Frank Uekötter (ed.)

Comparing Apples, Oranges, and Cotton

Environmental Histories of the Global Plantation

campus

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Campus Verlag
Frankfurt/New York

Distribution throughout the world except Germany, Austria and Switzerland by

The University of Chicago Press
1427 East 60th Street
Chicago, IL 60637

Published with support from the VolkswagenStiftung
and the Rachel Carson Center for Environment and Society.

Rachel Carson Center
Environment and Society

Bibliographic Information published by the Deutsche Nationalbibliothek.
The Deutsche Nationalbibliothek lists this publication in the Deutsche Nationalbibliografie; detailed bibliographic data are available in the Internet at http://dnb.d-nb.de
ISBN 978-3-593-50028-7

Cover design: Campus Verlag GmbH, Frankfurt-on-Main
Cover illustration: Application of pesticides on a pineapple plantation © Deutsches Museum, Munich
Typesetting: Campus Verlag GmbH, Frankfurt-on-Main
Printing office and bookbinder: Beltz Bad Langensalza GmbH
Printed on acid free paper.
Printed in Germany

This book is also available as an E-Book.

For further information:
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www.press.uchicago.edu

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Rise, Fall, and Permanence. Issues in the Environmental History of the Global Plantation

Frank Uekötter

Orange juice has long emerged as a staple in the American diet. It receives almost universal acclaim for its fresh taste and its health benefits, with consumption reaching across divisions of class, race, region, and gender. Florida has dominated production ever since orange growers discovered juice as an outlet for surplus production in the early twentieth century. The state of Florida established a Department of Citrus in 1935. The industry took off after the patenting of a method to produce frozen concentrated orange juice in 1948, and corporate America entered the ring: Coca-Cola bought the Minute Maid brand in 1960 while Pepsi acquired Tropicana in 1998. The Florida legislature declared orange juice the official state beverage in 1967.[1]

It may soon be over. A disease called citrus greening is wreacking havoc to an ever growing number of orange groves all over the peninsula. Caused by a bacterium, it spread through the Asian citrus psyllid, an invasive species that was first found in Florida in 1998. Citrus greening makes trees loose foliage and causes fruit to turn bitter and drop from trees before they are ripe, effectively rendering orange trees unproductive. No known cure exists for the disease, and attempts to curb the bug's spread have met with mixed success at best. The epidemic follows on the heels of a canker epidemic that cut Florida citrus production by roughly one third. After a campaign that cost $ 600 million and included felling 12.7 million citrus trees (about ten percent of Florida's commercial acreage), the U.S. Department of Agriculture found that the fight against canker was lost and cancelled its eradication efforts in 2006. In short, a tiny insect is currently pushing a nine billion dollar industry into oblivion.[2]

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1 Alissa Hamilton, *Squeezed. What You Don't Know About Orange Juice* (New Haven and London: Yale University Press, 2009); http://www.flheritage.com/facts/symbols/symbol.cfm?id=14 (retrieved May 27, 2013).

2 Susan E. Halbert, Keremane L. Manjunath, "Asian Citrus Psyllids (Sternorrhyncha: Psyllidae) and Greening Disease of Citrus: A Literature Review and Assessment of Risk in

The story of citrus greening mirrors the paradox of the modern plantation: the combination of permanence and notorious instability. In essence, plantation history offers a deeply ambiguous narrative—a global success story full of crushing defeats. On the one hand, plantations are a cornerstone of global food production in the modern era. They have supplied societies all over the world with a cornucopia of cheap products and will continue to do so for the foreseeable future. Western consumers can barely imagine a life without oranges, apples, coffee and other plantation products, and for good reasons: they never had to worry about them throughout their entire lives. On the other hand, plantations are constantly under threat, and many plantation systems go through cycles of boom and bust. A whole host of factors can jeopardize or terminate a plantation project, and no one knows in advance whether things will work out.

Of course, the environment was not the only source of trouble for plantation systems. Labor was a key issue, particularly since plantation economies hinged on slavery into the nineteenth century. The sugar industry in Brazil and the Caribbean, arguably the archetype of the modern plantation, is the best-known example.[3] Competition is another factor. Florida's citrus industry is not only under siege from nasty diseases but also from real estate developers and cheaper producers abroad: Brazil passed Florida as the world's leading producer of oranges some three decades ago.[4] However, environmental problems have galvanized attention long before environmentalism became a global force towards the end of the twentieth century. Soil fertility and erosion were subject to intensive debates. Pests and diseases inspired fears and frantic eradication efforts. They also inspired popular culture: the boll weevil—another tiny insect that ate its way through the Cotton South around 1900—left a mark not only on U.S. plantations but also in blues music.[5]

Florida," *Florida Entomologist* 87 (2004): 330–353; Erik Stokstad, "New Disease Endangers Florida's Already-Suffering Citrus Trees," *Science* 312 (2006): 523–524.

3 Sidney W. Mintz, *Sweetness and Power: The Place of Sugar in Modern History* (New York: Viking, 1985); Philip D. Curtin, *The Rise and Fall of the Plantation Complex. Essays in Atlantic History* (2nd edition, Cambridge: Cambridge University Press, 2002).

4 Hamilton, *Squeezed*, 213.

5 James C. Giesen, *Boll Weevil Blues. Cotton, Myth, and Power in the American South* (Chicago and London: University of Chicago Press, 2011), 95.

Scholarly Traditions

Historians have discussed the role of environmental factors in plantation history long before the rise of environmental history as a distinct scholarly field in the 1970s and 1980s. In U.S. history, the boll weevil routinely figured as the nemesis of the Old South and the main culprit for the problems of the rural South in the first half of the twentieth century, thus distracting attention from other issues such as land ownership patterns or white supremacy.[6] The Royal Botanic Gardens at Kew take pride in their role in the transfer of rubber seeds from Brazil to Southeast Asia, where plantations soon outcompeted rubber tapping in the Amazon rain forest.[7] In 1926, Avery Craven published a book with the speaking title *Soil Exhaustion as a Factor in the Agricultural History of Virginia and Maryland, 1606–1860*.[8]

It attests to the Eurocentrism of historical scholarship that these early publications did not inspire a self-conscious field of study, and this volume bears the mark of a scholarly tradition that sees Europe's role in plantation history as primarily that of a consumer. In spite of the editor's best efforts, this volume does not include an article on a plantation in Europe. That is certainly not due to a lack of suitable topics. Huge orchards produce European apples and oranges, vineyards bear the hallmarks of a plantation down to a devastating phylloxera epidemic in the late nineteenth century, and a single Bavarian region, the Hallertau, grows a quarter of the global supply of hop.[9] However, most Europeans think of plantations as an entity "somewhere else", an understanding that is perfectly in line with the word's origin. Mart Stewart's article reminds us that the plantation entered the English vocabulary with the sixteenth-century conquest of Ireland, designating what one would nowadays call settler colonization.

Looking into the environmental dimension of plantations thus follows a scholar tradition, but it is a tradition that is diverse, scattered, and widely unexplored.[10] It is also an ambiguous legacy for the discipline of environmental

6 Giesen, *Boll Weevil Blues,* xii.

7 Ray Desmond, *The History of the Royal Botanic Gardens, Kew* (2nd edition, Kew: Kew Publishing, 2007), 231–3.

8 Avery Odelle Craven, *Soil Exhaustion as a Factor in the Agricultural History of Virginia and Maryland, 1606–1860* (Urbana: University of Illinois, 1926. Reprints 1965 and 2006).

9 Christoph Pinzl, *Die Hopfenregion. Hopfenanbau in der Hallertau—Eine Kulturgeschichte* (Wolnzach: Deutsches Hopfenmuseum, 2002), 8.

10 Scholars of historiography have mostly ignored this tradition, leaving the door wide open for a study on what one might call "environmental history before environmental history".

history. On the one hand, it shows that environmental history is more than a scholarly reflection of late twentieth century sentiments: today's researchers continue a discussion that earlier scholars have long recognized as crucial. On the other hand, authors had narrowly focused on the environment as an *impediment* to plantations whereas recent scholarship views the environment more broadly as a multifaceted *context*. Furthermore, preexisting readings proved a burden as much as an encouragement. German forestry, perhaps the world's first monoculture science, produced not only coniferous plantations but also an authoritative narrative about the foresters' profession saving the country from a devastating scarcity of wood—a myth that forest historians have taken pains to dismantle.[11] In his award-winning *Mockingbird Song*, Jack Temple Kirby makes short shrift of Craven's thesis, asserting that "now, however, one must doubt that the Chesapeake country was ever lost or needed saving."[12]

Plantations are a truly global phenomenon during the modern era, but they are far from uniform. In common parlance apples and oranges make for a difficult comparison, and yet they are similar in that they are both fruit, which is not always the case for plantation commodities. Cotton is a fiber that grows around the seeds of cotton plants; rubber comes from a milky substance that *hevea brasiliensis* trees give off from incisions in their bark. Even for the same commodity, methods of production differ from region to region, and local variation exists as well; the diversity of Mother Nature dictates that there are probably no two plantations in the world that are truly identical. Scholarship has generally taken this diversity as a given. Most studies focus on a single commodity in a specific region, and many authors go to great lengths in highlighting regional and national specifics. Rarely do we find books and studies that look at more than one geographic area.

Of course, the world is a complicated place, and differentiation and academic specialization have their merits. But maybe it is time to view the plantation more comprehensively: as a global endeavor that is a key feature of modern history? Instead of leaving things at an endless variety of plantation systems, this volume proposes to see them as a transnational phenomenon that one might call the global plantation. Conditions on the ground may differ, but looking across the range of plantation systems around the globe, there are a number of things that ring familiar. In short, the global plantation

11 Cf. Joachim Radkau, *Wood. A History* (Malden, Mass.: Polity Press, 2012).

12 Jack Temple Kirby, *Mockingbird Song. Ecological Landscapes of the South* (Chapel Hill: University of North Carolina Press, 2006), 89.

is not a Weberian ideal type or an illusionary "average plantation". It is an intellectual construct that serves as a vehicle for a discussion of the common challenges for plantation systems worldwide.

It is rewarding to aim for such a problem-oriented synthesis with a discussion of environmental challenges. Unlike many other sub-disciplines, environmental history has one great potential in a global context: it holds the promise of making global history more simple.[13] Labor systems and land ownership patterns can differ endlessly around the world, but when it comes to ecological challenges, the laws of nature make for a notable degree of uniformity. Every irrigation system is coping with the threat of salinity. Pests and fungi kill plants regardless of national cultures. And when soils are exhausted from monocultures, the owner is in trouble irrespective of whether he is a plantation lord, a sharecropper, or a free peasant. (And neither does it matter if "he" is really a "she".[14]) To be sure, responses may differ depending on the socioeconomic context. For instance, planters can buy fertilizer or enlist scientific expertise that sharecroppers cannot afford. And yet the similarity of ecological challenges makes for a common thread that runs through the global history of plantations, and it seems worthwhile to explore the analytical potential of this thread. That is what this volume intends to do.

The essays in this volume are case studies on specific commodities in certain regions. But at the same time, they hold broader relevance in that they discuss issues that resonate in plantation systems all over the world. As some of these issues are discussed implicitly, this introduction seeks to identify these recurring themes and reflects on the more general implications of the case studies. It does so in a tentative fashion: the goal is to highlight perspectives for ongoing research, and to offer some ideas as to their scholarly potential. The aim is to open doors and to reflect on the challenges that students of plantations all over the world might want to explore more closely.

These perspectives are diverse and go in different directions. Here the complexity of the global plantation meets with the inherent diffuseness of environmental history. Disciplinary boundaries are never clear-cut, but those

13 Cf. Frank Uekötter, "Globalizing Environmental History—Again," in *The Future of Environmental History. Needs and Opportunities*, eds. Kimberly Coulter, Christof Mauch (RCC Perspectives 3 [2011]), 24–26.

14 Unfortunately, gender is not discussed in this collection to the extent that one would wish. Christiane Berth mentions women who came to Guatemalan plantations to join their male companions (and sometimes left after they found that it was not a good place to be), but it seems that they did not shape views about the environment to a significant extent.

of environmental history are, as John McNeill noted in a landmark article, "especially fuzzy and porous."[15] What environmental history can offer to plantation history is a multitude of hints and perspectives with varying degrees of significance and subversive power. With that, this volume is better in destabilizing established readings than in offering a new master narrative, but that arguably fits the subject. When it comes to plantations, ecological stability is as elusive as interpretative certainty. Plantations have many ways to make people 'in the know' look foolish.

While pushing conceptual and methodological limits, the following articles are also amenable to a more conventional reading. Authors were asked to write for the uninitiated and explain fundamentals of their respective plantation system, and editing sought to exorcise traces of insider code that hinders understanding beyond the circle of specialists. That makes this volume a primer for commodities in specific regions, some well-known and others less so. To be sure, the essays assembled herein make no pretense at comprehensiveness: the modern world of plantations is too wide for any such claim. But beyond their specific topics, these articles provide an idea of the richness of the overall field, and perhaps alert scholars in search of rewarding topics to a field wide open for new endeavors.

The Combination Lock: Understanding the Plantation

As we have seen, the word plantation grew out of a brutal expansionist context. It did not get much better after that. Slavery stained the image of plantations ever since the rise of the abolitionist movement, and we continue to associate the word with harsh labor, social inequality, export dependency, and monoculture. For affluent Westernites, plantations are far away, be it geographically or chronologically. Few Central European foresters appreciate it if you call their carefully managed woodlands a coniferous plantation.

From an environmental standpoint, these trepidations are revealing only in respect to prevailing mindsets. Self-definitions rarely work in a global context, and when it comes to plantations, the Eurocentric bias of popular understandings is plain. Therefore, this volume departs from what one might

15 John R. McNeill, "Observations on the Nature and Culture of Environmental History," *History and Theory* 42 (2003): 9.

call an ecological definition: plantations are first and foremost about a certain way of producing organic resources. More specifically, plantations are large, profit-driven plant production complexes that focus primarily on one commodity and cater to distant markets. With that, plantations are not necessarily about food: with rubber and cotton, this volume includes two non-food commodities. Plantations are also not necessarily about agriculture; indeed an article about commercial forests is part of this collection. In fact, forestry provides a showcase for the biological arbitrariness of Eurocentric plantation wisdom. We routinely talk about plantations when people milk latex from *hevea brasiliensis* trees, but when we talk about another tree species, and if we fell the trees rather than incise their bark, we somehow think that this is something completely different.

We will see the merits of this inclusive definition in the following, as forestry provides some of the best illustrations for the plantations' environmental intricacies. Furthermore, a broad definition frees us from the obligation to make intellectual investments in boundary work, as ways of *defining* the plantation are ultimately less rewarding in scholarly terms than ways of *understanding* the plantation. In his discussion of Liberian coffee, Stuart McCook suggests a metaphor that is worth exploring: a plantation is like a combination lock in that one false number ruins the entire enterprise. In his view,

> "the success of a commodity is determined by a set of contingent and changing problems and opportunities, each of which is like a tumbler in a lock. To open the lock, it is necessary to successfully pick a whole set of tumblers; if even one of the tumblers is not picked, the lock does not open. For any given commodity, the tumblers in this lock involve complex combinations of environmental, economic, scientific, social, cultural and other factors".[16]

According to McCook, Liberian coffee looked like a winning combination in the late nineteenth century. However, some tumblers ultimately refused to fall into line, leading to the failure of Liberian coffee as a global commodity.

It is tempting to push this metaphor further. Not all locks work perfectly: they are rusty, worn out, or in need of oiling. Similarly, plantations rarely operate smoothly, and somebody (or something) usually pays a price when the going gets tough. In fact, it is hard to say whether a plantation system is collapsing or simply facing some trouble, just as a badly damaged lock may stay in use for some time. Locks are delicate devices where repairs may cause

16 McCook, in this volume, p. 87.

performance to deteriorate, just as fixing a plantation may backfire. Plantation managers strive to achieve optimum performance in perpetuity, which is similar to owning a master key that opens every door. And then there is the mysterious attraction of locks that made them a fixture in popular culture: plantations likewise have a fascination that goes beyond the purely functional. After all, there are usually alternatives to plant production in the plantation mode, and some plantations persist in spite of the fact that their productivity is inferior to other modes of production. For example, Indonesian rubber plantations were never able to compete with smallholders throughout the entire twentieth century.[17]

Those with a theoretical bent may sense a whiff of Luhmannian sociology behind the metaphor of the lock. As one of the leading proponents of systems theory, Niklas Luhmann described modern society as a delicate set of subsystems: politics, business, academia, etc. Luhmann's key argument was that each of these subsystems was cognitively and operationally closed: all subsystems have distinct binary codes that guide their routine work. Subsystems were inherently unable to understand the code of another subsystem, ruling out targeted communication. With a view to the lock metaphor, the autonomy of different spheres rings familiar. Plantations will encounter problems in very different realms, and each of them is crucial: it is impossible to compensate for problems in the environmental realm through swift performance in the economic or political sphere, no more than one subsystem may do the job of another in Luhmannian systems theory. For modern society to work, Luhmann required all subsystems to operate smoothly, just as all tumblers in a lock need to align.[18]

In other words, plantations face environmental challenges in many different respects. Challenges may correlate, but each of them has its distinct rationale and calls for specific solutions. For example, the growth of scientific institutions may increase the problem solving capacity of a plantation system, but research may be clueless in the face of hazards such as canker and citrus greening in Florida or Panama disease for bananas. With that, there is no hierarchy in the issues that the remainder of this introduction will discuss. It completely depends on the specifics of the individual plantation

17 Michael R. Dove, *The Banana Tree at the Gate. A History of Marginal Peoples and Global Markets in Borneo* (New Haven and London: Yale University Press, 2011), 6.

18 For more information on Luhmann, see Hans-Georg Moeller, *Luhmann Explained. From Souls to Systems* (Chicago: Open Court, 2006); and Balázs Brunczel, *Disillusioning Modernity. Niklas Luhmann's Social and Political Theory* (Frankfurt: Lang, 2010).

system whether a challenge is important, critical, or irrelevant. The one thing that we can generally say is that it may be a good idea for scholars to play them through—just as people like to play with a combination lock.

Imagining the Plantation, Imagining Society

In the beginning, agriculture was simply imitation of nature. People observed the growth of grain and the movement of animals in the wild and worked from there. Plantations are too complicated for such an approach. They are complex arrangements of land and labor, climate and crops, transport and terrain that have no equivalent in nature. As a result, plantations need some kind of guiding idea, a blueprint that lays out how things should come together. Of course, this blueprint needs to allow flexible solutions on the ground, and it can have widely differing levels of refinement, but improvisation alone is an insufficient guide for management. As part of this blueprint, every plantation system produces a specific environmental imagination.

Mart Stewart's article shows the implications for the plantation societies of the U.S. South. The environmental imagination did not develop in a vacuum: it became enmeshed with ideas about social and racial hierarchies. Stewart notes that different groups have different imaginaries. There was an environmental ethos of plantation owners and managers, and another one of the slaves and the post-slavery working population. Of course, these imaginaries were closely intertwined in agricultural practice, but they were distinct intellectual universes with different goals and practices that scholars need to understand in their causes and consequences.

Stewart stresses the conceptual challenges that the merger of ideas about the environment and ideas about society implies. Reading debates among planters and slaves as antecedents of today's soil conservation initiatives and environmental justice movements robs them of context: there is no way to separate green paternalism into a racist and an ecological mindset. "The improvement of soils, the improved management of slaves, the strengthening of Southern institutions and the Southern economy—all were related and reciprocal, an organic whole, a genuine ethos", Stewart notes.[19] Slaves and

19 Stewart, in this volume, p. 39.

slave owners had environmental commitments, but it is difficult to find a language that does justice to them.

Interestingly, plantations do not need to be successful to capture the imagination. As Chris Shepherd and Andrew McWilliam show, the plantation economy of Portuguese Timor was constantly changing. Authorities tried numerous types of organization, from communal plantations and indigenous chiefs as plantation managers to penal colonies with forced prison labor, and a broad range of commodities including coffee, coconut, rubber, and tea. The one constant was the disdain for swidden agriculture and the firm belief in the inherent superiority of plantation-style production, no matter what exactly it was about. Burning forests for plantation purposes was never a problem, but not so for indigenous subsistence needs.

Ideas about society and the environment converge in the trope of "civilization", as Christiane Berth shows in her discussion of Guatemalan coffee plantations. German immigrants saw the creation of coffee plantations in the second half of the nineteenth century as a "civilizing mission" that pertained to both humans and nature. As befits Germans abroad, order was a key theme: against the chaotic backdrop of a tropical jungle, the orderly rows of plantation trees represented the ultimate victory of the human will. Of course, Western supremacy was a relative thing on the ground: Berth notes the "Tropenkoller" or tropical neurasthenia that befell Westerners in Guatemala. Revealingly, tropical neurasthenia became a respected disease, as everything else would have been tantamount to surrender to the environment. In societal as well as environmental respects, plantation narratives tend to be master narratives (with "master" being a noun as well as the customary adjective).

In short, coming to terms with the ecological imagination of the plantation is an enduring challenge, as scholars are wrestling not only with conflicting moral judgments but also with a lack of words. The one thing that we can clearly state is that environmental historians should be wary of naturalizations. Southerners sought to naturalize their plantations as the best, if not the only possible unit of production, thus giving slavery an air of inevitability. Against this background, environmental historians should probably stress plantations as eminently unnatural places of production. Jó Klanovicz makes this point most forcefully in his discussion of apple orchards in Southern Brazil. As such, the region was inhospitable to the fruit, but driven by the demands of consumers and the imperatives of import substitution, Fraiburgo became a city of apples.

Momentum and Makeshifts

Stewart's article, along with others in this volume, shows the extent to which plantations depended on the manipulation of the environment. Rice, for instance, needed well-engineered landscapes of canals and drains to maintain the right water level. It took hard work by slaves to create these infrastructures, but once in place, they implied momentum: the economics of rice cultivation hinged on whether long-term use justified the investment. Technological momentum was present on modern plantations from the very beginning, as the expensive mills at the heart of sugar plantations serve to attest. McCook mentions the investments for processing Liberian coffee, and Jeannie Whayne notes that it took enormous outlays of capital (including money from the federal government) to maintain Memphis as a cotton hub.

For students of large technological systems, momentum has been a loaded word ever since Thomas Hughes invoked it in his landmark study of electrification in Western societies. Hughes defined momentum as analogous to physics: "The systematic interaction of men, ideas, and institutions, both technical and nontechnical, led to the development of a [sociotechnical] supersystem […] with mass movement and direction."[20] However, scholars subsequently stressed the tautology of his definition: the permanence of sociotechnical interaction leads to momentum, and momentum leads to permanence. With that, invoking momentum as an explanation is deceiving. McCook mentions that most Liberian coffee producers shunned the wet method of coffee processing in favor of a less-expensive dry method, which resulted in an inferior taste. Maybe the wet method would have delivered not just better coffee but also technological momentum. Or maybe it would have made Liberian coffee an even worse investment. In short, momentum is dangerously close to a simplistic retrospective designation of "success".

In addition to its tautological core, Hughes' concept of momentum has drawn criticism for nourishing a sense that technology drives history. Hughes was aware of this problem, positioning his concept of technological momentum "somewhere between the poles of technical determinism and social constructivism."[21] However, the momentum of plantation systems was

20 Thomas P. Hughes, *Networks of Power. Electrification in Western Society, 1880–1930* (Baltimore and London: Johns Hopkins University Press, 1983), 140.

21 Thomas P. Hughes, "Technological Momentum," in *Does Technology Drive History? The Dilemma of Technological Determinism*, eds. Merritt Roe Smith, Leo Marx (Cambridge, Mass.: MIT Press, 1994), 112.

not just a matter of technology: it was the interaction of technology, society, and the environment that made plantation systems so resilient to change. In fact, by bringing the environment more strongly into our narratives, we can grasp the true force of the imprint of plantations upon modern societies. By conditioning nature as well as society, plantations are akin to totalitarian systems—matters of life and death for entire economies and regions.

In short, the value of the concept lies mostly in the *consequences* of momentum. The combination of technological, social and environmental factors gives plantation systems an enormous potential to overcome and break resistance. We can barely account for the constant makeshifts and the enormous indifference to environmental damages and other problems without a term that highlights the inherent dynamic of a fully evolved plantation system. Plantations have a tendency to push for permanence *at all costs*, even if that implies the creation of a militarized state such as the one that Shepherd and McWilliam describe for Portuguese Timor.

If we acknowledge the momentum of plantation systems, we can better understand the hunting, fishing and gardening practices that Southern slaves maintained to feed themselves. They were improvisations under a hegemonic system, makeshifts that assured a survival that the hegemonic system did not guarantee by itself. Environmental historians have plenty of experience in highlighting hidden costs, and the articles in this book show that these costs had numerous dimensions and that these dimensions were closely linked. There was only a fine line, if any, between violence *in* nature and violence *against* nature.

The Biological Unification of the World

Diseases are perhaps the most obvious environmental challenge for plantation systems. First discovered in Ceylon and southern India in 1869, coffee leaf rust ravaged Asian plantations in the late nineteenth century and eventually emerged as a truly global plague when it crossed the Atlantic in the 1960s.[22] The Sigatoka fungus wiped out the small banana producers in Honduras while another fungus doomed Henry Ford's rubber plantation project

22 Stuart McCook, "Global Rust Belt: *Hemileia vastatrix* and the Ecological Integration of World Coffee Production since 1850," *Journal of Global History* 1 (2006): 177–195; 178.

in the Amazon rain forest.[23] The devastation brought by the boll weevil and citrus greening have already been mentioned.

The global exchange of species and pathogens is familiar terrain for environmental historians. In 1972, Alfred Crosby published *The Columbian Exchange*, a title that became the emblematic term for biological transfers across the Atlantic after 1492, and Emmanuel Le Roy Ladurie proposed his argument of a microbial unification of the world between the fourteenth and seventeenth century in 1973.[24] Since these landmark publications, a burgeoning literature has been discussing the exchange of biological material around the globe and the moral stakes involved; with disputes over "biopiracy" and "patents on life" and negotiations pursuant to the UN Convention on Biological Diversity of 1992, the worldwide transfer of plants has become a hotbed of global politics. Recent experiences with swine flue, HIV or Ebola would seem to make the case for the globalization of pathogens even stronger. However, this volume suggests a few caveats: in spite of centuries of trade and biological exchange, we still do not have a situation that one could describe as a uniform global contamination.

Contamination makes headlines, but for environmental historians, the absence of contamination is no less exciting. Berth notes the relatively benign situation in Guatemala: coffee plantations were wrestling with a number of fungal diseases, but they did not face the devastating coffee leaf rust until the 1970s. Can we provide a better explanation for these situations than sheer luck? The cognitive status of diseases is also more slippery than one would initially assume. As McCook notes, the resistance of Liberian coffee to leaf rust was ambiguous: trees fell ill, but they still produced large quantities of cherries. Liberian coffee plants were also highly variable in their disease profile. In the case of Portuguese Timor, it must remain an open question whether leaf rust was really absent or not recognized as such. Even when we accept the thesis that the microbial unification of the world will eventually take place, the effects could vary enormously. Michael Roche notes that sirex, a minor pest in Great Britain, became a huge threat in New Zea-

23 John Soluri, *Banana Cultures. Agriculture, Consumption, and Environmental Change in Honduras and the United States* (Austin: University of Texas Press, 2005); Greg Grandin, *Fordlandia. The Rise and Fall of Henry Ford's Forgotten Jungle City* (New York: Picador, 2009).

24 Alfred W. Crosby, *The Columbian Exchange. Biological and Cultural Consequences of 1492* (Westport: Greenwood Publishing, 1972); Emmanuel Le Roy Ladurie, «Un Concept: L'Unification Microbienne du Monde (XIVe–XVIIe Siècles)," *Schweizerische Zeitschrift für Geschichte* 23 (1973): 627–696.

land as it attacked the stands of *pinus radiata* that were the backbone of the country's plantation forestry. In short, the International of plant diseases is somewhat reminiscent of the Socialist International: there is an abundance of international links, but at the end of the day, the issues that count are first and foremost local.

The worldwide spread of diseases coevolved with the globalization of cures. For example, pesticides went global with amazing speed—and, as Klanovicz shows, so did the controversy over their use. And yet there was no miracle cure: keeping infections at bay was a perennial fight, one of a number of seemingly petty struggles with huge implications that characterized life on the plantation. As John Soluri remarked on banana plantations in Honduras, "Viewed from the ground level, export banana production appeared more like a series of improvisations (both creative and destructive in nature) than a well-scripted global power play."[25]

Precious Space

When it comes to plantations, the value of space is a relative thing. France famously gave up Canada in the 1763 Treaty of Paris in order to regain British-occupied Guadeloupe and Martinique: after all, the sugar plantations of the West Indies looked far more attractive from a mercantilist perspective than a cold and barren wasteland. As such, the plantation was a space-saving invention, as it maximized production on a given plot of land. However, that did not preclude a plethora of conflicts. Even in sparsely populated New Zealand, plantation forestry was competing with other types of land use.

Of course, environmental historians can claim no exclusive property to the spatial dimension of plantations, but they can add a few significant insights. Shepherd and McWilliam describe how authorities dealt with precious space through a hierarchy of resources: there were rich and poor products, and authorities urged their subjects to plant accordingly. Portuguese Timor is also a place where the Western idea of space clashed with indigenous notions: the concept of *lulik* implied that planting required spiritual consent in certain places, including places that colonial authorities saw as prime agricultural land. Scholars are also reminded that plantations are not

25 Soluri, *Banana Cultures*, 217.

strictly monocultural. Berth notes that Guatemalan coffee plantations routinely included shade trees, fields for the production of basic foodstuff, and a land reserve where cultivation would start when commodity prices rose. On São Tomé, twentieth-century cocoa plantations were also home to a variety of secondary cash crops and food for sustenance and livestock. The island is also a good showcase for the symbolic value of land ownership, as it lifted the happy owner above the strata of plantation workers.

The spatial dimension of plantation complexes was usually at odds with the spatial outreach of nation-states, and that created tensions in several dimensions. As Marina Padrão Temudo shows, the tiny sugar islands of São Tomé and Príncipe offered enough space for flourishing maroon communities until the colonial government extended its sphere of influence across the entire island. Guatemala saw a different type of conflict when Germans produced one-third of the country's coffee and even claimed a sixty percent share in some areas. The power structures of plantations coexist uneasily next to those of the nation-state: French officials in Indochina likewise expressed concern about rubber plantations being beyond their control, and scholars have called plantations on São Tomé and Príncipe "independent fiefdoms".[26] Even militarized regimes were unable to create a uniform presence. As Shepherd and McWilliam show, colonial rule in Portuguese Timor hinged on the oppressors' ability to 'divide and cultivate', that is, divide people in order to make them cultivate crops for the state.

Plantation Minds

One of the most amazing things about plantations is the ecological innocence of their makers. More precisely, ecological innocence prevailed in the early stages of plantation development and typically receded as people gathered experience. In Portuguese Timor and many other places, colonial authorities were firmly convinced that plantations were inherently superior and that they could work everywhere. In Guatemala, Germans dreaming about Rhine landscapes built coffee plantations, and their success surely owed less to their environmental sensitivity than to their fortune of having chosen a relatively hassle-free disease environment. In New Zealand, foresters im-

26 Pablo Eyzaguirre, cited by Temudo, in this volume, p. 244.

ported the European wood scarcity trope in spite of stark differences in landscapes and demand. A generation later, New Zealand authorities were aghast when they realized that they were lacking legal authority to control the importation of pathogens. As the present author has argued elsewhere, "In the beginning, and *only* in the beginning, intensive agriculture looks amazingly simple."[27]

Learning by doing was the dominant mode of intellectual advancement, only gradually supplemented by scientific expertise. Stewart shows that the South's conservation ethic (if we accept the word for once) grew in the fields at the hand of practitioners rather than in academic institutions or laboratories. This is not just a symptom of institutional underdevelopment: in spite of having one of the earliest and most efficient networks of agricultural expertise, Germany did not have a research station for hop until a fungal epidemic struck the Hallertau in the 1920s.[28] When it comes to plantations, academic freedom was an inopportune concept: science was a service provider. As Michitake Aso shows, even ecology, which holds the potential of being a "subversive" science, became a control-oriented science in the Southeast Asian context, with control serving the overarching goal of boosting production. Aso's essay also shows the highly uneven encroachment of science onto the plantation. While experts kept a close watch on pests, they played a marginal role in how to deal with weeds, where esthetics drove the planters' preferences: academic credentials ultimately yielded to the visual morality of a neat, orderly appearance. In the initial stages of plantation development, forest clearing drew heavily on indigenous swidden practices, which stands strangely disconnected from their otherwise disparaging view of indigenous farming. In Aso's reading, the plantation made ecology, not the other way round.

Going through the following papers, it is striking to note the absence of powerful professions. Even Roche uses the term cautiously in his discussion of New Zealand forestry, as he sketches a process of gradual emancipation from European and North American models. The creation of a forestry profession was a key tool for controlling careers and mindsets in Europe, but it hinged on a number of requirements that were otherwise rare in the world of plantations: state ownership of forests, a reform ethos within the administration, rigid, quasi-military discipline, the intellectual and monetary in-

27 Frank Uekötter, "The Magic of One. Reflections on the Pathologies of Monoculture," *RCC Perspectives* 2 (2011): 11.

28 Pinzl, *Die Hopfenregion*, 166.

dependence that European statehood implied, and decreasing pressure on wood resources. It is often forgotten that in spite of its penchant for "sustainability", the German forestry profession did not prevent the country from becoming a net importer of wood.[29]

In fact, the scientists in this volume are not only a diverse bunch when it comes to their academic backgrounds but also geographically disperse. Knowledge and experts crossed national boundaries with amazing ease. It is probably no surprise that New Zealand's foresters obtained their training in Europe and North America. But who would have guessed that Brazil's apples owe their existence to people from Algeria, Israel, and Japan? In Southeast Asia, British and French scientists simultaneously cooperated and competed with each other.

Hubs and Consumers

Environmental narratives tend to center on the place of plant growth, but they can also inform our thinking about events elsewhere. Some two decades ago, William Cronon showed how an ecological perspective sheds new light on the history of Chicago and the Great West.[30] Whayne follows on his heels in analyzing the evolution of Memphis as a cotton hub. Its pivotal role seemed predestined at an early stage of urban development, as it quickly outgrew the competing city of Randolph, Tennessee. The truly significant contestations were local: malaria, yellow fever, city politics, always eventful in late nineteenth century U.S. cities, and a ferocious Mississippi river challenged urban development.

Interestingly, Memphis could afford to maintain rather traditional trading practices. Cotton factors made contracts directly with planters, and no market for futures trading evolved (whereas futures were common for coffee and grain since the late nineteenth century). However, the cotton hub was about more than trade with fibers. Memphis brought foodstuff back to plantations. Engineers located in the city helped planters to cope with drainage problems. Whereas Cronon's discussion of Chicago focused on the com-

29 Bernd-Stefan Grewe, "Das Ende der Nachhaltigkeit? Wald und Industrialisierung im 19. Jahrhundert," *Archiv für Sozialgeschichte* 43 (2003): 61–79.

30 William Cronon, *Nature's Metropolis. Chicago and the Great West* (New York and London: Norton, 1991).

modification of nature, Whayne shows that Memphis was really a comprehensive service provider for the cotton hinterland. It would be worthwhile to look at other urban centers in plantation regions and compare their significance. Does every plantation commodity need a hub? Or is the need related to a certain volume of trade or a specific level of technological development?

If we follow the commodity chain beyond the hub, we ultimately end up with the consumer. We can see the mystery of consumer preferences nicely in McCook's discussion of Liberian coffee, where taste was a key issue. That makes for several levels of complication. Taste is personal rather than collective, it is tied to cultural preferences, and it is hard to pin down for a historian. From an environmental perspective, perhaps the most interesting issue is the inconsistency of taste: biological diversity has ecological merits, but there is only so much variation that modern consumers can tolerate. It is hard to tell in retrospect whether Liberian coffee was doomed because of its weird taste or because of the absence of a "right" taste. Even more, it is hard to say how historians can arrive at an informed conclusion on this matter.

When it comes to the second half of the twentieth century, thinking about plantations, consumers and the environment inevitably brings up the issue of pesticides, along with the difficulties of making sense of them. As Klanovicz shows, the problem was not just about material dangers but also about producers and consumers living in different worlds. Late twentieth century urbanites rarely understand the sense of spraying: for them, it is simply indiscriminate use of toxic substances. Agriculturalists may find that a rather uninformed view of the matter, but then, things look a bit different when you regard them from the other end of the commodity chain.

Plantations Forever?

Most of the plantation systems discussed in this volume are still around. Guatemala and East Timor are still deeply invested into coffee, the U.S. South continues to produce huge quantities of cotton, and to Brazilians, Fraiburgo still means first and foremost apples. Of course, modern technology has changed production methods profoundly, but that arguably makes the resilience of plantation systems even more impressive. Somehow people find it difficult to abandon plantations: as this volume was going to press, the latest news from Florida is that Coca-Cola will spend $ 2 billion to plant

25,000 acres of oranges, notwithstanding the fact that, as it stands, these trees will be easy prey for citrus greening.[31]

Of course, scholarly bifurcation may be at play here: plantations that persist claim the historians' attention more easily than plantations that collapsed. However, failures can be quite revealing, and the articles of McCook and Temudo demonstrate two very different paths towards the end. In the case of Liberian coffee, a plantation system collapsed in the making, and failure helped to blaze the path for the more successful robusta variety. On São Tomé and Príncipe, the time span is vastly greater: plantation systems for sugar, coffee and cocoa left their mark on the islands over the centuries, including a Soviet-inspired period with state-run plantations where managers came from the old elite. However, the combination of fluctuating cocoa prices, famine, mismanagement and the end of Soviet power resulted in a push to diversify and change land ownership patterns—though land reform was ultimately more successful in jeopardizing traditional plantations than in ending social discrimination.

All in all, plantations offer plenty of fodder (if the metaphor is allowed) for the open-minded historian. But at the same time, a plethora of perspectives tends to create a yearning for a grand theory that brings it all together. Several papers juggle with Jim Scott's idea of "high modernism", but that concept remains strangely unspecific as to time, place, and thematic context.[32] Maybe wrestling with complexity *is* the sales pitch? One of the key insights of plantation history is that you never know where problems will come from, and environmental historians are well poised to highlight some of the more inconspicuous causes of trouble. As actors go, insects, microbes and weeds make for less-than-perfect heroes, but they deserve their place in our narratives of the global plantation—and not just because you probably care about that daily glass of orange juice.

31 *New York Times*, May 10, 2013, A14.

32 James C. Scott, *Seeing Like a State. How Certain Schemes to Improve the Human Condition Have Failed* (New Haven: Yale University Press, 1998).