Back to the Future: Environmental Security in Nineteenth Century Global Politics

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ABSTRACT

Environmental security is generally held to be a contemporary or even futuristic concern. However, as with many facets of security thought, this overlooks how the unparalleled technological, economic and social changes of the 19th Century forged much of the international political landscape we now inhabit. The tendency for ecological political enquiry to focus on the rise of ecocentric policy serves to obscure how many aspects of national and human security relating to environmental change were apparent in the 19th century. Human insecurity in the face of pollution and resource depletion was a part of the emergence of ecological science in response to the industrialization of Europe and North America. In addition, this was the era when European imperialism reached its apex and European nationalisms fully emerged; both of which contributed to the national securitization of the environment around much of the world in contrasting ways as the desire to both conquer and preserve nature became more evident. Environmental questions of national, human and ecological security are not peculiar to the present age and were very much apparent in 19th Century global politics.

Keywords: environmental security, nineteenth century, securitization

1. Introduction

Whilst it is generally held to be a contemporary or even futuristic concern, many of the issues of environmental security were very evident during the initial industrialization of Europe and

North America over a century before their popularization from the 1960s. As with many facets of security thought, the 'securitization' of environmental issues over the past fifty years overlooks how the unparalleled technological, economic and social changes of the 19th Century forged much of the international political landscape we now inhabit. Though the term 'environmental security' is relatively new and still contested, its applicability dates back to the onset of the industrial revolution.

Environmental security has diverse meanings; variably invoked to refer to how national or human security can be threatened by environmental change or how the environmental itself can be rendered insecure. A conservative, statecentric understanding of the term views it as: 'intersection of environmental and national security considerations at a national policy level'(Allenby 2000: 5). From a human security perspective environmental security can be defined accordingly: ' When people do not have enough options to avoid or adapt to environmental change such that their needs, rights and values are likely to be undermined, then they can be said to be environmentally insecure' (Mathew, Barnett, McDonald & O'Brien 2010: 18). From either a human or national security perspective environmental security emerged as a concept from the 1990s intended to signify a heightened significance for issues of environmental change beyond that already apparent in the politicization of nature inherent in the rise of political ecology.

The prevailing wisdom is that, whilst the science of ecology was born in the 1860s, political ecology, making the environment the referent object of concern, did not emerge until a century later. Ecocentric policies emerged in the aftermath of Rachel Carson's *Silent Spring* in the early 1960s which prompted the restriction of organochlorine pesticides (such as dicholoro-diphenyl-trichloroethane DDT) in the US, even though they were profitable and

useful to man, because of their proven negative effects on several bird species' (Carson 1962). As such this appeared to represent a paradigm shift from environmental political and legal measures of earlier years which, ultimately, remained anthropocentric in that they sought to conserve nature for aesthetic or economic reasons (such as in protecting birds that were agriculturally useful in pest control).

Political Ecology is very widely (and maybe universally) held to be an ideology born of the 1960s and the rise of ecocentrism and, usually, some years after Carson's breakthrough. Robbins distinguishes between political ecology and a much older 'apolitical ecology', the latter of which is concerned with resource depletion but without addressing the economic structures- capitalism and imperialism- that are the principal cause of problems such as 'eco-scarcity' (Robbins 2011). The term itself is sometimes attributed to an anthropological article by Wolf in 1972 (Wolf 1972) though Hoffman & Graham contend that the 1960s was the starting point for the ideological approach (Hoffman & Graham 2006: 370-391). Similarly, Harrison & Boyd reason that Political Ecology did originate with Carson the 1960s and that environmental policy prior to then was more a case of 'romanticism' in terms of human relations with nature (Harrison & Boyd 2003). Barry acknowledges some deep roots of political ecology in the industrial revolution but argues that the ideology evolved in three stages from the 1980s (Barry 2014). Peet & Watts consider that political ecology emerged from the 1970s (Peet & Watts 1996; Watts 2013) whilst LeBillon & Duffy concur with Barry and believe that it was not until the late 1980s that ecocentric thought truly took form (Le Billon & Duffy 2018). Peet and Watts define political ecology as: 'a confluence between ecologically rooted social sciences and the principals of political economy' (Peet & Watts 1996: 6).

This chronology of ecology This is broadly but not completely accurate. Whilst much environmental policy that did emerge in 19th Century Europe and North America sought to conserve nature for human interests (whether economic or aesthetic), some ecocentric (as opposed to anthropocentric) protection of biodiversity also occurred. Additionally, the assumption that ecocentricism originates in the 1960s is Eurocentric. Oneness with nature is long-established in many of the cultures around the world which came to be particularly overshadowed by the further advance of European imperial dominance, such as Hindu, native American and Inuit. It was hunters from the South who depleted the Arctic's seals and whales in the 18th and 19th Centuries not the indigenous peoples respectful of their prey and schooled in the arts of sustainability.

The tendency for enquiry in political ecology to focus on the rise of ecocentric policy serves to obscure how many aspects of national and human security relating to environmental change were apparent in the 19th century (and, indeed, in the pre-industrialized world). Human insecurity in the face of pollution and resource depletion was a part of the emergence of the science of ecology and the politics of conservation from the 1860s. Whilst neither human security nor environmental security existed as concepts at this time the idea that the state had a duty to protect its citizens against environmental harm was apparent. Social security was part of the political lexicon of the late 19th Century long before national security came to be popularized. Starting in Bismarck's Germany the idea that people had a right to be protected against the negativities of industrialization manifested itself in the emergence of state welfarism. Without doubt state welfarism served the national interest since a healthy and happy population provided better forces for the factory and the battlefield but human as well as state security stood to gain by acting against pollution and resource-depletion.

The nineteenth century was also the era when European imperialism reached its apex and European nationalisms fully emerged; both of which further contributed to the national securitization of the environment in contrasting ways. The romaniticization of the countryside in the face of industrialization formed part of many European nationalist movements that emerged in this era whilst, at the same time, conquering both nature and 'pre-modern' human cultures was a component of imperialist expansion outside Europe. This article is a broad survey of how environmental change invoked human and national security on the international stage long before the recent popularization of this notion. The focus is somewhat Eurocentric since Europe dominated the nineteenth century world to an extent unparalleled in human history. Environmental questions of national, human and ecological security are not peculiar to the present age and were very much apparent in 19th Century global politics. Appreciating the environmental insecurities of the 19th Century helps remind us how the meaning of security came to be distorted by the rise of total war in the 20th Century. Human insecurity in the face of environmental change far predates the popularization of the concepts of human or environmental security in recent decades.

2. The Ontology of Environmental Security

A primary reason for the notion of environmental security rarely being related to 19th Century politics is that there is no agreement on what this concept actually means. Whilst the concept has acquired much currency over the past quarter of a century, there is no clear consensus on how 'the environment' comes to invoke security. Is the referent object to be secured the state, 'the human' or the environment?

The question of whether environmental problems merit the politically significant label of 'security' is a complex one and highly contested. In essence there are four positions that have evolved:

i, *Traditional International Relations Realists* reject the coupling together of the environment and security either or both because environmental degradation is not considered significant enough to merit such a label and the contention that the politics of 'security' is about the military defence of the state, not tackling problems of biodiversity or pollution (Mearsheimer 2001).

ii, Security Wideners consider that environmental challenges can invoke the politics of security but only if they can be seen to cause wars or threaten the sovereignty of states. The contention that 'water wars' could be triggered by the increased scarcity of that most precious of resources is a prominent example (Homer-Dixon 1994; Kaplan 1994). Beyond linking resource depletion and traditional national security concerns, however, there is little appetite for environmental security in this approach: 'it is not exactly clear, for instance, how military forces can help reduce the build–up of greenhouse gasses in the atmosphere to prevent global warming' (Wirtz 2007: 339).,

iii, *Traditional Political Ecologists* resist 'securitization' through concerns that this risks invoking inappropriate, militaristic 'national security' responses to complex environmental problems. In most countries 'security' has come to be synonymous with military defence. Since militarism is environmentally-damaging and serves to distract political attention from other important issues most political ecologists see this as inherently problematic (Deudney 1990). The green roots of political ecology lie in the social rather than political sciences. It is an approach born of the critical turn in anthropology, development studies and political economy rather than political theory or International Relations. Blaikie and Brookfield argue that:

'the phrase "political ecology" combines the concerns of ecology and a broadly defined political economy. Together this encompasses the constantly shifting dialectic between society and land-based resources, and also within classes and groups within society itself '(Blaikie and Brookfield 1987: 17). The focus of political ecologists who emerged from the 1980s was land ownership, economic structures and conflict in a much wider sense than inter-state wars. In contrast, the roots of environmental security lie very much in international relations scholarship which, traditionally at least, is a discipline that critical social scientists tend to distance themselves from as being politically conservative, statecentric and methodologically positivist (Zwierlein 2018). The emergence and popularization of the resource wars approach (including its 'real world' influence on governments such as in Washington and London) served to reinforce this perception. However, this also served to blind mainstream political ecology to emergent human security approaches keen to embrace environmental concerns and move IR beyond conservative statecentricism. In addition, the focus on 'who gets what' in terms of land and resources tended not to consider the wider public health consequences of pollution and environmental change that were accommodated in the human security approach (Peet & Watts 1996).

iv, *Human & Critical Security International Relations Scholars*, receptive to the ontological and epistemological challenges to the conventions of the discipline that emerged following the end of the Cold War, contend that environmental problems can and should be 'securitized' by abandoning the traditional preoccupation with the state and military defence and mobilizing global responses to different kinds of threats to life. In this view securitization does not have to mean 'sending in the troops'. Rather, it can mean giving life-threatening issues like ozone depletion or climate change the same level of political prioritization traditionally given to military defence (Dalby 2002; Mathew *et al* 2010, Hough 2014).

Hence today the concept of environmental security is viewed as unwelcome on both sides of the 'political ecology spectrum'. Traditionalists in IR and Political Ecology both resist 'environmental securitization' in principle. Given this it is unsurprising that the emergence of the science of ecology and politics of conservation amidst the industrialization of Europe and North America has rarely also been considered the breeding ground of environmental security. However, from either a widened or human security perspective, environmental change in the 19th Century world was highly relevant in a number of ways that will now be discussed.

3. The Rise of Ecology

The science of understanding matters of environmental change emerged in the nineteenth century and was given the name *ecology* by the German Biologist Haeckel in 1866 (Haeckel 1866). Ecological science brought recognition of natural systemic phenomena linking disparate life forms such as food chains, the carbon cycle and evolution and an understanding of humanity's place within the environment. As with environmental or human security, though, the crystallization of the terminology followed the evolution of understanding the phenomenon. The rise of botanical studies and forest management in the 18th Century advanced ecological understanding as did many other studies of the human place in the world dating back to ancient Greece. Two years before this first usage of the term ecology US diplomat George Perkins Marsh had penned the landmark *Man and Nature*, widely regarded as the first ecological book in that it used empirical data to prove the negative effects of human activity on woodlands and waterways. Drawing on research Marsh carried out whilst serving as the US ambassador to Italy, *Man and Nature* begins with an overview of how much of the forested and fertile Roman Empire had gradually become unproductive arid wasteland, through overproduction. Hence Marsh was discussing desertification over half a century before the term came to be employed. The book was also ahead of its time in foreseeing the links between deforestation and flooding. Whilst *Man and Nature* is more of a scientific than political work,

in examining the effects of major engineering projects and urbanization on nature and questioning their legitimacy there is no doubt that Marsh's observations on the changing European landscape sowed the seeds of Political Ecology and environmental security (Marsh 1864). Marsh's analysis lacks the political economy focus favoured by political ecologists a century later but his appeal for human activities to be curtailed for nature's and humanity's sake is a political call that is both ecocentric and environmentally-anthropocentric.

In the wake of this scientific revolution of the 1860s pressure groups campaigning for conservation began to emerge in the US and Western Europe. The British Royal Society for the Protection of Birds (RSPB) became the world's first conservation pressure group when it was founded in 1889, through fears that *grebe* birds were in danger of extinction due to the fashion of using their feathers for hats. Ten years later, Naturschutzbind Deutsch (German Union for Nature Conservation NABU) was founded in similar circumstances, though it evolved to also promote the protection of flora and fauna other than birds. In the US the Sierra Club, founded in 1892 by Scots-born John Muir, sought to build upon the idea of designated conservation zones to protect the natural environment established by the government twenty years earlier with the world's first national park at Yellowstone. These conservation organizations, and others formed in this period like the UK's National Trust, remain highly influential today.

The origins of international policy on issues of environmental change can also be traced back as far as the era of as-then unparalleled industrialization and globalization that was the late nineteenth century. Possibly the first formal international treaty conserving fauna was the 1876 Jan Mayen Seal Fishery agreement by which the Dutch, British, Germans, Russians, Norwegians and Swedes, mindful that they would soon exhaust supplies, agreed to

geographical and seasonal restrictions on seal hunting in the Arctic Ocean east of Greenland. The first international treaty dealing with flora evolved between 1878 and 1889 with France, Germany, Italy, Austria-Hungary, Italy, Luxembourg, Portugal, Spain and Switzerland agreeing to cooperate in order to prevent the spread of the disease *phylloxera* in grapes. A Treaty seeking to avert overfishing was also ratified by all of the North Sea states in 1882 and similar agreements were made for salmon fisheries, the Rhine states in 1885 and Russia, Norway and Sweden for the Tome River (which runs along the Finnish-Swedish border) in 1897. The Convention for the Protection of Birds Useful to Agriculture, ratified by 8 European states- including France and Germany- in 1902, then became the first international legal instrument on non-marine animal conservation (Hough 2014: 3-5; Kaufman 2018: 12-16).

These domestic and international agreements were motivated principally by economic rather than environmental concerns. Internationally traded foods and wine were at stake in ratifying the treaties rather than the flora and fauna themselves. The grapes, birds and fish being protected were the subject of such concern because of their *instrumental* rather than *intrinsic* value. Similarly, the blossoming of international conservation policy in North America in the early 20th century, seen with the emergence of the North Pacific Fur Seal Convention (1911) and Migratory Birds Treaty (1916), was a result of US and Canadian public opinion mobilizing by a combination of aesthetics and economics (Dorsey 1998). This distinction is the key to determining whether a political issue is truly ecological (Political Ecologists generally prefer this term to 'environmental' since that can be thought to imply that the non-human world is a backdrop to the human world rather than the two co-exiting in a single *ecosystem*). In determining whether a given issue is an ecological one the key question is 'is the environment to be protected for its own sake or just when this furthers human interests'?

Hence conventional wisdom has it that ecocentric environmental politics did not emerge until the 1960s when legislation began to be drafted to protect nature for its own sake rather than for human interests. The restriction of the insecticide *dichloro-diphenyl-trichlorethane* (DDT) in the US when it became apparent that it was poisoning birds (and not just those 'useful to agriculture'), even though the chemical had been hugely successful in terms of increasing food yields and curbing malaria, is often cited as a particular watershed.

This analysis and timeline of environmentalism, whilst broadly true, is over-simplified. Ecocentricism and environmental security did emerge in 19th century Europe and North America a century before their full appreciation. Ecology in the 19th Century was mainly scientific but also occasionally political. Likewise policy in this era was mainly anthropocentric but also, occasionally, ecocentric. Despite his influence on Roosevelt and association with national parks established primarily for human hunting and aesthetic interests John Muir was far more than a conservationist and his work fiercely critiqued anthropocentricism: 'Why should man value himself as more than a small part of the one great unit of creation' (Muir 1916: 139). Muir was a *preservationist* protecting nature from man rather than form him and, as such, can more clearly be linked to contemporary political ecologists and an approach to environmental security that makes the environment to referent object of security.

Marsh also was clearly more than a part-time scientist and saw his literary work as contributing to the political world he inhabited: 'The great question, whether man is of nature or above her' (Marsh 1864: 549). The same is true of many of the other great environmental pioneers of that age. Often referred to as 'England's first environmentalist', the influential naturalist Gilbert White also expressed the ecocentricism and holism of contemporary

political ecologists. White's work emphasized the importance of all creatures and not just those useful or attractive to humanity. Similarly, great European thinkers of the age, like Von Humboldt and Morris, considered later, were more direct predecessors of contemporary ecological thought than is often recognized (White 1900) Van Humboldt & 1819: Morris 1888). The grebes that prompted the launch of the RSPB were not particularly useful to man and it is not the case that 19th Century conservation thought and policy was purely a product of "huntin', shootin', fishin'" elitists as is often assumed.

In particular, environmental concerns of the 19th Century often also became prominent because they had human and national security implications. The focus on ecocentrism over anthropocentricism in ecological thought tends to obscure this. Anthropocentrism is still very relevant in environmental policy today. The most prominent environmental issues today- climate change, ozone depletion or atmospheric pollution- are so principally because of their human rather than non-human significance. Such anthropocentric environmental policy can easily be reconciled with national or human security. Nineteenth century Europe and North America was the scene of much anthropocentric conservation policy enacted in the interests of elite aesthetics or recreation but also of anthropocentric policy tackling pollution and sustainability in order to alleviate human suffering and enhance state order.

The paternalism, nationalism and imperialism that explains 19th Century environmental change and also the political responses to it is not palatable to most contemporary political ecologists. Nevertheless, we can observe, in a number of ways, that environmental security was invoked in 19th Century Europe and North America: i) In domestic politics as a counter-response to industrialization and ii) in international politics in the context of sustaining imperial rule, both informed by scientific advances in the appreciation of the natural world.

4. Environmental Securitization via scientific advance and industrialization

The two principal reasons behind the rise of political ecology in the 1960s and the subsequent securitization of the environment were concerns over two collective goods problems that challenged the atomistic state system: resource depletion and transboundary pollution. Fears of overpopulation and the related concern of key resources, like foodstuffs and oil, coming to be depleted challenged the whole established premise that states should focus on their own economic growth. At the same time, recognition that the polluting costs of industrial development could be incurred by countries not responsible for the emissions served to move such decisions beyond a national cost-benefit analysis. However, these political dilemmas did not suddenly manifest themselves in the 1960s. Both of these challenges had previously become very much apparent during the industrialization and proto-globalization of the nineteenth century. Contrary to much popular appreciation, acid rain, climate change and overpopulation were apparent and appreciated in the 19th Century world.

4.1 Resource depletion

The first well-known expression of concern that the Earth's resources were finite and threatened by overpopulation came at the end of the 18th century with the publication of 'An Essay on the Principle of Population' by the British economist Thomas Malthus. Malthus reasoned that famines would become more commonplace as resources- particularly food- would soon be exceeded since: '[T]he power of population is indefinitely greater than the power in the earth to produce subsistence for man' (Malthus 1798: 23-24). Whilst famines did indeed blight the 19th Century world, this Malthusian equation never manifested itself but not because his line of argument was flawed. The world's population and resource consumption

grew at rates greater than ever in history((from 990 million in 1800 to 1.65 billion in 1900 Roser, Ritchie & Ortiz-Ospina 2019)) but so did its food supply as a result of the Industrial Revolution, which served to increase crop yields and also improve resource extraction. Notwithstanding this illustration of human ingenuity overcoming a potential environmental threat, early resource scarcity fears nevertheless did come to manifest themselves in other dimensions in the nineteenth century world.

In 1968 the 'Neo-Malthusian' US Ecologist Garrett Hardin popularised a cautionary parable first aired in the nineteenth century by the British Economist William Forster-Lloyd on the finite quality of shared resources, known as the 'Tragedy of the Commons'. Forster-Lloyd described how the traditional English village green, conventionally open to all villagers, had become endangered because of an abuse of the privilege by the villagers in overgrazing their cattle. As the practise had gone on for centuries it had been assumed that it always could but it had emerged that an increase in the number of cattle above an optimum level was eroding the land and ruining the common resource for all (Forster-Lloyd 1873).

Common woodlands became analogous to Forster-Lloyd's village greens as the increased strain on the key resource of timber became a widespread concern across all of industrializing Europe. That this came to be viewed as a matter of national security is evidenced by prominent state interventions in the face of these tragedy of the commons scenarios. A National Board of Forestry was created in Finland in 1859 bringing much of the country's vast woodlands, previously considered common land, under state control. In 1886 the Forest Act then sought to make the timber industry sustainable. In Russia, which at that time was Finland's imperial ruler, deforestation also prompted a nationalization of nature in the face of a timber

shortage. Unlike Germany or Britain Russia did not industrialize until the 20th century but experienced profound social change in the late nineteenth century owing to the abolition of serfdom by Czar Alexander II in 1861. The Serfs had previously worked the woodlands on a small-scale basis but their liberation had seen logging companies take over and feed a growing demand for timber at home and abroad. As with the Finnish policy, the 1888 Resolution on the Preservation of Forests brought in the widespread state control of woodlands and actions seeking to make the industry sustainable. Also introduced were further measures aiming to enhance environmental security in another dimension by specifically addressing deforestation on river banks and hillsides through recognition that this was a cause of increased flooding and landslides (Teplyakov *et al* 1998: 5-7). Again illustrating that nineteenth century Europe was grappling with sustainable development long before it entered the political lexicon, this remains a pressing issue for many developing countries today.

For the neo-Malthusian's the ultimate solution to the problem of resource depletion was beyond better management and required addressing demand as well as supply by curbing overpopulation. Hence population control subsequently became a central plank of the rise of political ecology and a major international political concern in the late 1960s and early '70s. However, birth control was also a central proscription of Malthus, before overpopulation concerns receded with industrialization and modernization serving to both increase supply and reduce demand. One particular manifestation of this Malthusian thinking was as clear a case of a disastrous environmental insecurity afflicting Europe as you could find: the Irish famine of the 1840s. Over a million people perished after potato blight near-eliminated the country's staple food crop. What was particularly striking about this tragedy was that it occurred in the world's richest country since Ireland had been united with Great Britain at the start of the century. It also occurred at a time when Ireland was exporting grain to a rapidly expanding

and liberalizing global economy. For Malthus the 'ignorance and barbarism of the people' (Malthus 1803: 291-292) had led them to have too many children and be overly-reliant on the potato. After an initially interventionist response from London under the Peel government, the successor Russel administration were won over by this Malthusian logic and ceased sending relief across the Irish Sea through concerns that this would undermine the capacity of market forces to respond to the food shortfall. That the Irish were over-reliant on the potato was undoubtedly true but this ignores the fact that this was born of necessity rather than choice since the post-colonial persistence of a feudal system of land ownership left the peasants to farm on poorer soils fit only for tubers whilst their landlords grazed cattle and grew wheat. In fact, Malthus himself did recognize that the division of Irish land was a contributory factor to the famine (*ibid)*.

Elsewhere in Europe potato blight exacerbated by feudal land ownership was a contributory factor to the fermenting of political discord that particularly manifested itself in the 1848 'Year of Revolutions'. The heightened environmental insecurity of peasants experiencing unnecessary food shortages allied to increased enclosures into common lands they could previously utilize, due to their appropriation by the aristocracy, proved a trigger for revolts and the genesis of both nationalism and socialism across much of the continent. Uprisings across the Austro-Hungarian empire, Prussia, France, Denmark, Poland, the Italian states and elsewhere shook the continent at a time when the 'Concert of Europe' seemed to have created a golden era of both continental order and global dominance. Hence in the middle of the 19th Century both human and state security were clearly at stake as a consequence of the central environmental and political question of equitable resource management.

The uncharacteristically cordial diplomatic atmosphere of the Concert of Europe system that was created after the Napoleonic wars provided the opportunity for the pioneering collective co-management of some key resources. The world's first Intergovernmental Organization the Rhine Commission, established at the Congress of Vienna 1815 came to embrace conservation measures as it evolved through the century. Initially driven by the commercial utilitarianism of setting a common toll for Europe's premier trade route, the landmark organization later came to have some important conservational dimensions. In particular, the 1868 Mannheim Convention updated the original founding treaty to prohibit the dumping of waste into the river. This agreement was initially more about negating navigational disruption than ensuring water quality but, in an early illustration of political spillover, the regime later came also to address this. The 1885 Treaty on the Regulation of Salmon Fishery was a first clear instance of this as were more explicitly environmental measures later enacted by the parties in the twentieth century (Kiss 1985).

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Outside of Europe, but within its geopolitical reach, the 1893 Pacific Fur Seal Arbitration sowed the seeds of global judicial and environmental law when the UK and US agreed to avoid a dispute over the Bering Sea north of Canada and Alaska escalating into war. The US had taken to intercepting British seal hunting vessels outside of their territorial waters through frustration that their former colonial masters were undermining their domestic attempts to avoid the extinction of this valuable sea mammal. The landmark arbitration panel of independent jurists found in the UK's favour (5 to 2). Whilst, ostensibly, this ruling was a triumph for sovereignty and commercial freedom over conservation, the latter was nevertheless boosted in the panel's further recommendations. The parties agreed to the future co-management of the high sea including restrictions on hunting methods and a closed

season. This agreement was later codified in a 1911 Treaty and also set a precedent for international conservation measures thereafter (Sands, Peel & MacKenzie (2012); Byers (2013)).

Whilst industrialization, modernization and scientific advance sealed European global dominance and averted Malthusian overpopulation fears, these developments also brought new threats to these countries as unprecedented stresses on resources and societies came to be exerted. Millions of Europe's citizens died and many of its states were compelled to reform or die as a consequence of the mismanagement of the continent's resources. The unifications of Germany and Italy, and the later break-up of the Habsburg Empire, Irish independence and Russian Revolution can be connected to this most fundamental of all political and environmental concerns. A link between environmental resource management and security in 19th Century Europe could hardly be more explicit.

4.2 Pollution

As with resource depletion, the heightened threats posed by pollution became starkly apparent in industrializing Europe and North America. Over a century before the phenomenon formed the vanguard of the political ecology movement in Europe acid rain was identified by British chemist Robert Angus Smith in 1859 and subsequently campaigned about by foresters and scientists in Germany (where Angus Smith had previously lived and studied) in the 1860s (Reed 2014; Dominick 1992). Similarly, the science of climate change was established as early as 1896. Swedish chemist Svante Arrhenius, later a Nobel Prize winner, published a paper which can lay claim to have established the link between fossil fuel emissions and global warming (Arrhenius 1896). Human-induced climate change was not portrayed as a security threat by Arrhenius but the fact that the link between industrialization

and environmental change was identified over 120 years ago is instructive if we consider how appropriate action on the dire human consequences of this today is hampered by industrialists and politicians wilfully ignoring this for supposed national interests.

As the countries at the forefront of the industrial revolution- and the scientific advances and social changes associated with this- Britain, Germany and Sweden also pioneered environmental policy in Europe. In Britain the Alkali Act was enacted in 1863 due to recognition that the booming Leblanc soda production process was filling the atmosphere with hydrochloric acid and, in recognition of his role in identifying this, Angus Smith was appointed head of the Alkali Inspectorate set up to implement new industrial restrictions (Reed 2014). In a similar illustration of the catalytic effect of scientific discoveries on environmental policy still evident today, the Public Health Acts of 1848, 1872 and 1875 and the River Pollution Prevention Act of 1876 followed the establishment of the link between water pollution and cholera in Britain by Dr John Snow. Five major public inquiries fed into the 1876 Act to establish solid grounds for imposing costs on British industry to develop clean technology (Pontin 2014: 766). In Germany the Technische Anleitung Luft in 1895 was a clean air act passed by the Reich which, in keeping with the new state's devolved political system, permitted stricter than federal restrictions on industry to be imposed by Lander (Hanf & Jansen 1998: 278-9). Sweden introduced its first Public Health Act in 1874, establishing Public Health Boards in all major towns to monitor water and air quality, and Finland followed suit five years later. Pharmaceutical advances in France, led by Louis Pasteur, also made great contributions to advances in public health across Europe although a strong role for the French state did not manifest itself until the 20th Century. Across the continent the fact that the Industrial Revolution required taming in spite of its huge contribution to economic growth was well-established by the end of the 19th Century.

These pioneering anti-pollution measures are somewhat neglected in the analysis of environmental policy because they were not ecocentric. However, these public health interventions were acts related to environmental security in so far that they were protecting the air and water in ways that were contrary to economic interests for the sake of human and state security. The primary motivation for contemporary policy on climate change, ozone depletion or pollution in general is essentially the same. This use of scientific reason to meet the human interest was in line with the utilitarianism of Bentham and the Liberals, particularly prevalent in Britain in this age (Pontin 2014). At the same time, in line with emergent social security legislation in Sweden, Britain and particularly Germany, these measures can equally be construed as politically conservative. Along with new social security measures protecting workers, these 'Bismarckian welfare' reforms from above intended to prevent revolution from below. This is somewhat akin to recent Chinese anti-pollution measures driven both by scientific comprehension of the human cost and governmental appreciation of the potential political costs of emerging urban discontent at growing smog levels. In 2013 the Chinese government, clearly responding to rising protest, announced a package of significant anti-pollution policies aimed at reducing key emissions by 30% over the next four years announcing: 'smog is visible and affects the life of everyone, rich and poor. It has been proven that environmental crises can stir controversy and greatly undermine social stability' (Coonan 2013).

5. Environmental Securitization via nationalism

Along with major scientific advances, European industrialization manifested itself in the rise of nationalism as modernizing societies came to be more aware of their and other identities

through state socialization (such as via education or conscription) and communications advances. This construction of national identities often particularly featured the glorification of the domestic landscape and romanticization of traditional rural culture. Thus the environment came to be valued by the state to a much greater degree than seen before and, to some extent, securitized. Hence the political right and aristocracy came to be more clearly associated with the advance of the politics of conservation in Britain, Germany, Scandinavia and elsewhere in the late 19th Century. In spite of peasant insecurities in the face of food and land shortages, conservation became chiefly an elitist 'top-down' movement, quite distinct from the more bottom–up middle class green new social movement that emerged from the 1960s.

In Britain this 'environmental nationalism' chiefly manifested itself around the preservation of lakes and village greens threatened by industrialization whilst in Germany deforestation was the key concern. Foster-Lloyd's 'tragedy of the commons' found expression in Britain in the Commons Preservation Society, established in 1865 by Robert Hunter, who later established the still influential conservationist group the National Trust. In 1883 the artistic and literary giant John Ruskin established the Lake District Defence Society which succeeded in restricting rail construction in England's most picturesque countryside. Ruskin, with fellow aesthete William Morris, also led the 'Back to Nature' movement which sought to challenge the whole notion of industrialization. Even more elitist in character than these proto-socialists, the leading Conservative politician of the age Benjamin Disraeli pioneered the Young England movement which, very much in keeping with the logic of the tragedy of the commons, equated the importance of property rights with the responsible stewardship of the land by the aristocracy (Pepper, Webster & Revill 2003: 135-139). In a similar vein, Forestry

Schools came to be established by German gentry, which later merged into the influential Congress of German Foresters in 1872 as part of their national unification process.

For the Norwegians their mountains were what lakes were for the English and the forests were for the Germans. Den Norske Turistforening (DNT) (The Norwegian Mountain Touring Association) was founded in 1868 in the fertile period of romantic nationalism after gaining independence from Denmark and prior to divorcing from Sweden. Ostensibly set up to promote tourism, DNT became a vehicle for projecting Norwegian national identity through the preservation and promotion of their unique landscape. In particular, DNT campaigned against the construction of hydro-electric dams and bought the legal rights to several waterfalls in order to preserve them (Van Koppen & Markham 2007). Italian nationalism also both romanticized and sought to tame their Apennine 'spine' and its peoples (Debarbieux 2011). In the US and other white settler states independence and national unity also came to be expressed via nature. The pioneering spirit underpinning this form of nationalism often equated human colonization with the conquest of nature (Garden 2014: 72, Kaufman 1998).

More clearly ecocentric whilst still a product of agrarian romanticism and patrician conservatism, was the emergence of policy for the preservation of birds in the 19th Century, which enjoyed the patronage of the aristocracy. In Britain the Sea Birds Preservation Act of 1869 was sponsored by Percy Duke of Northumberland. The Wild Birds Protection Act 1880 and later launch of the RSPB resulted from concerns at the possible extinction of birds favoured for hunting and plumage in hats was led by wealthy women Emily Williamson and Eliza Phillips. Similarly, in Germany the Bird Protection Bill of 1890 had the regal backing of the Hohenzollerns

This elitist, nationalistic and statist environmentalism of the nineteenth century is quite distinct ideologically from the transnational, socially-oriented political ecology of the late 20th Century. However, in terms of appreciating the evolution of the politics and security of the environment, this elevation of nature is of relevance. On one level the RSPB and Hohenzollerns were seeking to secure birds for the bird's sake (though also for their aesthetic value). On another level conservation came to be seen by the state as in the national interest; in material or aesthetic terms (Zwierlein 2018). Most pertinently in security terms this wave of 'naturalistic nationalism' (Kaufman 1998) paved the way for the environment to be raised in prominence in the power politics of war and imperialism to which we will ow turn.

6. Environmental Securitization via Military Ecocide

The rise of nationalism and the associated nationalization and glorification of warfare in nineteenth century Europe also served to exacerbate these emergent questions of environmental depletion and pollution. The scale of the Napoleonic Wars raised the stakes in European inter-state rivalry and laid the foundations of total war as whole nations became embroiled in the war effort. The industrialization of warfare heightened the insecurity of resources and also saw the environment become more central in military strategy.

Scorched earth tactics date back to ancient warfare but were refined and even revered in the Napoleonic era as war industrialized and nationalized. The 'backs to the wall' tactic of destroying your own resources to prevent an invading enemy making use of them became a particularly prominent military strategy. Most notoriously, Russian forces in 1812 retreated from the invading French army whilst destroying their own arable lands in an ultimately

successful strategy that paved the way for Napoleon's disastrous 'retreat from Moscow', which sowed the seeds of his downfall. This Russian strategy was learned from British military leader Wellington who two years earlier, in alliance with Portuguese guerrilla forces, had resisted a French invasion in the Peninsular War in a similar manner. French military power was build on its arable supremacy, allowing her to feed the biggest army in Europe, and this had come to be realized by those on the receiving end of her autarky (Hough 2016).

European imperialists also came to use systematic military ecocide, offensively rather than defensively, in the suppression of colonial insurgencies within their empires. The British employed such tactics in suppressing the 1817-18 Sri Lankan Great Rebellion-and again at the end of the century in the 2nd Boer War against Dutch settlers in the power struggle over South Africa. Such methods also came to be deployed defensively by colonials such as in the 1812-13 South American War of Independence by Argentine patriots defending against the Spanish / Royalists (Hough 2016). Weaponizing water or scorching the earth is contrary to the ethical codes of most non-European cultures, including Islamic, Buddhist and Hindu. Hence imperialism came to epitomize culture clashes between the industrialization, modernization and free trade of the Europeans and the ecocentricism of much of the rest of the world.

7. Environmental Securitization via Imperialism

As with domestic policy, a combination of government pragmatism and influential scientific opinion was responsible for the advance of environmental policies in the context of imperialism in the nineteenth century, when Europe dominated the globe like no time before or since. Whilst the ecocidal taming of perceived savagery, both human and non-human, characterised many imperial conquests there was also an observable trend for a maturing of

colonial systems so that they became more sustainable in both an economic and political sense. A Malthusian appreciation of the finite nature of resources, particularly in terms of the relationship between timber and naval power, was one dimension of this. In addition the rising science of botany came to be linked to both the exploration of new lands and the management of existing colonies (Grove 1995). In the late 18th Century British explorer James Cook's legendary voyages charting Australia and the South Pacific included Joseph Banks and Johann Reinhold Forster, the leading British and Prussian botanists of their day. Cook himself was a cartographer and astronomer and this merging of science and exploration in cross-national ventures became a general feature of European imperialism. In particular, a professional appreciation of the flora and fauna of colonies and the world in general hence became a component of imperial rule.

As also foretold in Cook's voyages, the transnational nature of emerging *epistemic communities* of botanists came to manifest itself in a significant degree of cross-imperial learning. The development of botanical gardens on Mauritius by the French from the 18th Century, aiming to conserve species, were imitated by British governors and botanists in the East India Corporation and in a major experiment on the remote Atlantic island of St Helena (Grove 1995: 332-242). St Helena was chosen consciously as a conduit between India and the West Indies to facilitate imperial exchanges of crops and in order to learn about conservation, climate and reforestation. In particular, William John Burchell, botanist at St Helena and then in India researched links between deforestation and soil erosion and flooding. At around the same time the governor Alexander Beatson (an open admirer of the 18th Century French governor of Mauritius Pierre Poivre) demonstrated a very early appreciation of climate change in noting the increased prominence of droughts across the world (Grove 1995: 358). Beatson was as much a scientist as a colonial administrator and his

work ‘Tracts’ is known to have influenced Charles Darwin, whose ‘Origin of the Species’ cites evidence from St Helena on the impact of encroachment by human and other life forms on ecosystems. Environmental degradation was more readily observable on lush, isolated islands than the urbanizing European landscape. Prior to Darwin the greatest naturalist of his age, the Prussian Alexander Von Humboldt- an associate of Banks and Forster- , linked South American deforestation to European colonizers.

> *By felling the trees which cover the tops and sides of the mountains, men in all climates seem to bring upon future generations two calamities at once; want of fuel and a scarcity of water.* (Von Humboldt 1819: 143)

Whilst it was more common to blame the pre-modern ignorance of indigenous peoples for resource depletion in the European colonies and neo-European colonies (such as the US, Australia and New Zealand) some cross-cultural learning also took place as the ingrained sustainability of local cultures became appreciated. Oneness with nature characterized many of the cultures of Europe’s imperial subjects, such as the Hindus, Buddhists and Native Americans and this came to be appreciated and appropriated. Hence we can see some instances of the traditional knowledge of colonials being valued. The French and British in Canada, for instance, learned the arts of sustainable beaver fur trapping from working with indigenous peoples (Beinart & Hughes 2007: 41). In addition to imperial learning, conservation sometimes came to be employed as part of efforts to appear to be good colonialists. For example, the Dutch in Indonesia introduced conservation measures for the Bird of Paradise, whose plumage was in demand for European fashion, in response to local protests (Cribb 2007: 54).

More clearly linking with contemporary political ecology and its emphasis on economic structures, Burchell's work in St Helena and India led him to draw parallels between enslavement and environmental degradation (Grove 1995: 350). The extinction of the dodo in the 17th Century and pioneering conservation experiments in the 18th Century provide contrasting faces of imperialism but the correlation between resources and empire is explicit.

8. Conclusions

Environmental security long predates its popularization from the 1990s or the rise of political ecology from the 1960s. Like many global issues, environmental concerns experienced something of an interregnum in the total war era of the twentieth century. The gap between the 1860s and 1960s is a somewhat artificial one. In much the same way international terrorism did not originate with Middle Eastern skyjackers in the 1960s- or Bin Laden in the 1990s- so much as with disparate anarchist assassins of the late 19th Century who, both protested against and utilized the opportunities provided by a technologically and socially modernizing world. Geopolitical globalization served to obscure the technological and social globalization that continued from its emergence in the 19th century through to the conclusion of the Cold War. However, during this time the environmental costs of pollution and resource depletion continued to accrue with both human and national security implications. The environmentalists who emerged from the 1960s and globalized from the 1990s are socially and politically distinct from many of their 19th Century forbearers but the basis of their support and impact is still quite similar: the human and national security implications of environmental degradation.

The concept of environmental security has struggled to achieve the currency it deserves in the present age given that over 8 million people a year are killed by pollution and many more are

threatened by the worsening of the current climate crisis. This has much to do with the word *security* coming to be co-opted by 20th Century militarism. Moving beyond this mindset would help properly conceptualize and politically prioritize such global problems.

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CONFLICT OF INTERESTS

In accordance with Taylor & Francis policy and my ethical obligation as a researcher, I am reporting that I am an editor on this journal. I have disclosed this fully to Taylor & Francis, and I have in place an approved plan for managing any potential conflicts arising from this involvement.