistence that the Anthropocene should and could be tackled by criminology, and the book’s chapters unpack and interrogate different aspects of this challenge. Some of the visions of criminology in the Anthropocene overlap with the achievements and future challenges noted above, particularly issues of criminalisation. However, as we highlight below there were also collective insights that further ‘push at boundaries’ (South, 2014: 15) of criminology.

Environmental crime, environmental harms and a greener criminology

Criminology, it seems, will be defined by environmental crimes and environmental harms in the age of the Anthropocene. As Brisman and South (ch. 2) note: ‘In the future world of the Anthropocene, both resource scarcity and climate change will be criminogenic with implications for legislation, law enforcement and the way nations regard their borders’. Building on the familiar human-to-human hitting and taking harms that characterized Hobbes’ ‘war-of-all-against-all’ (Hobbes, 1951), criminology in the Anthropocene is likely to include more human-to-thing harms, and thing-to-human harms, such as: pollution, harms to the natural habitats of other species, and harms to other species. Many of the harms that will

be ‘governed through crime’ (Simon, 2007) will have significant spill overs between local, national and global jurisdictions (Biber, 2016: 44). For example, traditionally, local activities such as agriculture or development of urban properties will increasingly be considered to have global implications, not least because of their significant contributions to global greenhouse gas emission (Biber, 2016: 46).

This ‘trans-jurisdictionality’ (Gray, Holley and Rayfuse, 2016) of environmental harms will challenge both existing and newly developed laws and enforcement apparatus, particularly at the global level (Spapens, White and Huisman, 2016). It will likely require proactive and intelligence-led policing (to respond to lack of immediate victims or visibility of many harms) and new levels of co-operation (between local, national and international agencies and between agencies and third party enforcers, like NGOs) (Spapens, White and Huisman, 2016: 2; Holley and Shearing, 2017). Perhaps most significantly, it is going to require a more global-oriented criminology that is willing to study, define and advocate for many specific harms to the environment that are not yet defined as criminal offences (Spapens, White and Huisman, 2016: 2). White (ch. 3) spells out such an orientation when he argues persuasively for criminological conceptualisations of climate change as a form of ecocide:

...the challenge is to criminalise those individuals, corporations, industries, and governments that, even in the light of overwhelming scientific evidence, through acts or omissions, continue to contribute to the problem....This is wrong and needs to be described for what it is – a crime against humanity and, fundamentally, nothing less than intentional and systematic ecocide.

This is a vision of a Hobbesian inspired ‘Gaiathan’, which criminology can and should continue to examine, explore and strengthen in the Anthropocene. It will require a knowledge of crime and criminal behaviour, and it will examine and advocate for ‘law and legal change, environmental law enforcement activities, courts and adjudication processes, and direct social action’ (White, ch. 3).

Certainly, such a criminology will need to rise to the new harm landscape. Chan (ch. 8) offers some reflections on this in her arguments for establishing ‘an assemblage of solid knowledge about crime and justice, one that is less focused narrowly on crime reduction but takes a more global perspective on harm reduction’. Such a focus could, as Chan suggests, be on

criminological subjects of harsh polices/imprisonment rates, however it can equally be applied to broad harm landscapes confronting criminology in the Anthropocene, namely harms on and from earth systems (e.g., floods, fires).

Even if criminology in the Anthropocene were to remain crime-ology (see Shearing, 1989; also Hillyard and Tombs, 2007), it may need to be watchful of increasing ‘fear-based narratives’ of the Anthropocene, which can readily militate surveillance, hierarchical control and greater government intrusion into private lives (see eg., Biber, 2016; Cook and Balayannis, 2015; Lidskog and Waterton, 2016: 403). Chan wisely cautions of such risks criminology may face as discipline and actor in the Anthropocene. Drawing lessons from the politics of the Anthropocene to identify the fronts on which criminology will need to battle, she suggests criminology may risks losing its position as an authoritative source of knowledge over crime. It will need to ensure that the growing politicisation of criminology does not undermine vital social acceptance of its ethos to attach responsibility for harm, and thereby protect the interests of the underdog, the disadvantaged and the powerless affected by the environmental insecurities in the Anthropocene.

A continuing of crime-ology in the age of the Anthropocene will also need a continuing mindfulness that even if crimes are introduced at the international (or indeed other) level, it is likely that only a small percentage will end in conviction (Spapens, White and Huisman, 2016: p 2; Haines and Parker, ch. 4). Seeking alternative approaches (e.g., education and information), and continuing critical attention to economic structures that produce environmental harms and subsequent conflicts and insecurities will accordingly be important (Spapens, White and Huisman, 2016: 2-3; White ch. 3). Furthermore, as Haines and Parker (ch. 4) note, it will also be a criminology that recognises and seeks to account for and improve laws and regulatory regimes that currently remain ‘silent on the critical need to recognise ecological limits’.

Criminology, connectedness and agency

A second set of visions for criminology in the Anthropocene coalesced around the importance of connectedness (between humans and humans, and humans and things) and experimentation in governing environmental crimes, harms and security. As Latour (2014:

15) has pointed out, such a recognition of connectedness and the distribution of agency is essential, because in the Anthropocene ‘all agents share the same shape-changing destiny’.

Marks et al.’s (ch. 6) analysis of walls in South Africa demonstrates what can happen when life and security is individualised and fortified (rather than connected). Brisman and South (ch. 2) warn of a similar risk in nation states and the ‘drawbridge mentality’ that can arise from environmental insecurities and crisis. To confront these challenges, Marks et al. call for the breaking down of walls in a bid to imagine a connected and entangled public life. Echoing Latour, they argue for a new and creative understanding of the complex interconnections between security, technology, humans, and the environment – a connected criminology. As they put it:

...the Anthropocenic predicament being a reality that affects all life forms on Earth and beyond...must be addressed through an integrated approach...righting the Anthropocenic trajectory relies upon the construction of bridges, connections, relationships, and feedback loops, rather than their destruction.

Other chapters also reaffirm the need for building greater integration and connection into criminology. Haines and Parker’s (ch. 4) concept of ecological regulation recognises that humans, business, governments, animals, trees, oceans are all connected and embedded within a closed loop of local and planetary ecosystems and responsive to social and economic tensions and crises.

Crawford’s analysis (ch.7) of temporality in security also lays out a case for more a connected and holistic - rather than hyper individualistic – approach to criminology. For Crawford, criminology in the Anthropocene will need different thinking, one which understands the interconnections between the past, present and future across our social activity, and recognises the multiple temporalities that interact in complex and interwoven ways. Such an understanding, he argues, will have implications for our understanding of ‘causation, moral responsibility and justice, as well as how we think about security practices, their genesis, patterns of development, adaptations and implications’. There are echoes here of South’s (2014: 12) earlier typology of a green criminology (representing dimensions of space and time reflecting ‘environmental health and victimization’; ‘the socio-economics of everyday ecocide’; ‘global connections’; and ‘intergenerational and future challenges’.

In arguing for such connectedness, Haines and Parker (ch. 4) and Marks et al. (ch. 6) also suggest a need for more polycentric and experimental approaches to criminology practice and research. This stems from the recognition that changes will never be swift, and innovation will necessarily be, in Haines and Parker's words, 'plural in nature and require plural normative and legal strategies'. Marks et al. echo these concerns, noting

...a trajectory of experimentation, failure, iteration and learning can shape the evolution of the epoch ... a growing awareness of the interrelationship between humanity and the earth could signal a bending of the Anthropocenic arc toward outcomes that are more positive and possible.

O'Malley (ch. 5) usefully envisions one such path for experimentation, arguing for a criminology that begins to embed a concern for *homo economicus* to design out and prevent crime, rather than punish it.

Notwithstanding the novelty of these ideas, Brisman and South (ch. 2) usefully warn that such new approaches and concepts may fail to develop momentum or reach their potential as ideas for change because they can easily become revised to simply support and perpetuate the status quo. It is perhaps for these reasons that White (ch. 3) suggests that we need a return to more radical criminology theory in the Anthropocene. For White, the future of criminology will require 'assertion of democratic control over land, air, water and energy'; 'divesting the present "owners" of their private property and re-asserting communal control', particularly in the case of 'transnational corporations [that] contribute a significant proportion of the world's carbon emissions'.

What does the 'Anthropocene' suggest for the theory and future practice of criminology more generally?

Throughout the book's chapters, numerous questions are raised about the theory and practice of criminology in the age of the Anthropocene that are important to future research and rethinking of criminology. We take a step back to identify two sets of questions that arise across the chapters.

A question of criminology or security

One major question for future research that has been raised by the contributions in this volume is whether criminology can or should be abandoned in favour of environmentally-conscious security studies (O'Malley, ch. 5)?

As a range of scholars have argued, the nature of criminology and its presumptions have arguably already been shifted by security (Ngoc Cao and Wyatt, 2016; Zedner, 2009). Green criminology has been said to already include some canons of security studies, evidenced in examinations of the security implications of wildlife trafficking, the impacts of environmental degradation on security of human beings, as well as broader security issues arising from environmental insecurity (see review by Ngoc Cao and Wyatt, 2016: 415). However, security and particularly environmental security is not a well-defined or easily understood term. As South (2015: 271) has noted, 'although the concept of "security" (public, private or hybrid) is by no means new in criminology and has been explored in various ways...the idea of "environmental security" has hardly been discussed at all in the criminological literature'. And where it has been discussed, it has often been subject to critique. White (2014: 835) for instance, critiques a version of environmental security as linked to the fortress mentality (an idea discussed further by Brisman and South, ch. 2). Floyd (2015: 276) has argued that it is "analytically weak" to describe all political practices concerned with achieving greater justice and/or security as a state of being as security practices'. Further, she notes that '[e]levating environmental issues to security problems does not necessarily produce a more secure environment for people'. At the same time, Ngoc Cao and Wyatt (2016: 425) counter that the integration of security and green criminology is 'theoretically logical, pragmatically achievable and productive'.

This is a debate that is far from being resolved and future research and thinking will be needed in this space. The contributions in this volume begin to flesh out some of the contours of these debates (albeit that such arguments were not always front and centre in the chapters). Chan (ch. 8) for instance provokes such debate with a query of whether the Anthropocene means we should 'forget about criminology altogether'. Crime is dwarfed by confronting large, geological-scale changes that challenge human society – or in Shearing's (2015) terms threaten our 'environmental security'. However, along with others such as Brisman and

South, White, and Crawford, Chan sees crimes as a likely consequence of the dire consequences of global warming that will include massive flooding, migration at unprecedented levels, hence a struggle for food and resources, leading to disorders, criminality, conflicts and wars. On this view, criminology is not made irrelevant by security.

O'Malley (ch. 5), in contrast, is perhaps the most direct in thinking through a shift away from a criminogenic focus to new harms that he notes may more closely align with an analytic of security in preference to that of criminalisation. His is a vision of security of 'harm minimisation – whether by harm prevention or through mitigating or compensating for harmful actions', and with this vision in mind, introducing 'a regime of compensation: something surely attractive in this harm-oriented age'.

Although acknowledging the risk and problems of pecuniary reorientation he proposes (e.g., encouraging commodification), at his strongest O'Malley suggests that perhaps 'criminalisation and criminology should be allowed to slide into irrelevance rather than strengthened "as if" they offer solutions in an age of social harms. At the same time, "security" – such as is preferred by Shearing and others – appears in a different light than might normally be recognised'.

These arguments and insights raise a range of important questions that will require attention in future research and practice of criminology. For example, to what extent can criminogenic concepts express the level of responsibility of humans as a geological actor that fundamentally shape planetary systems? Or is there a need for a deeper rethink of fundamental notions, such as safety and security, to address the challenges of the Anthropocene (Viñuales, 2016: 59)? And what are the advantages of a governance of security over a crime-ology focus? Can the governance of security offer an analytical purchase that better recognises spaces beyond traditional criminogenic tools like law and governments (for example, what mixes and interactions between public, private and non-government actors will be needed to respond to the complex, dynamic and uncertain challenges of Anthropocene? (Holley, Gunningham and Shearing, 2012)) and/or better unpack the organisation roots of many of the Anthropocene's causes and problems (for example, what is the role of sovereignty and national boundaries (walls), without which climate mitigation would not present a collective action problem? (Viñuales, 2016: 2, 59-60)).

The interaction of criminology and other disciplines

A second area for research that has been raised in this book, but remains underexplored, is the extent to which criminology's ideas and disciplinary orientation are capable of rising to the challenge of the Anthropocene. At least some of this book's contributions seem to suggest criminology will need to look outside of its discipline. As O'Malley puts it, there is need to look beyond our own 'ologies' and find others. Haines and Parker (ch. 4) similarly look to regulation as a compliment to green criminology, while Brisman and South (ch. 2) and Chan (ch. 8) suggests the importance of considering existing criminological concepts alongside their compatibility with insights from psychoanalysis and social psychology. These insights raise critical issues for further research, namely how and in what ways is criminology able to join in interdisciplinary labours to find solutions to and better understand the Anthropocene and its challenges? Indeed, if a trajectory of experimentation, iteration and learning is to form a vital part of the response to the Anthropocene epoch (Marks et al., ch. 6), criminology may come to explore issues such as responsibility for harms and justice (perhaps for both human and non-human species) in wider programmes of research, focused on preventing biodiversity loss or understanding the challenges that arise from interactions and contests between water, energy and food security. These and other connections will be particularly important given the sheer scale and multifaceted nature of the Anthropocene, and the challenges it poses not just for criminology, but for all disciplines and all earthlings on this tiny, tiny pale blue dot.

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