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TRACING THE ROLE OF ECOLOGY IN EMPIRE BUILDING: INSIGHTS FROM THE WORKS OF CROSBY AND OTTER

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Abstract

This article reviews two influential works in the history of food and environment: Alfred Crosby's *Ecological Imperialism* (1986) and Chris Otter's *Diet for a Large Planet* (2020). Though the books have a distinctive focus area, they share a common thread by focusing on the global shifts in ecology, food and the power dynamics attached with it. Crosby focuses on the ecological factors that enabled the Europeans to colonise the New World, and Otter focuses on the role of techno-scientific systems that created the modern high-energy diet. This review places these works in conversation with each other, and highlights their relevance in understanding ecological factors that helped European colonisation, and sheds light on new perspectives on agricultural and environmental history. This review article has three aims. First, it will examine the central arguments, contributions and limitations of each book individually. Secondly, it will bring them into a dialogue to highlight both continuities and divergences in the ways they conceptualise the relationship between food, power and environment. Third, it will reflect on how these works collectively inform current historiography, particularly in relation to agricultural transformation and environmental change in colonial contexts.

Key Words: Ecological Imperialism, Environmental History, Large Planet Philosophy, Neo-Europes, Food History.

Introduction

The historical scholarship witnessed a transition from the traditional method of writing history to a more nuanced understanding of history in the 20th century. The political history which hitherto dominated the traditional approach was found lacking in exploring the voices of the subaltern and environmental denominators. Works on ecology started to emerge as early as the 19th century. George Perkins Marsh's work, entitled *Man and Nature: Or Physical Geography as Modified by Human Action*, is considered among the foundational texts in the environment and ecological history (Marsh, 1864). Through his work, Marsh intended to show that, contrary to the popular notion that the earth made man, man, in fact, made the earth. He cautioned that if people didn't take care of natural resources and understand the impact of their actions, they could harm both themselves and the planet. His book was the pioneer work to show the impact of human activity on the environment, which initiated the conservation movement.

The emergence of the Annales School in the 20th century transformed historical writing, which had been hitherto dominated by political narrations. The scholarly works of Marc Bloch and Lucien Febvre popularised the term 'total history', which exercised the interdisciplinary approach to study the complete history of mankind that encompasses the economic, social, cultural, geographic and psychological dimensions. Fernand Braudel, who was the second-generation Annales historian, explained the historical events through the lens of an environmental and climatic perspective in his magnum opus, titled The Mediterranean and the Mediterranean World in the age of Philip II, originally published in French in 1949 and later translated into English (Braudel, 1972). The concept of longue durée emphasised that even the slow-moving structures such as climate, geography and agriculture shaped historical events. Other significant works in the field of ecological history are; Donald Worster's *Dust Bowl: The Southern Plains in the 1930s* looks at the phenomena of Dust Bowl- a natural disaster caused by drought and wind that struck the Great Plains region of the United States during the 1930s, as a man-made ecological catastrophe rooted in the economic values of American capitalism (Worster, 1979). Richard Groves *Green Imperialism,* which shows that modern environmentalism emerged not in Europe but from the colonial experiences in the colonies (Grove, 1995). In Rachel Carson's Silent Spring, the focus is directed towards the indiscriminate use of synthetic pesticides, especially DDT, which caused widespread ecological damage (Carson, 2002). The pesticides not only killed the pests rather affected the birds, fish, insects and even humans.

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J.R. McNeill's work *Something New Under the Sun: An Environmental History of the Twentieth Century World* explores how human activity, such as population growth, industrialisation and energy consumption, changed the world drastically in the 20th century (McNeill, 2000). He argues that environmental changes in this era were so drastic that they deserve the serious attention of historians as significant as the political events. In the context of India, scholars like Madhav Gadgil (Gadgil, 2001), Ramachandra Guha (Guha, 1992), Mahesh Rangarajan (Rangarajan, 2002), and Vinitha Damodaran (Damodaran, 2002) are working on various aspects of environmental history. In this historiographical backdrop of evolving environmental thought, the present paper is going to analyse the contributions of Alfred Crosby and Chris Otter in the field of environmental and ecological history. The works of Crosby and Otter offer unique insights into colonial empire building and ecology.

Ecological Imperialism: Alfred W. Crosby

The significance of ecological change in shaping historical events gained scholarly momentum with Alfred W. Crosby's seminal work *The Columbian Exchange*. In this work, Crosby examined the biological and ecological changes triggered by transatlantic trade following the voyages of Christopher Columbus (Crosby, 1972). The study focused on the transfer of plants, animals and diseases between the Old and New Worlds, highlighting the profound consequences of a specific historical moment. Crosby expanded this line of inquiry in his subsequent work *Ecological Imperialism: The Biological Expansion of Europe, 900–1900,* published by Cambridge University Press (Crosby, 1986). The book is structured in twelve chapters. In its first phase, Crosby offered a sweeping overview of the evolution of life on Earth and the history of oceanic voyages prior to the Age of Exploration. The next phase focused on European expansion into the Neo-Europe's regions, such as North America, Australia and parts of South America, where European biota flourished in climates similar to their native habitats. Crosby coined the term 'Neo-Europe's' to describe these regions, highlighting how ecological compatibility enabled successful settlement and demographic growth among Europeans, while contributing to the decline of indigenous populations.

His seminal argument in the book was that Europe's global dominance was not solely the result of military power or cultural superiority, but was deeply rooted in ecological factors. He stated that the success of European colonisation was facilitated by the introduction of Old-World biota-plants, animals, pathogens and pests that thrived in colonised lands, often at the expense of native species and populations. By emphasising ecology as a central force in imperial expansion, Crosby challenged triumphalist narratives that attributed European success to rational institutions, technological innovation or cultural superiority. His work became a cornerstone of environmental historiography and resonated strongly with the rise of environmental history as a field in the 1980s.

Crosby introduced the thesis by revisiting 'Pangaea', which was a single land mass of all of Earth's continents that existed roughly 200 million years ago. This period was dominated by dinosaurs and mammals, and the potential for species variation was minimal due to the unified landmass. He then goes on to explain how the split of Pangaea due to the movement of tectonic plates led to the geographical isolation of the land mass. This separation enabled life to develop separately, and species developed and adapted to their varied ecological conditions. Human ancestors at this period were concentrated on the Eurasian Continent. However, they eventually migrated into the previously uninhabited regions of the North and South Americas and Australia. Unlike other creatures, which had to wait for specific genetic changes to enable them to migrate into areas radically different from those of their ancestors, Homo sapiens and their hominid predecessors easily migrated and colonised the different regions because of the development of more complex and cognitively advanced brains. This cognitive leap helped them to master the use of language and the art of tool-making. Additionally, the shallow waters between the continents enabled the migration process. Through these analyses, the evolution of humans is located within the broader context of species development. The members of the human species entered Australia some 40,000 years ago and into America some 20,000 years ago. This migration, according to Crosby, marks the first wave of human occupation of the New World. Early humans hunted the giant mammoths and other species, which caused their extinction. Additionally, humans acted as carriers of invasive species such as pathogens and parasites that attacked native fauna. Around some 10,000

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years ago, the larger ice caps melted, paving the way for large oceans, thus isolating the human species, who had been in the New World and the Old World.

Crosby then shifts his focus to the ecological factors that paved the way for European expansion into the New World in the 16th century. His central thesis challenged the conventional explanations of colonial success rooted in military or political dominance, arguing instead that Europeans held a profound ecological advantage over the populations they colonised. This advantage manifested through the transfer of plants, animals and pathogens was termed by Crosby as 'ecological imperialism.' By framing colonisation as a biologically driven process, Crosby reshaped our understanding of empire towards the environmental conditions that enabled its spread.

Crosby argued that Europeans carried a suite of biological agents with them, which he termed 'portmanteau biota.' These were the collection of plants, animals, and diseases that Europeans introduced to the New World, which radically transformed the ecosystem. Crosby focused particularly on Neo-Europe's regions, such as North America, Australia, New Zealand, and parts of southern South America, where European settlers not only survived but flourished. In these places, indigenous populations were devastated by Old World diseases, while European plants and animals quickly naturalised, creating familiar ecological environments for settlers.

According to Crosby, one of the most decisive factors in enabling European colonisation was the introduction of Old-World pathogens. Diseases such as smallpox, measles and influenza decimated indigenous populations who had no prior exposure or immunity to these microbes. Crosby argued that this biological invasion was as instrumental to European dominance as military power or economic strategy. The dramatic depopulation of native communities created a vacuum that allowed Europeans to seize land, consolidate and expand their imperial reach with far less resistance.

The introduction of old-world crops such as wheat, barley and sugarcane, along with domesticated animals like horses, cattle and pigs, devastated the native agricultural systems and livestock, which were less resilient to their European counterparts and were easily replaced. This enabled the creation of agricultural systems that mirrored European landscapes and supported colonial settlements. Similarly, the introduction of weeds into the New World proved catastrophic to the native flora; they proliferated quickly in the absence of natural predators such as pests and pathogens that would have regulated their growth in the native environment. To reinforce his claims, Crosby presented several case studies:

- **The Americas**: Epidemics, combined with the spread of European crops and livestock, transformed landscapes and societies. This ecological upheaval enabled large-scale settler colonisation and the displacement of indigenous populations.
- **Australia**: The introduction of sheep not only reshaped the continent's environment through overgrazing and soil degradation, but also became central to the colony's economy. Australia earned the moniker 'the sheep's back' for its reliance on wool production, which underpinned its economic development.
- **New Zealand**: European plants and animals rapidly displaced indigenous species, altering the ecological balance. Māori communities suffered from introduced diseases and systematic land alienation, which facilitated European settler dominance and the marginalisation of native populations.

Crosby's ecological lens offered a compelling framework for understanding European expansion, yet it also had significant limitations. This paper argues that Crosby's thesis is limited by its Eurocentric approach. By framing European success primarily in terms of ecological advantage, the thesis sidelined the agency of indigenous peoples. It is also noticed that Crosby portrayed native Americans, Pacific Islanders and Aboriginal Australians largely as passive victims of disease and ecological invasion introduced by the Europeans, rather than as actors who engaged, resisted, and adapted to colonial pressures. In doing so, he risked reinforcing the narrative of inevitability in European domination. By tracing history from the breakup of Pangaea to the present day, Crosby prioritised breadth over analytical depth, resulting in a narrative that occasionally overlooked the complexities of localised historical processes. The study also argues that the Neo-Europe

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concept, while innovative, is also narrow in its geographical application. It only focuses on regions where Europeans successfully transplanted temperate ecologies, while leaving out tropical colonies such as India, West Africa and the Caribbean. In these contexts, Europeans did not reproduce their own ecosystems but adapted imperial strategies around extraction and labour exploitation.

Despite these critiques, Crosby's *Ecological Imperialism* has contributed immensely to historical scholarship. It gave legitimacy to environmental history as a field, showing that ecological and biological factors were not mere passive agencies, but active agencies in the historical processes of colonisation and empire-building. Crosby's ecological lens highlighted nonhuman actors such as microbes, plants and animals, thus challenging human-centred narratives of history. His arguments also provided a powerful framework for understanding global agricultural transformations, since many staple crops and domesticated animals were transplanted across continents during this period. It laid the groundwork for later studies of how ecological processes shaped human history and provided an interpretive model that would influence both global history and environmental history for decades to come.

Chris Otters' Diet for a Large Planet

Another monumental work that has contributed to our understanding of the influence that food has on human history is Chris Otter's *Diet for a Large Planet: Industrial Britain, Food Systems and World Ecology,* which was published by the University of Chicago Press (Otter, 2020). The book comprised nine chapters. It offered a compelling account of how Britain's industrial transformation reshaped global food systems and ecological relationships. While Crosby emphasised the fact that colonial expansion was intrinsically linked with ecological expansion, Otter looked at the metabolic and technological dimensions of empire, arguing that Britain's industrial diet, characterised by high-calorie and resource-intensive foods, required vast ecological inputs from across the globe. Otter traced how industrial Britain's appetite drove environmental change not only at home but in distant lands, through extraction, trade and ecological reordering. His work located food as a central force in the making of modernity, linking nutrition, empire and planetary systems in a tightly woven narrative. By examining the emergence of industrial food systems in England, Otter identified the altered landscapes, labour and ecological flows. This thesis made Otter a pioneering scholar in the field of food history, in particular, analysing the environmental costs of modern consumption and the global inequalities.

Otter initiated his work by challenging the conventional historiographical narratives that studied the industrialisation process. According to him, these studies focused primarily on energy (coal, steam, oil) and technology. He argued that food played a significant role in Britain's industrialisation, thus needs to be seen as part of the energy system that fuelled industrialisation. The study also highlighted that in order to understand the deeper history of today's global food situation, it is necessary to explore post-1800 Britain. He opined that Britain laid the foundations for the contemporary food systems of the world. Otter framed the work around the concept of 'nutrition transition', which he used to explain the shift from traditional, local, plant-heavy diets to energy-dense, meat and sugar-rich industrial diets.

At the outset, Otter argued that the expansion of industrialisation in Britain made the shift from traditional and often diverse food practices to energy-rich dietary practices. Prior to industrialisation, the staple diet of Britons was bread, barley, Oatmeal porridge and vegetables. However, industrialisation demanded a strong working force, which in turn gave scope for a high-energy, nutrient-rich diet. The rise of nutritional science in the 19th century looked at food from the aspects of calories, proteins and fats, etc. Diet was quantified, measured and optimised with industrial logics of efficiency. In order to explain this process, Otter emphasised primarily three food items: wheat, meat and sugar. He explained how, by the 19th century, industrialisation and population explosion meant that Britain could not sustain itself from its local food basket. It increasingly relied on agricultural imports, mainly wheat from countries such as North America, Russia and Argentina. This made bread the staple food of the working class. Moreover, Britain's vast colonial market ensured that it could draw supplies from its colonies, which increasingly functioned as a breadbasket. Otter posited that the globalisation of food production

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and outsourcing stemmed from what he described as a 'large planet philosophy'- the notion that the entire globe could be harnessed as a reservoir of material resources and sites for capital investment.

The thesis then explained how sugar, which was considered a diet only for the elites, had started to become increasingly accessible to the common folk. The Caribbean sugar plantations, which were built on slavery and indentured labour, contributed to a reduction in prices and increased availability. Soon Britain's market was flooded with cheap sugar. This became an everyday calorie source and contributed to the increased consumption of tea, coffee and cocoa, which helped sustain long working hours. Processed food also started to flood the market. The study then shifted its focus towards meat. Until the 19th century, meat was a luxury food for the Britons. However, vast-scale meat imports enabled by refrigerated shipping in the late 19th century revolutionised dietary practices. Now, fresh meat could travel all across the oceans without spoiling, thus linking Argentine ranches and New Zealand sheep farms. Meat brought in a cultural shift among Britons, and came to symbolise prosperity, strength and modernity. The thesis then turned its attention from describing the transformation of Britain's diet to analysing its ecological impact. Otter stated that Britain's diet was not sustainable; it depended on controlling and reconfiguring the landscapes abroad. Colonies like India were reoriented to produce crops needed by the British markets. Britain's continuous import of grains from North America, Russia and India depleted the soil and undermined the local subsistence farming of the natives. The industrial food also brought in a spectrum of diseases such as rising rates of obesity, diabetes and cardiovascular diseases.

This paper contends that a significant shortcoming in Otter's analysis lies in his insufficient attention given to the pivotal role of slavery in shaping global capitalism. Furthermore, while Otter referred to the Irish and Bengal famines, his discussion falls short of critically examining the political economy surrounding food exports during these events. Also, Otter's focus was heavily centred on Britain and the West, and offered limited engagement with the Global South. Despite these shortcomings, the contribution of the thesis to the history of agricultural practices and food production is vital. Otter connected the food history with the history of science and technology, offering tools for historians concerned with agricultural transformation in both historical and contemporary contexts.

Conclusion

When examined collectively, Alfred W. Crosby's *Ecological Imperialism* and Chris Otter's *Diet for a Large Planet* offer two distinct yet complementary frameworks for understanding the entangled histories of empire, ecology and consumption. Crosby's work foregrounded the biological dimensions of colonial expansion, arguing that European success in Neo-European colonies was largely due to the ecological compatibility of imported species and the devastating impact of pathogens on the New World. While Crosby's work has been highly influential, it leans towards environmental determinism, a perspective that risk minimising human agency and oversimplifying the complex socio-political dynamics underpinning imperialism.

Otter, by contrast, shifted the focus from biological expansion to dietary transformation, emphasising how Britain's industrial and imperial ambitions reshaped global food systems. His analysis of the rise of the Western diet reflected the increased consumption of meat, wheat, and sugar. This revealed how technological innovation and imperial extraction were combined to produce a model of consumption that remains ecologically unsustainable and socially unequal. Otter's interdisciplinary approach, blending environmental history with political economy and biopolitics, offered a more nuanced account of how food became a tool of empire and a driver of planetary change.

Both authors underscored the profound ecological consequences of European expansion, but they differ in emphasis. Crosby focused on the unintended biological consequences of colonisation, while Otter highlighted the deliberate construction of global food chains and the ideological underpinnings of dietary imperialism. Together, these works challenged the existing historiography to reconsider the origins of modern ecological crises not as isolated events, but as legacies of imperial systems that reconfigured landscapes, bodies and economies. They highlighted that the history of food and ecology is

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inseparable from the history of power and authority, emphasising that any meaningful pursuit of sustainability must confront the ecological and moral inheritances of colonialism.

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