CAMERON HARRINGTON,
CLIFFORD SHEARING

SECURITY IN THE
ANTHROPOCENE

REFLECTIONS ON
SAFETY AND CARE

[transcript] Political Science
The belief that »Nature« exists as a blank, stable stage upon which humans act out tragic performances of international relations is no longer tenable. In a world defined by human action, we must reorient our understanding of ourselves, of our environment, and our security. This book considers how decentred and reflexive approaches to security are required to cope with the Anthropocene – the Human Age. Drawing from various disciplines, this bold reinterpretation explores the possibilities for understanding and preparing a future that will look vastly different than the past. The book asks to dig deeper into what it means to be human and secure in an age of ecological exception.

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This was not an easy book to write, as readers will probably guess. Its subject matter is rarely uplifting, and is often dispiriting. Given our backgrounds in the disciplines of international relations and criminology we are often required to think through seemingly tragic, locked-in security dilemmas; ones that seldom deal with the brighter sides of humanity. The Anthropocene is the most daunting security challenge either of us have encountered. We have done our best to make sense of our current predicament without giving in to cynicism or despair, though some days this seemed impossible to do. There are no answers to be found within the following pages. Our hope is that our contribution will provoke debate, discussion, and further consideration of the multifaceted security challenges we face.

The genesis of this book came in 2014. Cameron Harrington was working on a postdoctoral project on water security at the University of Cape Town under the supervision of Clifford Shearing. Over discussion we realized that, independent of the other, we had both been thinking deeply about Anthropocene questions. It was decided soon thereafter to begin forming our different thoughts into a cohesive manuscript. The journey has taken over two years and over that time we have become indebted to many.

Our ideas have been shaped and reformed through numerous discussions, presentations, workshops, and seminars in the exceptional surrounds of Cape Town. We are grateful for the lively, interdisciplinary community at the University of Cape Town, particularly our colleagues based in the Global Risk Governance programme (GRG), the Faculty of Law, Institute for Humanities in Africa (HUMA), and the Centre of Criminology (now the Institute for Safety Governance and Criminology). Thanks to Elaine Atkins and Francisca Zimmerman in particular for
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At various points, and in different locales, we have shared portions of this book, learning a great deal along the way. We have presented parts of the book at the University of Cape Town, the London School of Economics, the University of Montreal, and the University of Ottawa. Thank you to the participants, discussants, and chairs at various conferences, including the 2015 and 2016 International Studies Association Conferences in New Orleans, and Atlanta, and the 2015 Millennium Journal Annual Conference in London, UK. We have benefited from numerous discussions with inspiring scholars. In particular thanks to Ken Booth, John Braithwaite, Anthony Burke, Barry Buzan, Simon Dalby, Scott Hamilton, Jonna Nyman, and Mark Salter for reading and commenting on draft chapters, related articles or presentations. Further thanks to the anonymous peer reviewers who commented upon and critiqued various aspects of this manuscript. We are also indebted to Ricky Röntsch for her excellent editing assistance.

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Matt Harker (eds), *Posthumanism*. E-International Relations Publishing. Readers familiar with these articles will find overlap throughout this book.

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*Cameron Harrington  
Clifford Shearing  
*Toronto and Cape Town, January 2017.*
Chapter One: Security in the Anthropocene

“No, no, you are not thinking; you are just being logical.”
(Niels Bohr quoted in Frisch 1979:95)

What does it mean to live and die in a world that is ending? What happens to our ideas and practices of security when much of what we have taken for granted—including the requirements for our safety and our very survival—now ceases to be?

Security references a state of protection—where threats are absent, insignificant, or managed. It is the condition of feeling safe. A state of being without care, of being carefree, because all is well (Hamilton 2013: 32). Yet, if we are to take seriously all of the warning signs that tell us that humanity is careening headfirst into a new world that offers no platform of stability, no guarantees of safety or survival, what then? These are the questions that face us as we move through, the 21st century. They are the questions we consider in this book.

For almost all of our entire existence we humans have been “insignificant animals with no more impact on [our] environment than gorillas, fireflies or jellyfish” (Harari 2014: 11). This insignificance produced profound effects on our security ideas. This insignificance has granted us the “safe operating spaces” (Rockström 2009) we have enjoyed for millennia. It has allowed us to be carefree and careless about the earth and the safety it has provided.

We are no longer insignificant. This, in Naomi Klein’s words, “changes everything”. We have become, through labor and technique, powerful ‘geological agents’ (Chakrabarty 2009) who are actively shaping the Earth system in ways that seriously undermine our safe spaces. There has been, in Pat O’Malley’s phrase, a “collapse of nature into society” (O’Malley forthcoming). This has happened before and with dire consequences but never on this scale. In 2015, for the first time in human history atmospheric
carbon dioxide (CO$_2$) levels reached 400 parts per million (PPM) on average across the whole year. This is a remarkable increase when compared to the atmospheric carbon dioxide levels that existed prior to the Industrial Revolution, which stood at around 278 PPM. This can be traced largely to human activities: a growing population; intensified agricultural practices; increase in land use and deforestation; industrialization and energy use from fossil sources. The increase in CO$_2$ (along with other greenhouse gases like methane and nitrous oxide) is of course the main driver behind global warming. By the end of 2015 the warming influence of greenhouse gases had increased by 37 per cent since 1990 (Dahlman 2016). While estimates vary, the prevailing wisdom is that feedback from the Earth system will increase the rate of climate change in the near and long-term future. As future climate change impacts drought, it will weaken the land carbon sink and amplify atmospheric CO$_2$ growth. By century's end the world will probably be warmer by 2-4 degrees Celsius in spite of the global pledge at the 2015 Conference of the Parties to the United Nations Framework Conventions on Climate Change (UNFCCC)—commonly referred to as COP 21—in Paris to limit global warming to 1.5 degrees Celsius (hereafter °C) (UNFCCC 2015). The election of Donald Trump, an avowed climate change-denier, in November 2016 as President of the US, with an economy that produces roughly 16 per cent of the world's global greenhouse gas emissions (Boden et al 2015), signals to us that 1.5 degrees seems to be an increasingly unlikely outcome, while 4 degrees, and its devastating consequences for planetary life, has become more likely.

Trying to construct a political response for a cumulative series of events over the course of a century, let alone a millennium, seems impossible. The difficulty is magnified by the uncertainty, unpredictability, and the inequality of climate change. As the world slowly and inadequately prepares for a world that will be 2°C warmer by the end of the century, we are simultaneously tasked with preparing for a world that could very likely be 4°C warmer, which would equal the same temperature change that occurred between the ice age and the Holocene. If we hit 4°C, a number of interrelated catastrophes are expected: the tropics will become uninhabitable; the melting of the Greenland and Antarctic ice sheets will be guaranteed, together with a subsequent rising of the oceans by upwards of 70 meters (National Snow and Ice Data Center 2015; World Meteorological Organization 2016: 24); there is likely to be a vast diminishment of crop yields, threatening food production and human health; there will ensue
a massive loss of biodiversity; an increase in the spread of vector-borne
diseases; and overall water scarcity. Even if governments of the world are
successful at limiting warming to between 2-3°C, the long-term impacts
will be severe. Over the next two millennia, 20 per cent of the world’s
population will be forced to move from coasts, which will be swallowed
up by the sea. Cities including New York, Calcutta, Shanghai, and Rio de
Janeiro are likely to be under water (Clark et al. 2016). Responding to these
scenarios seems beyond the realm of our security thinking. Our future
will demand the impossible.¹

It has been claimed that we are now witnessing the onset of a mass
extinction event, the first in 56 million years (Kolbert 2014). While
there have been previous mass extinctions—science fiction stories
notwithstanding—we have not, until now, always considered this as a
possibility for us.² The end of the world. Not through divine intervention,
or nuclear annihilation (which still haunts us), but through the slow,
insidious actions of our everyday. We are finding it hard to acknowledge this
change in our circumstances and to change our ways. This predicament
invites criminology and international relations, two disciplines that focus
their attention on security, to consider what security might mean, and how
it might be practiced, within our new realities. Finding a way of doing this
will not be easy for either discipline. Both areas of enquiry have developed
within the shadow of Emile Durkheim’s radical separation of nature and
society as two sui generis domains, where a collapse of one into the other
has been by definition impossible. And yet this is what has happened.

¹ See the special theme issue, edited by New et al. of Philosophical Transactions
of the Royal Society (2011), entitled “Four Degrees and Beyond: Potential for a
Global Temperature Increase of Four Degrees and its Implications.”

² For many, international relations as a discipline came of age during the Cold
War, when the world existed under the threat of nuclear war and total annihilation.
The apocalyptic visions of nuclear attacks and the prospects of a resulting
‘nuclear winter’ is the closest we have come in our disciplines to dealing with
the material and emotional components of global extinction. The Anthropocene
offers a similarly catastrophic threat landscape as a nuclear winter, but its vision
of extinction—slow, latent, barely discerned, and yet violently effective—exists in
stark contrast to the spectacular immediacy of nuclear war and deterrence logics.
The Anthropocene extinction isn’t solved with a telephone hotline. See Colebrook
(2014: 40).
How this challenge is conceived, and met, within these disciplines will define their contributions to our emerging age and its unique insecurities. For most classical security theorists—from Thucydides to Hobbes, Clausesewitz to Morgenthau—human social worlds have been, at root, an anarchic realm that has guaranteed a constant level of insecurity that could only be temporarily assuaged. How this ‘social’ insecurity has been, and may be moderated, has been at the center of the concerns of criminology and international relations. Within both disciplines, humans have been conceived as, in John Gray’s (2002) phase, “rapacious primates” who constantly endanger each other in a Hobbesian “war of all against all”. Dangers lurk around every corner. Security, a constantly shifting phantom, can be realized only to the extent that humans can reign in their innate, violent, tendencies stoked by self-interest. This story of (in)security has been posited, critiqued, and repeated *ad nauseam* for centuries. It has formed the basis for the thinking about intrastate societal security (criminology) and interstate national security (international relations). It has been used to understand sovereign power and authority as source of security. Fear of the barbarism inherent in the state of nature has been thought of as strong enough that, “whatever the sovereign does cannot be as bad as the condition of unrestrained competition” (Walker 1997: 67). By large measure, our contemporary theories and practices of security adhere to these established assumptions.

But as is becoming clearer, strange and fantastic things are happening; a consequence of our failure to shift our sensibilities and practices as we have moved from being insignificant to significant animals. Rising oceans, record temperatures, ocean gyres of plastic garbage, climate-altering oil spills and methane leaks—the Earth and its inhabitants are defying expectations. The remarkable transformation of the Earth system into a wholly new geologic epoch is unthinkable and nonsensical for contemporary approaches to security—approaches that have viewed our planet as a stable system that operates independently of humans. Our unquestioned confidence in the security provided by nature, regardless of what we did, has been and is being shattered. We have discovered the unthinkable: how we act matters not just for us but for Earth itself. We are, to our surprise, deeply and irrevocably entangled. And there is no going back because the world of our ancestors has vanished. What once was can never again be. The scale and speed of shifts in the Earth system is unprecedented, unpredictable, uncertain and profoundly dangerous for
human life, for our fellow earthlings, and for our institutions. We have no choice but to alter our pursuit of a secure coexistence. Gaia, to use James Lovelock’s term for our living Earth, has spoken forcefully and eloquently.

Security, both as a practice and as an analytical category, is more complex than we ever imagined. As a consequence we are compelled to revisit our core ideas and reorient our practices as we make sense of the planet’s inter-permeable systems of humans, animals, things, and processes. The idea of an ‘Earth system’—the planet’s interlocked, interacting physical, chemical, and biological processes—has been absent from almost all security approaches. Our purely anthropocentric framings are no longer viable—they were a luxury that cannot be maintained. If our metamorphosis teaches us anything, it is that we are entangled in a complex set of assemblages—one set of interlinked things among many. The name that has been proposed for our new geological age that we are entering is the Anthropocene, the Age of Humans—an age of humans as consequential, interlinked things that impact not only themselves but the systems of which they, like all other things, are a part.

By most metrics, individual security and well-being have risen rapidly as we have accessed, and used, fossil fuels. Over the past 25 years, two billion people have been lifted out of low development levels (UN Development Programme 2015). Extending back even further, life expectancy has risen dramatically over the last few centuries, with rapid improvements occurring in developing countries in recent decades. Today, the countries with the lowest life expectancy (Swaziland, Lesotho, Central African Republic) are better off today than any country in the year 1820 (van Zanden et al. 2014). Many human risks have been drastically reduced. Sidestepping for the moment persistent violence and rising inequality, the Anthropocene has arrived at a time when humans have never had it so good. A comforting calm before the coming storm.

There is no question that for all earthlings the Anthropocene is an age of new and monumental risks that threatens to rapidly undo the security gains of the past several centuries. The impacts of human behavior extend into deep time and have buried themselves in Earth’s crust. Exactly what this means, and will mean, may never be fully known. What is known is that the continued rise in greenhouse gas emissions, together with a host of other, often related, environmental effects, promise a future (across short-, medium-, and long-term) that is unlike anything earthlings have
ever experienced. This will be a future where humans are metaphysically and literally at the center of the world.

The term Anthropocene offers a clear vision of the source of these developments—*anthropos*. That we have indeed entered the Age of the Anthropocene is revealed when unravelling this claim. The human has radically seeped into every corner. Every discipline—from philosophy to atmospheric chemistry, from visual arts to stratigraphy—is affected. And yet surprisingly, the concept has yet to take hold in the two disciplines that have foregrounded security studies.

It is true that a small subset of international relations scholars and a growing number of ‘green’ criminologists are producing insightful work on the Anthropocene and its security implications. But these have contributed largely as a tentative beginning. The Anthropocene is still overwhelmingly absent from security studies. This is all the more curious given the fact that according to the most comprehensive global survey of international relations scholars—the 2014 Teaching, Research, and International Policy (TRIP) survey—the most important foreign policy issue the world will face over the next ten years is global climate change (TRIP 2015). The same poll however revealed that only about two per cent of the nearly 4000 scholars surveyed listed the international/global environment as their main area of research (Teaching Research and International Policy 2014). Both disciplines, with the exceptions of small islands of new thinking, remain virtually unchanged. The signals are clear; security is still deeply rooted in Holocene-bred understandings of security. The reasons for this are varied and complex and will be examined throughout this book. For established security studies, wedded as they have been to anthropocentrism and visions of geography as political territory, the Anthropocene is ontologically and epistemologically weird. Exploring how security is related to animals, nitrogen, microbes, deep time, and niche constructions of environmental impacts that include all ‘earthlings’—as the Anthropocene demands—is an altogether foreign task. A task that requires the disciplinary divides to transcend the established social-nature divide. It will also undoubtedly require the enrolling of a variety of

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3 | A small sampling would include international relations scholars such as Simon Dalby, Frank Biermann, and Audra Mitchell, and criminologists such as Avril Brisman, Michael Lynch, Nigel South and Rob White.

4 | The lack of traction in the niche field of ‘green criminology’ illustrates this.
emerging technologies that can detect, measure, simulate and model on scales that are too vast and complex to be transposed and communicated via the cognition of humans alone (Weart 2010; Weart 2003). We cannot study climate change, forecast future global pandemics and so on without nonhuman technologies/intelligences, including computer-based modelling on supercomputers (Chun 2011; Thomas 2014).

The hybrid nature of the Anthropocene requires the pluralization of security and of security studies. Our survival and well-being are bound together with others—across species, time, and objects. This entanglement, so fundamental to the Anthropocene, is a mystery to security studies. A principal goal of this book is to shed some light on this mystery.

**BRINGING DEEP TIME INTO SECURITY**

The term Anthropocene conveys something profound, though it has taken a while to realize it. Introduced in 2000 as a seemingly benign neologism by the atmospheric scientist Paul Crutzen (a Nobel Laureate) and geologist Eugene Stoermer (Crutzen/Stoermer 2000: 17-18), the term, and the ideas it embodies, have grown into a worldwide phenomenon. It expresses the idea that humans are now fundamentally altering the planet, including its long-term geological processes, at an increasing rate. While it has not been accepted by the official bureaucratic body—the International Commission on Stratigraphy—the Anthropocene is now widely accepted as a suitable moniker for a modern age beset by climate change. The idea that humans can and do change the earth is not new. While Stoermer first used the term in the 1980s, the intellectual history of the idea it seeks to capture stretches far back in time. Yet, while the concept is outwardly intuitive, it

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5 The recognition that humans have the power to control the Earth system had been acknowledged as early as 1873 by the Italian geologist Antonio Stoppani who spoke of the “anthropozoic era”, describing it as, “a new telluric force which in power and universality may be compared to the greater forces of earth” (Stoppani quoted in Crutzen 2002: 23). A few decades later, in 1926, V.I. Vernadsky and Teilhard de Chardin used the term “noösphere,” the “world of thought” to describe how human brain-power shapes the environment and its future (Crutzen 2002: 23).
holds vast implications. Humans have forever altered the planet; they are historical geo-forces.

Declaring the advent of a new geological age is not simply a matter of measuring the hard facts of geological changes. While these geological changes are likely to be found in measurements of extinction impacts or nuclear fallout, we must also recognize that the Anthropocene requires a massive cognitive shift to incorporate relationality and entanglement. If humans are geologic agents the traditional divide between people and an external world of things, which Durkheim’s sociological thinking epitomizes, dissolves. We are found everywhere, with everything. Our traces are found in forests, glaciers, skies, oceans and everywhere in between. We have altered, and are altering, the seasons and the DNA of life-giving matter. We have ended worlds (e.g., through extinctions) and have begun new ones, e.g., populations of jellyfish ‘bloom’ thanks to high levels of agricultural waste being dumped into the ocean, which leads to the widespread growth of algae and zooplankton (Purcell et al. 2007).

Figuring out how to think and act along geological temporal scales is a new task for security studies. Cultivating an ethos that holds us as relational beings in which there is no nature, no ‘out there’, is a crucial task for making sense of security in the Anthropocene.

How then, is the Anthropocene any different from what has come before? It is self-evident that it differs in terms of the absolute and relative impacts of humans upon the Earth. As a species, we are wholly dominant, able to shape Earth to meet almost our every need. Understanding how we got here requires us to shift our temporal and spatial scales, bringing deep time, and things big and small (from the cosmological to the quantum) into relation with our emerging security predicaments. We now turn to a brief examination of security through previous geological ages, focusing on the entanglement of nature and society.

THE PLEISTOCENE

The Pleistocene (from about 2.5 million years ago to 11,700 years ago), when we find Earth’s last major ice age, is characterized by the repeated glaciations that overtook the planet over the span of millions of years. It was during the Pleistocene when hominids first emerged and evolved enough to organize themselves in small, tribal societies, displaying a
unique level of intelligence lacking in other primate species. As these emerging humans developed they also spread themselves across most parts of the world, particularly during the milder interglacial periods, which left new, open landscapes available for settlement. Archaeological evidence in deep time is scarce and patchy, but the available data suggests that a gradual migration and colonization of ecosystems, by prehistoric hunter-gatherers had occurred in almost all parts of the world, including the Americas and Australia by the late Pleistocene.

Thinking about the Pleistocene means more than reiterating the story of painfully slow and methodical evolution of humans and their technology towards greater and greater sophistication. This story, repeated by many traditional archaeological studies, views human evolution primarily as a function of environmental pressures; human evolution emerges as “a story of chimpanzees entering an environmentally driven conveyor belt at one end and emerging at the other as Homo sapiens.” (Coward et al. 2015: xxvii). Recent developments, beginning in the 1980s, have seen Palaeolithic archaeology reorient its traditional study of early humans away from a closed scientific positivism in order to better incorporate complex entanglement through a focus on human relationships with other beings and things. This ‘post-processual’ turn in archaeology, ‘a return to things’, exemplified in the works of Ian Hodder (2012), Michael Shanks and Christopher Tilley (1992), and Clive Gamble (2007), counters cleaner teleological views of human prehistory that has long been the accepted and unquestioned narrative.

These authors foreground the social and cognitive aspects of early human life instead of focusing on how environmental pressures cue corresponding changes in human physiology and behavior. They create an archaeology-of-movement, which studies evolutionary changes as a dynamic process of interaction between people as particular kinds of things with other things. The so-called ‘creative explosion’ is used to denote the separation of humans from other hominids. This ‘event’ began somewhere between 100,000-70,000 years ago in parts of Africa, when humans first demonstrated symbolic thought—understood as the ability to identify and craft representations of things. Anthropologists differ in their explanations for the creative explosion: they typically label it as a result of genetic mutation, the culmination of gradual processes of development, or something that rose and fell with climatic disruptions (Wilson 2012). No matter the explanations, modern human behavior
is correlated with the technical and cognitive ability to express emotive thought via the use of objects—for example, the tools used to etch paintings and patterns onto cave walls and stone fragments. This turn in archaeology shows how humans have always been fully entangled and related with other organisms, technologies, and metaphors. This links all of human history to a broader history of the universe and its physical and chemical processes (Godson 2014). It also means ‘peopling’ the deep past, emphasizing the microscales at which interpersonal and embodied social practice helps materialize personhood (Dobres 2005: 265). This practice explains change on an archaeological timescale by emphasizing the hybridity of prehistorical culture. It means looking at the messy mixtures of materiality and symbolism that goes into making sense of human action. These analyses, harbingers of what the Anthropocene requires, seek to link all of human social history to a broader, deeper history of the universe and its physical and chemical processes (Godson 2014). They guide us to engage the messy mixtures of materiality and symbolism of human life (Dobres 2005: 265). Neolithic houses, masks, and kinship networks are used as examples of social technologies that point to the relatedness between people and material culture. Entanglements are revealed as processes that both enable and entrap (Hodder 2014).

For these scholars the earliest houses of the Pleistocene period are not simply dwellings developed by primitive humans to protect against the natural elements (though this is, of course, one use); they are also ‘bodies’—Latour’s ‘actants’. According to Clive Gamble, the entanglement of humans, other beings, materials, culture, and symbolism complicates our stories of prehistoric security. For him,

> houses are the ultimate container of people, livestock, tools and memories. Houses are carved, wall-papered, added-to and repaired. They are quintessential biographical objects, growing, changing and eventually dying. They are culturally relative. One person’s Golden Hall is another’s thatched barn. And almost coincidentally, they keep out the wind and rain. (Gamble 2007: 98)

Even the most basic form of personal security—constructing necessary shelter to protect one’s life—becomes a relational endeavor, infused with symbolism, technology, materials, social status, and culture. Our security structures are hybrid entities, composed of multiple, interacting and cross-cutting networks of living beings and things. Gamble further explains:
In other words, people, manufactured objects and things such as trees are not distinct categories based on biology or the possession of life. Rocks, trees and animals are all examples of material culture and as such can be part of relational networks, as well as relating to each other independently of people. For example, a hen-house is built by people. But the hens that live in it have a relation to those surroundings which conditions their actions when the chicken farmer is far away. Orwell’s political satire Animal Farm depends, once Farmer Jones is expelled, upon the developing relationship between the pigs and the farmhouse and the other animals and their barn: a good example of how, with hybrid culture, the rational distinctions governing relationships quickly break down. What emerges in turn is a network of relationships between people, things and objects or, more simply, networks of material culture. (Gamble 2007: 96) (Internal references omitted)

Even in our deepest history, human security has been correlated to the security of other beings, things, places, and processes. These ideas, and others like them, prefigure the sorts of analyses that the Anthropocene requires: analyses in which humans are recognized as things, affecting and being affected by other things in a single realm that dissolves the natural-social dyad—a dyad that lies at the heart of the carelessness that has been so instrumental in giving rise to the Anthropocene.

**The Holocene**

The Holocene, Greek for “wholly new,” was not formally pronounced until 1967 by the US Geological Survey. It reflects a period of both glacial advance and retreat, with an overall sea-level rise of just a bit more than 35 meters (Wanner et al. 2008). It is also an age with variable warming and cooling trends (depending on the timescale and the hemisphere of measurement), due to orbital changes, solar radiation and volcanic eruptions (Summerhayes/Charman 2015; Wanner et al. 2015). The Holocene has been characterized by relative climate stability. It was during this period that the continents dried out and our contemporary landscape was formed. Changes in geological terms during the Holocene have been negligible. For example, over the entirety of the Holocene (12,000 years) the continents have shifted less than a kilometer. As Jedediah Purdy (2015) puts it, “a reasonably fit person could cover the scale of planetary change in a brisk eight-minute walk.”
Almost all of our ideas about human history and the development of civilization have occurred in the Holocene. Of course it does matter that the global human population at the start of the Holocene was around two million (Goldewijk et al. 2010). By most estimates, overall population numbers remained at this level until the beginning of the agricultural revolution, some 5000 years ago. The emergence of complex human societies during the Holocene was made possible by its relative climate stability. This provided for large areas of human habitation and the creation of increasingly agricultural systems and higher population densities. While the Pleistocene was characterized by hunter-gatherer societies with low population density, the Holocene saw the onset and the rapid development of agricultural and cooking technologies. This in turn led to the emergence of a series of civilizations, including those present on the planet today. According to Richerson and Boyd:

Intensified subsistence and higher population densities multiply the number of people and volume of commodities that societies can mobilize for economic and political purposes. Expanded exchange allows societies to exploit an expanded division of labor. Larger armies are possible to deal with external threats or to coerce neighbors. Expanding the number of people sharing a common language and customs will accelerate the spread of useful ideas. Given appropriate institutions, the denser societies made possible by agriculture can realize considerable returns to better exploitation of the potential of cooperation, coordination, and the division of labor. (Richerson/Boyd 2001: 213)

The fundamental form of security, for humans as for all species, is biophysical well-being, which depends on the ability to extract what is needed for survival from the resources of the planet. Take for instance the role of fire—crucial to the emergence of cooking—which enabled less energy to be spent on digestion and more on brain development (Harari 2014). As humans flourished in the period of climatic stability, a population bomb exploded, though the nearly-exponential growth of global populations did not start until very recently. In fact, the global human population has quadrupled over the last 100 years, soaring to over 7 billion, with global GDP growing twenty-fold during this time (European Environment Agency 2015). Current estimates conclude that by the end of the 21st century the Earth will be home to more than 11 billion people (United Nations Department of Economic and Social Affairs, Population...
Chapter One: Security in the Anthropocene

As our numbers have grown, so have our need to extract more and more resources to feed ourselves. A spiral of ‘take, make and waste’ ensued, enabled by climatic stability that supported bio-physical systems and provided humans with safe operating spaces. The irony of the Anthropocene is that, as advances in technology enabled ever greater ‘taking’ and ‘wasting’ to support our ‘making’, the bio-physical systems upon which this all depended have been undermined—a killing of the goose that lays the golden egg on a planetary scale.

The crucial piece in this story has been a succession of energy revolutions that began with the mastering of fire (Pyne 2001; Clark/Yusoff 2014). This burning expanded enormously with the discovery of fossil fuels, these being effectively energy batteries that had been charged by the sun over millennia (Hartmann 1999). As we learned how to burn to extract more and make more, our ‘taking, making and wasting’ expanded through industrialization (Rifkin 2011). A crucial feature of these processes was the generation of electricity—an enormously flexible form of energy that can be produced from a variety of energy sources—on a massive scale, as we burnt coal to “end the night,” drive machines and, most importantly, create a new space—cyber and digital. It is the waste of industrialization, which has brought with it much well-being for humans that more than anything has shaped the shift from the relatively benign conditions of the Holocene to the conditions that are emerging with the Anthropocene. Herein lies the profound irony that Ulrich Beck (1992) identified with his risk society. It is the very activities that have allowed for our flourishing during the Holocene that might lead to a sixth mass extinction on Earth.

The Holocene may be over but its artefacts—its social systems, its mindsets and its 7 billion humans—still remain embedded in the Earth in the early 21st century. The mind-set that prevails over Holocene Earth resources, along with its institutions, has been built upon a view of the ‘natural’ world as separate from the domain of humans. These resources are viewed abstractly, with no power to interact with humans and vice versa. This has meant that the security of Earth systems, environmental security or, the security that nature provides, was never of concern, and indeed has scarcely been recognized. We humans have long regarded the planet as a sterile stage upon which we act, but do not impact in any

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6 | See, for example, Rifkin (2014) and Crosby (2006).
way. This illusion, which pervades almost all corners of western thought, has had profound consequences for our ideas about security, which are fundamentally anthropocentric and absent of ecological thought. The Holocene mind-set—that nature is self-evidently ‘out there’ and is a dutiful provider to human societies—lingers, despite physical evidence suggesting the world has moved on. The Holocene world is “the only state of the Earth system that we know for sure can support contemporary society” (Steffen et al. 2011a: 739). Trying to break free of the Holocene world—physically, ontologically, and institutionally—is a fundamentally risky proposition, but we may not have a choice. Thus we are forced to take the defining Holocene artefacts and use them as the bootstraps we humans will have to draw upon as we endeavor to remake ourselves for a new age.

**The Anthropocene**

In contrast to the earlier geologic periods of the Pleistocene and Holocene, the Anthropocene, as we have seen, inverts the view of humans as passive bystanders who take advantage of, respond to, but do not shape Earth systems. The cumulative actions of humans, this relatively young species, have fundamentally transformed the Earth (Steffen et al. 2007; 2011a; 2011b). From climate change to nuclear fallout to biodiversity loss to ocean acidification, the marks of the human on the Earth are indelible and permanent. They will remain long after the last of us turns out the lights (Dodds 2008).

The Anthropocene coincides with an increasing awareness of systems thinking and the burgeoning literature on Earth System Science (Steffen et al. 2004). A broad consensus now exists that—taken together—human activities have injected new biophysical factors into the biosphere, modifying the physical parameters that determine the functioning of major Earth systems (Dalby 2014). The world known to us through climatic history is over. We have left the interglacial state of the Holocene and are

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7 | Even John Stuart Mill, who presciently warned against the environmental costs of the unlimited, progressive growth of the economy, still felt that the role of nature was to satisfy human desires for security and happiness; see especially Book IV, Chapter VI of Mill (1885).
pushing the Earth into *terra incognita*. While climate change attracts the majority of attention, other environmental transformations are underway simultaneously that also threaten the “safe operating space for humanity” (Rockström et al. 2009; Steffen et al. 2015a). The Earth is rapidly becoming less biologically diverse, less forested, much warmer, wetter, and stormier (Steffen et al. 2007). As Steffen et al. (2015b: 12) observe:

The atmospheric concentrations of the three greenhouse gases—carbon dioxide, nitrous oxide and methane—are now well above the maximum observed at any time during the Holocene [...]. There is no evidence of a significant decrease in stratospheric ozone anytime earlier in the Holocene. Nor is there any evidence that human impact on the marine biosphere, as measured by global tonnage of marine fish capture, has been anywhere near the late 20th-century level at any time earlier in the Holocene. The nitrogen cycle has been massively altered over the past century [...]. Ocean carbonate chemistry is likely changing faster than at any other time in the last 300 million years and biodiversity loss may be approaching mass extinction rates.

Despite these remarkable developments, the term Anthropocene has generated significant debate on whether there is enough geological evidence to fully warrant declaring a shift from Holocene to Anthropocene (Autin/Holbrook 2012: 60-61; Fahrenkam-Uppenbrink 2015: 87-88). The International Commission on Stratigraphy, established an Anthropocene Working Group (AWG) that looked for ‘golden spikes’ in the geological record that could lead to an official declaration of the Anthropocene as a distinct geological epoch. In mid-2016 the AWG concluded that stratigraphic ‘signatures’ that were either entirely novel or outside of the normal variable ranges for the Holocene period had been identified. These signatures convincingly bore the mark of human action and it seemed as though they were accelerating. They wrote:

The driving human forces responsible for many of the anthropogenic signatures are a product of the three linked force multipliers: accelerated technological development, rapid growth of the human population, and increased consumption

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8 Part of the debate revolves around whether it is possible to find the ‘golden spike’—the physical evidence buried in rocks and sediment that demonstrate a major change in the earth system—required for the naming of a new geologic age.
Security in the Anthropocene

of resources. These have combined to result in increased use of metals and minerals, fossil fuels, and agricultural fertilizers and increased transformation of land and nearshore marine ecosystems for human use. The net effect has been a loss of natural biomes to agriculture, cities, roads, and other human constructs and the replacement of wild animals and plants by domesticated species to meet growing demands for food. This increase in consumption of natural resources is closely linked to the growth of the human population. (Waters et al. 2016: 1)

Unsurprisingly the process and debate over declaring the Anthropocene has grown highly politicized. There is a technical difficulty in accurately finding geological markers and stratigraphers do not take amendments to the Geological Time Scale lightly. It took over 50 years for the Geological Congress to settle on the Holocene (Chakrabarty 2009: 210). Besides that, the search for the Anthropocene reflects deeply political questions about who is responsible for its emergence and what type of human impact should be considered the most profound. Many thoughtful commentaries have argued that the term Anthropocene, by implicating ‘humanity’ as a singular force of nature, masks deep divisions and inequalities of sex, race, geography, and class. The Anthropocene was not created equally; it was made by a specific subset of humans, namely those on the frontlines of modernization: white, wealthy, males of European heritage. For these reasons, a variety of new labels have been proposed as a way to more accurately reflect the specific characteristics of the human age, including “the Capitalocene” (Moore 2015; Haraway 2015), the “Eurocene” (Grove 2015), the “Technocene” (Hornborg 2015), the “Anthrobscene” (Parikka 2015), the “Oliganthropocene” (Gemenne 2015), the “Manthropocene” (Raworth 2015). Each of these terms carries different implicit diagnoses and thus compels different sets of responses (Baskin 2015).

Beyond the question of who is responsible, the social and geological critiques of the Anthropocene have become enmeshed in the significant debate on when it started. Most studies emphasize one of three markers for the starting date: 1) the earliest detectable human impacts; 2) the earliest widespread impacts; and 3) historic events such as the Industrial Revolution or the mid-20th century’s ‘Great Acceleration’.\footnote{The Great Acceleration’ is the neologism (intentionally echoing Karl Polanyi’s ‘Great Transformation’) coined by Will Steffen and others (2015b), which emerged out of their efforts to build a more systematic picture of the human-driven}
2015, the climate scientists Simon Lewis and Mark Maslin published an article in *Nature* that rejected those proposals on the basis that they are not derived from a globally synchronous marker. Cumulatively the markers certainly affect the Earth system, but none of those options represent a singular marker in the global geological record (on an annual/decadal scale) (Lewis/Maslin 2015). Indeed, the first two options equate the existence of humans with the Anthropocene—humanity has remade the Earth simply by being human. This drains the term of its political potential. It belies the fact that Crutzen created the term as a way to highlight the damaging choices that humans have made to get us to this point.

Lewis and Maslin settle on two main contenders for the Anthropocene starting date. Both reflect global political processes. The first option is found in the impacts from the Great Acceleration, which refers in geological terms to the unprecedented and major expansions in human populations, together with the creation of new, long-lasting materials from minerals to plastics to persistent organic pollutants and inorganic compounds (Lewis/Maslin 2015: 176). One of the principle event horizon markers for the ‘Great Acceleration’ is the global fallout from nuclear bomb tests. These tests began in 1945 and steadily increased through atmospheric testing in the 1950s and early 1960s, until the partial test ban treaty came into effect in 1963. Since then, nuclear tests have fallen precipitously. Based on measurements of radionuclide fallout captured by tree rings and glacier ice, 1964 has been identified as being the peak year of radioactivity and thus has been proposed as the year the Anthropocene began. Even though radiocarbon has a relatively short (in geological terms) half-life of 5730 years, the mark of humans upon the sediment changes to the Earth system. As they mapped the imprints of human enterprise they realized that from about 1950 onwards, human effects upon the earth have reached a speed and volume unprecedented in the history of humankind. The Great Acceleration encompasses near-synchronous stratigraphic markers including not just radionuclides, but aluminum metal, fly ash particles, persistent organic pollutants, a variety of biological indicators, and the proliferation of plastic (Zalasiewicz et al. 2016).

The AWG, which holds a measure of authority given its role in convincing the official International Commission on Stratigraphy to formally declare the Anthropocene, has also concluded that the mid-twentieth century (somewhere between 1945-1964) should be designated as the start date.
of the earth will remain for many, many generations. So too, the AWG has determined that the mid-20th century should mark the onset of the Anthropocene, but based upon the rise in consumption patterns and industrialization, the proliferation of new anthropogenic materials appearing in sediments (including plastics, and concrete), and the spikes in fallout radionuclides and particulates from fossil fuel consumption (Zalasiewicz et al. 2015).

The second option, and ultimately the one Lewis and Maslin settle on, is the 1610 ‘Orbis Spike’, which reflects the low point in a decades long dip in atmospheric CO$_2$, caused by the death of upwards of 61 million people in the Americas from colonial violence and disease brought upon Indigenous inhabitants. The annihilation of the Indigenous population caused a significant decline in farming and other human activities that reduced pre-industrial CO$_2$ levels to their lowest in 2000 years. This global event also contains within it other auxiliary markers. It represents the emergence of the first global trading network, which connected Asia, Africa, Europe, and the Americas and allowed for the mixing of biota, known as the Colombian exchange. The globalization of foodstuffs, including corn, maize, livestock, and wheat, as well as the accidental mixing of other foreign, non-invasive/invasive species of flora and fauna radically reorganized life on Earth without geological precedent (Lewis/Maslin 2015: 174). In this radical reading, the Anthropocene emerges with the discovery of the New World. It therefore implicates genocide and colonial violence as a physical stamp on and beneath the face of the earth. As the authors write:

The Orbis spike implies that colonialism, global trade and coal brought about the Anthropocene. Broadly, this highlights social concerns, particularly the unequal power relationships between different groups of people, economic growth, the impacts of globalized trade, and our current reliance on fossil fuels. (Ibid: 177)

Indeed, both events—the Orbis hypothesis and the zenith of nuclear testing—represent the capacity of humans to enact violence, war, and destruction. Both are perhaps examples of humans simply being “rapacious primates” (Gray 2002), deeply enmeshed with social and material actants. In this reading, the Anthropocene entangles political, economic, cultural, technological and material processes, bridging oft-
divided critical discourses of social science and humanities with the natural sciences.

Given these and other reasons, it is discomforting, to put it mildly, that the disciplines of international relations and criminology maintain their silence on the Anthropocene. This marginalizes these security disciplines at a time of growing fascination with the Anthropocene as both a popular concept and a scientific concept. Hundreds of articles are written per year on the Anthropocene, from a diverse range of disciplines. It has generated enough publicity and rigorous debate to become something even more than a buzzword; it can now be seen as a true signifier. The performative act of declaring the Anthropocene works to instill or reinforce new understandings of the interactions between humans and the Earth system. While the idea that humans and nature interact is not new, there is something different about the Anthropocene; it ushers in, and reflects, a realization that the dynamic scale and impact of human activities is world-making. While the idea of humans making worlds has long been recognized within the social sciences, the worlds being made have never included the planet itself—this has always been conceived of as immune. The effects of this expansion of world-making are profound; both in terms of the physical earth changes and in terms of the deep philosophical challenges that are raised in a world where distinctions between humans and things are not simply being blurred, but erased. And in this new world, states of normalcy and exception are increasingly indistinguishable. This has enormous consequences for our perceptions of security.

**Security in the Anthropocene**

Despite significant advancements in well-being, this is an age of profound crisis, not triumph. One need only ask a resident of the Pacific island nation of Kiribati, or the town of Kivalina, Alaska, whose communities will soon be swallowed by rising seas, about the risks that accompany the technical ability of humans to appropriate the benefits of nature—risks that, as Ulrich Beck (1992) has argued, we have created, but are outstripping our ability to resolve. These communities are one of the many casualties of carbon.
Ours is, and will be, a perilous age. We are going to live for some time in this age that we have done so much to make. How might we live? There is much evidence at present to suggest that we will simply continue down the track of carelessness that has gotten us to where we are. For many this is inevitable for both genetic and institutional reasons and thus cause for mourning—a “requiem for a species” according to Clive Hamilton (2010). We are locked into who we are and have become. Our safe spaces are gone, never to return. Instead of learning to live, we must “learn how to die” (Scranton 2015). For others, particularly the optimists of the ‘eco-modernist’ movement, our present age, while perilous, is also an age of opportunity that we can grasp. Our aptitudes for innovation and technology can lead us to co-design a new world that transcends the nature/culture divide. Humans have a historical propensity for resilience and adaptation in the face of adversity. Today and into the future we should ramp up the use of nanotechnology and geoengineering to craft a ‘good Anthropocene’ (Asafu-Adjaye et al. 2015).

Lying between these stances is a position that accepts what is, what our Holocene sensibility of sustained carelessness has produced, and then seeks to construct a sensibility, out of which action flows (Shearing/Ericson 1991) that is appropriate for Anthropocene security—an ethos of care. Its premise is simply that, whether as a species our security is won or lost, or whether as a species we live or die, we have an opportunity to act collectively and virtuously as co-inhabitants of the Anthropocene. Discovering what it means to be co-inhabitants of the Anthropocene is the challenge that Bruno Latour invites us to take when he advocates that we must learn to “love our monsters” and “care for our technologies as we do our children” (Latour 2011a) Fortunately, these are bootstraps upon which we can pull. We know much about how to care and we have done so in many ways. But can we construct visions of care that become part of new logics of security for the Anthropocene? Can we extend caring relations to others beside humans? Perhaps most importantly, can we do so in time? For Rifkin (2009), the question is how might we extend empathy so as to create a “global consciousness” that is as pervasive, and as embedded, as the consciousness of carelessness that has pervaded the Holocene. It is to these possibilities of care and carefulness that this book turns.

The book follows a general trajectory that reexamines humans, nature, and security in light of the Anthropocene age. The next chapter, “More-
Than-Human Worlds” argues that one of the primary ways that we move security out of the Holocene is through a prolonged investigation of the anthropos in security, both as subject and object. It is clear that our ideas of security have been overwhelmingly anthropocentric, which is to be expected. All the (dis)orders of security (critical, traditional, postcolonial, etc) have been built upon ontological conceptions of the human individual. By creating order through a demarcated inside and outside, security studies have relied upon and perpetuated the dualist understanding that sets humans apart from other species, nature, and each other (Cudworth/Hobden 2011). As the chapter will show, viewing humans as intrinsically linked (though not bound) to other modes of being, including organisms, animals, machines, feedback systems, etc, can open up a new understanding of power, sovereignty, responsibility and harm, as well as new, immanent possibilities for action.

Chapter three, “Postnatural Security” begins with the question: what is natural in security? Or, how are ‘nature’ and the ‘planet’ conceived of and used within security disciplines as well as by states and other international actors? We argue that traditional security studies and policies have relied upon an understanding of the natural environment that confirms and abides a homogenous vision of security, whereby the state is the referent object of protection, and the natural environment therefore exists to be managed, controlled, exploited, and preserved at the behest of perceived national and community interests. Conversely it argues that conceptions of the Earth, and nature have conditioned security practice itself—from depictions of natural resource abundance, to control of water, to the natural physical barriers to invasion accorded to some states.

In Chapter four, “The Horizon of Holocene Security” we ask: without a coherent conception of nature or the human, what does security mean in the Anthropocene? This chapter tries to answer this by showing how, despite the end of the Cartesian dualism inherent to Holocene security, security remains an absolutely central principle in our lives. However, we argue that the Schmittian-inspired politics of the exception, upon which securitization theory rests, are increasingly challenged by shifts in the Earth system that point toward a future where ecological exception becomes the norm. The effects of this may be for an increase in state-level securitizations of environmental issues. Or, it may also present new opportunities for theoretical developments and policy-oriented action that considers the normative implications of ecological exception within
security and challenge nonhuman understandings of security. That is, the growing awareness of complex system-level linkages may help avoid the dualistic logic of securitization where politics exists as either ‘normal’ or ‘exceptional’, actors are either ‘friend’ or ‘enemy’, and life is either ‘secure’ or ‘insecure’.

Chapter five, “Towards a Security of Care in the Anthropocene,” begins by asking: what kind of security should we have in the Anthropocene? We quickly conclude that we cannot offer a blueprint or a political plan of action for righting the ship. The Anthropocene does not allow it. So with what are we left? Nihilism? Despair? Perhaps these have always been quintessential buzzwords of security but they will not get us very far. We instead propose that to live and die in the Anthropocene requires us to probe an abstract and transcendent ethos of security based on the notion of care. Care compels us to act responsibly in relation to others, without relying upon restricted forms of global justice or moral cosmopolitanism that are troubled by Anthropocene logics. Care represents a promising, if also problematic, approach to security in the Anthropocene, the age of ‘shared threat’. It will not save us necessarily (perhaps we are irredeemable) but it can show us that that there exist possibilities of response in a troubled time. Our last chapter, fittingly titled “Conclusions” offers a summary of our positions and puts forth a defense against anticipated criticisms. We finish by briefly outlining potential new directions for further research.

If we reduce security to its purest form—the reduction of harm—or what Jeremy Waldron (2010: 117) refers to as the “pure safety question”, then the Anthropocene concept presents some real problems. The scale and scope of global environmental change forces us to confront a torrent of interlinked insecurities with causes that are too complex and emergent to fully comprehend, coming from sources that are at once nonhuman and distinctly human-led. Likewise, these insecurities are temporally distant, cross-species, and often locked in. Even when security is understood outside of its ideal form, whether through traditional or critical approaches, we are still left with hegemonic discourses that are infused with anthropocentrism and linear forms of causality. Security in the Anthropocene offers no promises. It exists neither as protection nor prevention. The realities of the Anthropocene signal to us the urgent need to research and theorize new, diverse understandings of security that can help us cope with expanded forms of existential risk. Sometimes too we
need to marry these new approaches with very old ways of understanding the world that have, for various reasons, been suppressed. The chapters that follow should be read as necessary provocations for an age that defies easy classification yet demands that we look directly upon it; that we return its gaze.