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Michitake Aso, *Rubber and the Making of Vietnam: An Ecological History, 1897-1975* (Chapel Hill: University of North Carolina Press, 2018). ISBN: 978-1-4696-3715-0

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Introduction by Kara Murphy Schlichting, Queens College CUNY

With grace and confidence, **Mitchitake Aso** pursues a multitude of ambitious goals in *Rubber and the Making of Vietnam*. Aso illuminates a complex weave of local and global histories through the mutually-reinforcing goals of colonialism and capitalism that shaped nature via rubber production and laborers' bodies. *Rubber and the Making of Vietnam* is at once an ecological perspective on the power of rubber to shape human societies, economics, and politics; an exploration of the cultural and material aspects of the human-nature relationship; an analysis of the often deadly collision of colonial discourse and medical knowledge on and in the bodies of plantation workers; and a history of how a single environmental commodity, the sap of the *hevea brasiliensis* tree, can influence nationalism, decolonialism, and nation-building. Not one to shy away from complexity, Aso brings to light the entanglement of science, commerce, and governance on Southeast Asian rubber plantations in both colonial and postcolonial Vietnam.

Teresa Cribelli opens the roundtable by considering how the colonial project privileged formal science over informal knowledge in foreign environments. As a historian of industrial forestry and modernization in nineteenth-century Brazil, Cribelli brings to this roundtable an important comparative perspective on the environmental history of rubber plantations and foreign capital in global commodity production. Examining the ideology of French plantation-making, Cribelli asks Aso to situate rubber alongside other plantation commodities (coffee, tea) that have been fundamental to imperialism and the industrialization of agriculture. Cribelli also wants to know more about the laborers who produced rubber. How did workers interpret the rhetoric of nationalism and modernity applied to their lives post during and after French colonialism?

Amy M. Hay also focuses on labor, a central facet of Aso's history. Hay considers Aso's evaluation of worker productivity and abusive labor practices in the context of changing disease environments. As a scholar of medical and environmental history, Hay focuses on Aso's efforts to recover rubber plantation workers' experiences of environmental change and health problems. Aso draws together the ways in which disease and medical knowledge, agricultural science, and business goals impacted worker health and bodily fitness. Hay raises crucial points for discussion of how labor shortages, environmental conditions, and inadequate medical care dangerously intensified workers' health challenges. Hay also pushes Aso to situate his study even more firmly in the governance and material geography of Vietnam, initiating a conversation with Aso about the difficulties of writing local history for readers who may be less familiar with modern Vietnamese history.

A scholar of both French history and the global history of rubber, **Stephen L. Harp** shares his expertise concerning the archives and scholarship on rubber production in Vietnam. And Harp uses his expertise to underscore the level of scholarly mastery

Aso has achieved in *Rubber and the Making of Vietnam*. Harp evaluates the archival record and historical traditions in which Aso writes, illuminating this book's intellectual connections to geography, global environmental history, and the social history traditions of the French Annales School. Harp presents a number of questions that Aso takes up in his response. Like his fellow roundtable reviewers, Harp looks to understand Vietnamese rubber production in the context of its production in Malaysia and Indonesia. He also asks probing questions about Vietnam's cultural and consumer relationship to the rubber made on its plantations.

Rubber and the Making of Vietnam is at once a global history and a local history. Anthropologist **Pam McElwee**, following themes her fellow reviewers introduce, considers how Aso situates rubber-growing in Vietnam alongside global histories of colonial rule and plantation economies. She asks questions on Indochina's position in the larger colonial world and the impact of postcolonial factors of globalization, synthetic rubber, and new technologies. A scholar conversant in the fields of anthropology and forestry, geography, and ecology, McElwee also probes Aso's application of theoretical frames and the concept of nature's agency. In his response, Aso addresses the reviewers' comments with the metaphor of a tree growing, unable to spread indefinitely, but branching in satisfying directions to incorporate themes of labor, consumption, scale, and flow. This is a fitting metaphor both for Aso's subject, the *hevea* tree, and the field of environmental history.

Before turning to the first set of comments, I would like to pause here and thank all the roundtable participants for taking part. In addition, I would like to remind readers that as an open-access forum, *H-Environment Roundtable Reviews* is available to scholars and non-scholars alike, around the world, free of charge. Please circulate.

Comments by Teresa Cribelli, University of Alabama

If the ascension of rubber as a global commodity was first primarily a Brazilian phenomenon (the main tree that produces it is native to the Amazon) and a British one (the English bio-pirate, Henry Wickham, is credited with delivering 70,000 *Hevea brasiliensis* seeds to the Royal Botanical Gardens, Kew in 1876, enabling the plant's introduction to Asia soon thereafter), Michitake Aso's *Rubber and the Making of Vietnam* shows that by the end of the nineteenth-century, rubber also became thoroughly Vietnamese. In a richly researched book drawing from the primary sources of three continents, Aso situates a humble plant material (rubber is made from a protective sap secreted by wounded trees) at the intersection of science, colonialism, national and global politics, national identity, industry, medicine, and modernity in Vietnam.

From the perspective of a scholar of Latin America with little overall knowledge of Asian historiography, Aso's description of rubber production in Vietnam is strikingly familiar. As in Brazil, the history of Vietnamese rubber includes the following themes: the privileging of formal science over informal knowledge; European and Euro-American attempts to subjugate the dangerous tropics; exploitative labor regimes and the "moral" or "immoral" workers they managed; the environmental transformation of inner and outer landscapes (Vietnamese rubber plantations were transformed into "bird-less forests" while workers' bodies became either reservoirs for malaria or the first defense against its spread); mass migration; industrial agriculture; medicine; and finally, projections of nationality and modernity both within the nation and globally. Aso's research comprises a rich nexus of ideas emanating out of and onto the site of rubber plantations.

Where the histories of Brazil and Vietnam differ is in the fact that the former was an independent nation when rubber emerged as a global commodity in the nineteenth-century. In Vietnam, rubber plantations were first and foremost a French colonial endeavor, imposed from the outside. Brazilian rubber was harvested from wild trees with a rural, sometimes coerced, labor force that worked alone in miles of unmanaged forest. In contrast, Vietnamese rubber production was highly regimented in cultivated plantations, dependent on infusions of capital and the relocation of labor, and fully integrated into colonial scientific networks. Whereas malaria was an on-going fact of life in the Brazilian Amazon and Vietnam, deforestation and the creation of rubber plantations hastened the arrival and spread of the disease in the latter through the concentration of people and the creation of plantation ecologies conducive to mosquito reproduction (114-115). In this regard, *Rubber and the Making of Vietnam* provides both a continuation and counterpoint to Seth Garfield's history of Brazilian rubber, *In Search of the Amazon: Brazil, the United States, and the Nature of a Region* (Durham: Duke University Press, 2013).

The places where Vietnam stands apart from Brazil resonated strongly with this reader. Aso argues persuasively for the political importance of rubber plantations,

first as locations of colonialism where Asian laborers were “civilized,” and later as sites of contestation by those same workers. The concentrated populations in plantation housing enabled labor organization and communist recruitment; this was difficult in Brazil’s remote forests. Here the French word for development, *mise en valeur*, is helpful for underscoring the symbolic meanings of plantations and their trees. *Mise*, translated as setting or place, indicates a physical space where an action – in this case the creation of value in both a social and economic sense (*valuer*)– is enacted. Plantations were where the rubber hit the road (pardon the expression), acting as the catalyst for transforming unruly tropical environments and Vietnamese workers into modern landscapes and people. The underside of this, of course, was that plantations were infamous for exploiting workers, a fact that provided ample material for critics who decried plantations as “hells on earth” (207). The rubber trees themselves provided shifting metaphors as sometimes the destroyers and sometimes the saviors of Vietnamese bodies and ultimately the nation. The concentration of resources (food, roads, water, housing, and medicine) on plantations made them the targets of anti-colonial and communist actors, and, conversely, potential locations of moral support and physical succor for the same as the conflicts of twentieth-century Vietnam unfolded. As in Brazil, the meaning of rubber trees and rubber workers transformed depending on political, ecological, and economic contingencies.

Out of this rich work, a few questions arise. Aso makes a passing reference to alternate plantation economies (coffee, tea, and cinnamon) but states that they did not have the symbolic power of rubber because of the latter’s central role in industrial society, supplying the sinews of machinery in the form of gaskets, belts, hoses, and tires (253). As consumable commodities, coffee and tea simply did not represent the same transformative potential. It would be interesting to understand the broader context of how these alternate plantation products integrated or perhaps competed with rubber as sites of development. Additionally, did the cultivation of traditional crops such as rice inspire national rhetoric, or was it only rubber? Were there debates and discussions about which type of plantation agriculture was better suited to Vietnam and therefore supportive of Vietnamese modernity? How did these other plantation products fare in the turbulent years of the Indochina and Vietnam (American) wars? Finally, Aso’s export figures for rubber for 1960 to 1972 underscore the continuing importance of rubber; it would be interesting to situate these numbers within the greater economic output for the same years (270).

Another question for this reader centers on deeper insight into how the workers themselves interpreted and understood the rhetoric of national identity and modernity that was transposed onto plantations. The author provides a wonderful excerpt from a recruiting poem recalled by a former rubber worker that promised food, education, medicine, and income to potential workers composed in traditional Vietnamese verse (206). Above the material benefits promised (sometimes falsely) by plantation recruiters, how did the workers themselves feel about their role in the project of national identity and modernity? In a related query, how did workers,

peasants, and Vietnamese society conceptualize Vietnamese nature (tropical forests in particular) beyond the plantation, especially in the 1960s and 70s?

In closing, Aso's inversion of Henry David Thoreau's famous trope of nineteenth-century industrialization —the disruptive and noisy "machine in the garden" — is his most powerful metaphor for linking rubber to other tropical regions and to the industrialized world. Aso asserts that rubber plantations were —and are— "gardens in the machine" of modern industrialization, reminding us that at the deepest level developed nations still depend on the power of plants, whether it be fossil fuels (the stored energy of a long-dead biome) or the living trees that metabolize the chemicals, fibers, and compounds that humans transform into consumer goods (44). Borders and national divisions are arbitrary markers when considered against the backdrop of transportation and supply networks that funnel tropical commodities to consumer markets in temperate nations. Vietnam's rubber plantations may seem distant in place and even time, but their products sit at the heart of the machines that enable our daily lives. The humble rubber tree helped to shape modernity, rendering Vietnam's history of rubber our history too.

Comments by Amy M. Hay, University of Texas Rio Grande Valley

Mitchitake Aso's *Rubber and the Making of Vietnam* makes important contributions to an extensively studied field of scholarship. His astute and sensitive handling of valuable sources helps illuminate his story of colonial and postcolonial rubber production and trade in Vietnam. Aso's meticulous research includes the recovery of rubber plantation workers' experiences from unpublished memoirs. Putting these experiences at the center of his story represents the book at its best – nuanced, detailed, and compelling. These powerful stories, though, sometimes get lost in the sprawling, ambitious telling of the central role rubber plantations played in everyday life, scientific and medical knowledge, and colonial and nationalist narratives.

The story of rubber in Vietnam initially follows the classic pattern of imperial resource extraction. But unlike other examples, rubber plantations became figurative and literal spaces of resistance and change as the region transformed from colonial empire to eventually a unified nation. The development of rubber cultivation, production, trade, and the challenges embedded in these processes represent French and Vietnamese attempts to modernize.

The ambivalence the French displayed toward the development of a rubber industry (despite the increasing number of uses for the material) meant that rubber was not preordained as the essential crop produced in the colony. Along with governmental distractions, two major challenges hindered rubber production: chronic labor shortages and workers' health. The demand to recruit laborers from the north to work on the red and grey land rubber plantations remained constant. The horrific work conditions stayed the same as well. Planters refused to take responsibility for the humane transportation of labor, decent housing conditions, adequate medical care, or financial support for injured or killed workers. Plantation management exhibited severely punitive practices, such as refusing to increase workers' food rations, which they claimed would be gambled away. Colonial officials were mostly ineffectual in advocating for workers or checking planters' excesses. Tensions between highland and lowland peoples were complicated by the racialization of disease.

The environmental changes needed to plant rubber trees and create plantations intensified the health problems, most particularly that of endemic malaria. Planting *hevea* resulted in significant deforestation, and the connection between these newly cleared lands and road and bridge networks resulted in lethal malaria outbreaks. While this environmental change may have decreased the habitat of one kind of mosquito, it created natural conditions that promoted a complementary species effective in malarial transmission. Like the problems with working conditions, planters consistently resisted addressing this problem, refusing to provide adequate medical treatment of quinine and penalizing workers by withholding medicine. The cost of making environmental structural changes meant that these projects were

rarely undertaken. Some improvement in housing came about when plantation owners listened to workers and modified homes such as replacing metal roofs with thatch, which was much cooler. The other major health problem appeared in the form of inadequate diets, both in terms of nutrition and calories.

It is this theme and the connections between imperialism, human health, and the environment that merits further attention. Aso mostly focuses on the problem of malaria as it relates to workers' health and productivity. It would have been interesting to see what complaints might have been made by managers and planters, or even to what degree these elites were affected. Another example might be when French scientist Henry Morin, who served as the head of the Pasteur Institute, succeeded in making malaria research count as "pure" science while leaving the practical applications to local engineers and officials. The fact that "pure" scientific research advanced careers demonstrates another kind of colonial exploitation. Vietnamese nationalists also tried to address the problem of malaria with mixed results. Vietnamese physicians distributed pamphlets emphasizing malaria as a threat more serious than diseases like smallpox because of its ubiquitous presence and harmful effects on women and children. Most physicians continued to emphasize medical treatment versus environmental prevention.

Efforts to improve health and modernize during the postcolonial period continued to center on rubber plantations. One major change in approach, however, was the level of intervention. Unlike the colonial approach which had been top down, the classic example of James Scott's "seeing like the state," postcolonial attempts to improve health and create the institutions of modern society took place on the local level. Aso provides a meticulous discussion of the First Republic of Vietnam and Ngô Đình Diệm's continued efforts to modernize the country. Of necessity as one of the major revenue-producing industries, rubber production figured prominently in these attempts. Both North and South governments sought to address ongoing health concerns such as malaria. Successful eradication campaigns implemented by the Institute of Malariology, established in the late 1950s, lost ground after 1965 as their programs were disrupted by war. Northern experts sent to help address malaria in the South paid an extreme price as some were killed in battle. Ultimately Diệm and subsequent American advisors failed to modernize Vietnamese society.

Aso offers a stellar description of the development and management of rubber plantations under French colonial rule and the ways nationalists later made them central – both economically and symbolically – to their own enterprise. But important points get lost. As a non-specialist reading the book with a background in the use of Agent Orange herbicides during the American conflict, the framing/organization of material does not always appear to do it justice. One simple addition might have been maps, like of the plantation locations based on the information provided in the table on page 109. Or maps showing the migration routes taken by northern workers recruited to work in the south. (I should note that the primary document illustrations included are rich visuals that illuminate the story being told. This is in no way a critique of them.) Given the many failed

experiments and programs initiated by various governmental bodies in both the colonial and postcolonial periods, James Scott's works on governance might need to be even more prominent. I wanted to know more about the differences between large French-owned plantations and smallholders. Were there differences in their attitudes toward cultivation, labor, or modernization programs? Aside from expense, why was it so difficult to address endemic malaria and nutritional deficiencies throughout the period studied (aside from wartime)? I see it as a good sign when a work raises more questions and regret that my own unfamiliarity limits my contribution to the discussion of Aso's excellent book which offers a valuable approach to writing the history of environment and health.

Comments by Stephen L. Harp, University of Akron

After I published a cultural history of Michelin several years ago and began work on a short global history of rubber for use in world history classes, several colleagues urged me to write a book about rubber in French Indochina.¹ Trained in French history, I objected, claiming that someone fluent in Vietnamese as well as French needed to mine Vietnamese archives in Hanoi and Ho Chi Minh City in order to do the sort of fine-grained local study that has characterized histories of provincial France. I'm thrilled to see that Aso has written exactly that kind of work, surpassing my highest expectations of what such a book might be.

Aso's book is deeply grounded in the archival record. Like many of us, he of course consulted files at the Archives d'Outre Mer in Aix-en-Provence. More significantly, the book relies heavily on documentary sources from the Vietnamese National Archives, not to mention those of the Ecole française d'Extrême Orient and the Lai Khe Research Center. For the period of US intervention, Aso extensively used the U.S. National Archives. He also worked in a series of national libraries and archives in France, Cambodia, and Singapore, as well as the World Health Organization archives in Switzerland. He even conducted interviews of former rubber plantation workers and others involved in the rubber industry. Although the book focuses on rubber-growing areas of Cochinchina, and to a lesser extent Cambodia, the source base is clearly global.

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Like others, Aso seems to bemoan at one point that Michelin, which had extensive plantation holdings in Cochinchina and later Cambodia, is not willing to share materials from its plantations except for puff publications.² However, Aso's work so

¹ *Marketing Michelin: Advertising and Cultural Identity in Twentieth-Century France* (Baltimore, Md: Johns Hopkins University Press, 2001); *A World History of Rubber: Empire, Industry, and the Everyday* (Chichester, UK: Wiley-Blackwell, 2016).

² Aso specifically and accurately mentions François Graveline, *Des hévéas et des hommes: L'aventure des plantations Michelin* (Paris: Nicolas Chaudun, 2006) as a sort of nostalgic piece about colonial

thoroughly considers Michelin and other plantation owners that their reluctance is now largely immaterial. In essence, Aso has used Vietnamese public archives to tell us what we thought we'd need Michelin to learn.

Aso does not mention the French Annales School, but the book seems part of that historical tradition. Admittedly, this environmental history writ large considers topography, hevea trees, malaria, and ecology generally in all chapters, whereas works in the Annales tradition usually set the stage with a long introductory section on the physical space before moving on. Yet in focusing on rubber growing and research in one region, Aso goes into the same kind of depth that characterized works on social history in early modern and modern French history. I have read a fair amount about hevea trees and plantation laborers in French Indochina, British Malaya, the Netherlands East Indies, and Liberia. This is the first time that I have been steeped in the details of plantation workers' lives as if I were reading Annales-inspired classics of French social history, such as Emmanuel Le Roy Ladurie's *Paysans de Languedoc* or Alain Corbin's *Archaisme et modernité en Limousin au xix^e siècle (1845-1880)*.³

Aso's book is clearly a global environmental history, and he deploys all of the key words about interregional and international connections that we have come to expect. However, his research itself does a good deal more, as it is rooted in a specific place and time, so that when Aso generalizes he is unusually credible. Aso's contribution is profound, pushing us beyond the realm of general knowledge and anecdote in the case of Vietnam, contextualizing better-known, long-used published sources such as Tran Tu Binh's *The Red Earth*.⁴ On a fundamental level, I believe that Aso is addressing an imbalance in historical study that Martin Lewis and Kären Wigen laid out for geography. In their *Myth of Continents*, they ask why world atlases frequently have had a mere page on the entirety of China while there have been several devoted to France, as if the major cities of the former were less important than French provincial towns.⁵ In fact, we have deep historical and geographical detail about many villages in France, but yawning gaps in our knowledge of much of the world. For a host of reasons, including the linguistic, financial, and political hurdles that Aso jumped in researching and writing this book, we simply know much less about reality on the ground outside Europe and North America. Don't get me wrong; mine is not an argument to neglect French history. Rather, I'd argue that we need precisely the kinds of studies of other parts of the

rubber plantations Michelin finds acceptable. Eric Panthou (<http://chec.uca.fr/article539.html>) maintains a list of scholars who have attempted to gain access to Michelin and the results.

³ Emmanuel Le Roy Ladurie, *Les Paysans de Languedoc* (Paris: SEVPEN, 1966); Alain Corbin, *Archaisme et modernité en Limousin au XIX^e siècle, 1845-1880: La rigidité des structures économiques, sociales et mentales* (Paris: Marcel Rivière, 1975).

⁴ Tran Tu Binh, *The Red Earth: A Vietnamese Memoir of Life on a Colonial Rubber Plantation*, John Spragens trans. (Athens, OH: Ohio University Center for International Studies, 1985).

⁵ Martin W. Lewis and Kären E. Wigen, *The Myth of Continents: A Critique of Metageography* (Berkeley: University of California Press, 1997).

world that we have for provincial France if we ever hope to understand historical dynamics across the globe. Aso's book is a model.

I have no criticisms. My mandate in the roundtable was to raise issues that Aso could then consider. Requests for more after reading this book feel like intellectual gluttony, but I'll try to imagine what sorts of additional desserts Aso might whip up for us in his response.

I wonder if Aso has already done more reading in order to place ideas of Vietnamese national identity in the context of Southeast Asian nation building more generally. Rubber was definitely key in Vietnam, but that was also the case in Malaysia and Indonesia—both of which were of course far larger producers and exporters of rubber than French Indochina or Vietnam. How did Vietnam compare?

While I was at first surprised that Aso didn't seem to use Richard Tucker's *Insatiable Appetite* on the connection between North American consumption and Southeast Asian production, he clearly understands the dynamic.⁶ However, I wonder if Aso could tell us more about rubber consumption in Vietnam. There are a couple of points in the book when he notes how few manufactured rubber goods were produced in Vietnam, but I'd like to hear more. Where did tires and flipflops come from in both North and South Vietnam? What did they cost? Were there any other rubber goods? Condoms? Who had access and when?

Finally, just as Corbin moved from his detailed social history of the Limousin region of France to do cultural history more generally, I wonder if Aso would offer his sense of rubber as a cultural symbol in Vietnam. When I visited the Cu Chi tunnels in 2004, Viet Cong sandals made of former tires were on display. The sandals implied both the penury and the ingenuity of North Vietnam. What were the other cultural meanings of rubber products—admittedly sparse compared to those in the U.S. as described by Tucker—in Vietnam?

In his conclusion, Aso mentions a couple of key scenes in Régis Wargnier's film *Indochine*. The film also has a scene featuring a burlesque show and a song about rubber, clearly tapping into European fetishization of rubber in the twentieth century.⁷ Was rubber fetishized in Vietnam? Or was the connection of rubber/latex and sex solely a European and North American one, resulting partly from the "exotic" origins of natural rubber and partly from the longstanding use of rubber for contraceptives (and, after World War II, sex toys)?

⁶ Richard P. Tucker, *Insatiable Appetite: The United States and the Economic Degradation of the Tropical World* (Berkeley: University of California Press, 2000).

⁷ The song, "La môme caoutchouc," itself first appeared in film in the *Coeur de Lilas* [*Heart of Lilac*], sung by Jean Gabin and then the music hall star Fréhel, so Wargnier was referring both to cinematic precedent and to the connection between rubber and sex.

This is an excellent book. It leaves a reader asking for more, not because anything at all is wanting, but because it is so well done. Historians of agriculture, science, labor, and disease, not to mention those of the French empire, Vietnam, and U.S. intervention, will all want to take the time to read it carefully.

Comments by Pam McElwee, Rutgers University

As of 2018, Vietnam is now the third largest rubber producer in the world after Thailand and Indonesia, recently surpassing historical leaders like Malaysia. This current success belies the delays, ambitions, conflicts, experimentations, interruptions and rebirths that surrounded the introduction of Pará rubber (*Hevea brasiliensis*) into Indochina, the subject of Mitch Aso's extensive and meticulous examination in *Rubber and the Making of Vietnam: An Ecological History, 1897-1975*. In this work, Aso describes the "entanglement of science, commerce and governance" that made the creation and expansion of rubber plantations possible, and which contributed to the shaping of modern Vietnam (3).

The development of rubber-growing in Vietnam comports with other studies of colonial and plantation economies in that intertwined histories of people, landscapes, animals, microbes, and plants, engaging with each other through conflicts, evolutions, flows, and cooperation, make the story what it is. In this the book shares with Judith Carney's *Black Rice* a focus on the importance of the mutual constitution of people and plants, while the interest in colonial scientific knowledge production follows paths laid down by Diana Davis' *Resurrecting the Granary of Rome*. Aso's work also fits into a growing body of environmental and ecological histories in Southeast Asia. Such approaches are particularly wanting for Vietnam, with only a handful of people, such as David Biggs, myself (although I am an anthropologist, not a historian), and a few others having published on this wide-open field. Aso's book thus contributes to an important emerging dialogue on the role of environment in shaping the course of Vietnamese history, as the country has struggled through colonization, decolonization, independence, war, socialism and capitalism, each era entangled with nature and landscapes in unique but often understudied ways.

Rubber and the Making of Vietnam begins with the changing perceptions and management of southeast Indochina's landscapes as French colonial rule began in the 1860s. The countryside had to be both mentally and physically remade as unproductive wastelands, or in other cases gazetted into forest and native reserves through a handy division of zoning, before rubber could then be conscripted into service for economic production starting in 1897. New legal rules on land tenure and ownership smoothed the path for creation of large French-owned estates. Of course, many of the land concessions granted in the early 1900s were not in any way unused or empty land; the legal and physical fights of Mnong and Stieng peoples for recognition of their customary claims is evidence of this. The transformation of these *terre rouge* grounds into tidy latex generating parcels gives Aso a mirror with which to understand French colonial concepts of modernity, racialized hierarchies, and ideas of 'nature'.

The success of these new rubber plantations depended on knowledge production about both the rubber plant and associated disease ecologies, including malaria,

which affected a significant percentage of rubber workers, including many recruited from northern Vietnam, as local ethnic minority (Aso uses the term Montagnard) labor was considered less useful. Agronomy and other colonial sciences, particularly medicine and public health, emerged in concert with these nascent plantation landscapes, often influenced by racial and ecological thinking that shifted over time. Agricultural extension was needed to ensure the productive use of the rubber plant and the soils on which it grew, while notions of sanitation, racial separation, and worker health came from medical experimentation.

After chapter 5, the narrative is more explicitly chronological, with the remaining three substantive chapters exploring the roles of plantations during the First Indochina War from 1945 to 1954, when hostage-taking, protection money, and other means of terror by partisans constrained French recapture of the countryside and its many plantations; the First Republic of Vietnam from 1954 to 1963, when rubber production was coopted as a potential tool to inculcate capitalism and settled production among refugees from the North and local ethnic minorities during President Ngô Đình Diệm's term; and the Second Republic from 1963-1975, when US wartime involvement ensured rubber plantations erupted as sites of conflict given the guerilla tactics of the National Liberation Front, which were particularly suited to these landscapes.

Aso argues that his book provides a way to explore the intimacies of global and local scales in which both "met, interacted and reformed each other" (8). While the book does explicate the ties and flows among colonial scientists within an emergent "transnational capitalist system," I remain unconvinced that the conclusion is merited that rubber knowledge "became an object of sharing, competition, and modeling across colonial empires in Southeast Asia," giving rise to "material and mental networks that gave substance to that region" (5, 15). This is not really a book that regionalizes the history of rubber, nor one that explains how networks of scientific knowledge ranged across global borders to create new networks of interaction. Instead, I find it is much more of a localized, but no less useful, argument: that rubber is a helpful tool by which to understand the course of Vietnamese history. Rubber plantations during the early 1900s are emblematic of the laissez-faire and contradictory role of colonial authorities in economic development in Indochina. Then these plantations became sites of labor strikes and social unrest that contributed to anti-colonial sentiment, which the new Indochinese Communist Party was able to turn to its advantage in the 1930s. The inability to control the countryside that was typical of French attempts to recolonize post-1945 Vietnam can be seen through declines in rubber production, even as world demand increased. Rubber producing zones then reflect the failures of top-down planning under President Diem, as well as the poor understanding of actual conditions in the deteriorating security situation throughout the US-backed Saigon regimes. In other words, the changing landscapes of rubber are a reflection of the changing social and economic dynamics of Vietnam throughout the 20th century.

One major question the book tries to answer is why large estates came to dominate the Indochinese rubber landscape, while smallholder production was the norm elsewhere, like the Amazon and Malaysia. In different chapters, the answer is multiple: smallholders had less access to science, land tenure rules rewarded the French colons, planters' associations favored the wealthy, and even access to graft stock limited who could benefit from rubber. These large French estates created both class and racial disparities in production. As Aso notes, while Vietnamese planters owned 50% of rubber operations by 1937, the land area they controlled was only 10% of total production. These policy failures to support smallholder production continued into the post-colonial period, such as under the First Republic, where despite Diem's interest in community and household production and development, smallholders were never able to take advantage of top-down government support programs like the Land Development Program. Another question is why these plantations dominated the southeastern region of Cochinchina, but not other areas of the Indochinese peninsula. Environmental factors are mostly pegged as the reason, although a discussion in chapter 2 on the success of *Ficus* (native rubber) versus *Hevea* (introduced) is blamed on government inaction in Hanoi rather than edaphic or other factors. *Hevea* in fact grows decently in many areas of Vietnam, as evidenced by its rapid spread into even northern regions like Son La, Dien Bien and Lai Chai provinces in the post-2000 period, which argues for economic and political factors as the most important limitations to its expansion in the pre-1975 era.⁸

Aso also peppers throughout the book his interest in presenting nature as an actor and "agent of change and resistance" (1). This recurs mainly in reference to natural checks on the expansion of plantations, whether due to different types of soils or the barriers that malarial miasmas posed. In some cases, nature presented advantages, such as the pronounced dry season in Indochina which may have limited rubber plant diseases, like South American leaf blight. In several chapters, 'nature' is represented by the untamable mosquito, where in a discussion on malarial research and reshaping of colonial bodies, the book refers to Timothy Mitchell's provocative question, "Can the mosquito speak?" Aso states the answer to be yes, noting that French scientists often used anthropomorphic language to refer to mosquitos, thereby explicitly granting the insects agency, and the evidence is clear that the mosquito remade plantation labor practices and colonial science procedures in specific ways. Yet in other places, Aso refers to natures as unruly and unpredictable without specifying exactly what he means, such as the idea "gardens sometimes responded to the social and environmental conditions of Cochinchina and Cambodia in unexpected ways" but where the illumination of what these unforeseen outcomes were and how nature played a role is inconclusive (45).

There are some other paths that emerge in the book, but which are not examined in more depth. One intriguing but unexplored question remains how rubber

⁸ Alan D. Ziegler, Jefferson M. Fox, Jianchu Xu, "The Rubber Juggernaut," *Science* 324, iss. 5930 (May 2009), 1024-5.

plantations might have influenced or differed from the other forms of plantation agriculture occurring at the time in Indochina – coffee and tea production (introduced by the French before rubber), but also jute, pepper and other cash crops. In a discussion of the importance of racial difference and the ways in which housing policy on plantations mirrored the racial divides created for French citizens, Vietnamese, and ethnic minority groups, Aso might have extended his analysis into how other (often contradictory) approaches created landscapes of control and exclusion. These included the paternalistic administration of some *terre rouge* lands in Dak Lak province to the north of the rubber plantation zone where Ede peoples (then known as Rhade) were sequestered and ‘protected’ from Vietnamese influence by colonial administrator Leopold Sabatier. Later midcentury divide-and-conquer politics are reflected in the creation of the *Pays Montagnard du Sud*, a political territory invented in 1946 to contest the Viet Minh’s successes and retain a colonial ‘protectorate’ for non-Vietnamese peoples. To what degree were these territorial strategies and ethnic politics first perfected on rubber plantations?

As an anthropologist, I often ask myself while reading what a non-historian can learn from a work, and what does it bring to other disciplines? In Aso’s case, non-historians may want more of a focus on concerns raised by the field of political ecology. For example, there is not much attention to the varying size of landholdings and comparison across plantations in terms of their workers, earnings, and conflicts. I would have liked to see more of this, including a summary of key sources of investment and the economics that kept plantations viable, just as much as scientific expertise did, and simple measures of economic success, such as prices and proceeds over time, would have helped expand the story. For example, how did a plantation run by Michelin (with vertical ties to a prominent company headquartered in France) differ from a plantation run by a Vietnamese civil servant, both in terms of profitability, but also in terms of how the differential in economics remade specific landscapes? There are strong hints of considerable variations between plantations, reflected in the strikes against and eventual murder of French director Morel on Michelin’s Phu Rieng and Dau Tieng plantations, while those owned by the Red Earth Plantation Company saw less violence, and these variations in both production and conflict were no doubt a reflection of intertwined ecological and socio-economic differences.

Another challenge for the book is the degree to which the focus of the story needs to remain in Indochina, as opposed to a more expansive focus on events elsewhere. For example, what was transpiring in Malaya with the British colonial establishment of rubber only warrants brief mention, despite the similarities (but vastly different outcomes) of the Malay emergency and Viet Minh action in the mid-1940s through the 1950s. Further, one is left wondering about how rubber fit into the French empire in general, particularly in other French colonies where rubber might have been expected to thrive, such as the Ivory Coast or southern India? What was Indochina’s place in the larger colonial world, particularly with regard to science and trade, and to what degree was the Indochinese experience of plantation politics unique or commonplace? Rubber might have been the leading export from South

Vietnam in the 1960s, but how important was Vietnam to rubber consumers? Globalizing factors, such as the rise of synthetic rubber, changes in prices and demand, and invention of new uses and technologies for rubber over time receive somewhat less attention, leading the reader to sometimes feel excessively rooted in Vietnam and unmoored from changes elsewhere in the world.

The book does require some previous knowledge of Vietnamese and French colonial history: assumptions are often made that the reader knows who Bui Quang Chieu and Bay Vien were, what the Cao Dai religion is, or what the Guernut Commission was set up to do. Some terms are used before explanations are provided (or remain undefined), such as *thuoc nam* (traditional Vietnamese medicine), the Stevenson plan, Basallian center-periphery models, or *chamcar* production. One wishes there were more maps as well; there are so many different plantations, soil types, and ecological differences within even the small southeastern region of Vietnam that one brief map does not seem adequate to the task. Theoretically-inclined readers may also find the bricolage of theories to be a bit too inclusive. At times, the book refers to actor network theory, to 'ecological modernity', to 'tropicality' (colonial, racial and militant forms), moral economies, biopolitics, and assemblage theory, but never strongly identifies with any of them for longer than a chapter.

But overall, Aso has demonstrated a masterful approach to the subject and marshalled an impressive array of sources. Those who are interested in the ways botany, medicine, nature, colonialism and war interacted to produce novel landscapes will learn much from this work, and historians of Vietnam will find new lenses by which to view familiar timelines and outcomes. Aso should be commended for his comprehensive assessment of the transformation of the Indochinese landscape and peoples, and his book will remain a standard reference on the ecological transformations wrought by capital and colonialism in Vietnam for some time to come.

Response by Michitake Aso, University at Albany SUNY

Writing a Tree-Based History of a Place and Its People

Attention is a rare commodity, or better yet a limiting factor, in academia. I thank Kara Schlichting for organizing this roundtable discussion and the reviewers for taking the time to read my book and respond seriously to it. They bring distinct perspectives and I gratefully accept their smart questions and perceptive critiques.

Reviewers' comments, either implicitly or explicitly, often suggest other possible books. I'll try to resist the temptation to speak about those books. But were I to start writing now, I would have chosen a tree, rather than an iceberg, as the analogy that opens my acknowledgements section. From germination to growth, flowering, and reproduction a book is much like a tree. It has roots that are invisible but that have sustained its trunk and crown. My book is, moreover, a study of how a single tree species can affect human political projects including empires and nations. It adopts not just a human-center perspective on the past, but an ecological perspective that narrates twentieth-century Vietnamese history starting with the rubber tree and branching down, up, and out in multiple directions. And, of course, it's made of pulp.

What were the seeds of my book? It germinated as a dissertation on the environmental history of *Đông Nam Bộ*, the southeast region of Vietnam that borders Cambodia. During graduate school, historians including Suzanne Moon and Andrew Goss nurtured my curiosity about plants and agronomy while Warwick Anderson and Laurence Monnais among others nourished my interest in the history of medicine in Southeast Asia.⁹ *Hevea brasiliensis*, a latex-producing tree which has been harvested in Brazil in the wild, brought together agronomy and medicine in southeastern Vietnam. The well-documented industrialization of this tree and its sap, along with the need for labor on plantations, gave me the necessary sources. And, because this tree has been global since at least the nineteenth century, it allowed me to talk to historians of other regions while remaining grounded in place. Perhaps not surprisingly, it was the historian of France and its empire, Stephen Harp, who observantly notes the implicit role of the French Annales school in my writing. A more recent theoretical inspiration is Anna Tsing's *Friction*, which specifically mentions industrial rubber. These are just a few of the many intellectual roots of my book.¹⁰

⁹ Suzanne Moon, *Technology and Ethical Idealism: A History of Development in the Netherlands East Indies* (Leiden: CNWS Publications, 2007); Andrew Goss, *The Floracrats: State-Sponsored Science and the Failure of the Enlightenment in Indonesia* (Madison, WI: University of Wisconsin Press, 2011); Warwick Anderson, *Colonial Pathologies: American Tropical Medicine, Race, and Hygiene in the Philippines* (Durham, NC: Duke University Press, 2006); and Laurence Monnais, *Médecine et colonisation : l'aventure indochinoise 1860-1939* (Paris: CNRS Editions, 1999).

¹⁰ Anna Lowenhaupt Tsing, *Friction: An Ethnography of Global Connection* (Princeton, NJ: Princeton University Press, 2005).

As my book grew, its heartwood became inextricably tied to what I see as my emotional and ethical commitments to people, to places, and to the discipline of history. My values have been sustained by various springs but I want to highlight one tapped while teaching English in Vietnam as a VIA volunteer from 1999 to 2001, namely that my place in Vietnamese society was to learn just as much as it was to teach. Applying this lesson to my project has meant a respect for the voices of a place and a place full of voices. It has also meant not claiming to speak for anyone other than in my voice as a historian with this profession's questions and values. The past and present is complicated and I have, most of all, tried to keep my curiosity and to restrain myself from drawing oversimplified lessons. I believe that I am not alone in these commitments and it is gratifying to see an expanding group of scholars writing multivocal, multispecies histories of environments throughout Vietnam and Southeast Asia.

The roundtable reviewers have studied my book's trunk, several of its branches, some of its twigs, and even particular leaves. Various themes arise in their thoughtful responses but for clarity's sake I'll organize my response around four keywords: labor, consumption, scale, and flow.

Labor, both human and non-human, was a key process in forming nature and in generating rubber's material and symbolic values. Teresa Cribelli, a historian of Brazil, explores the similarities and differences in human labor regimes in Vietnam and Brazil.¹¹ She strikes at the core of my book when she reminds the reader that *mise en valeur* "as setting or place, indicates a physical space where an action – in this case the creation of value in both a social and economic sense (*valuer*)– is enacted." In Vietnam, unlike Brazil, action involving rubber was centered on plantations, these "forests without birds," and Cribelli is absolutely right that the meanings of plantation rubber depended on whom one talked to and changed over time. While workers', scientists', planters', and government officials' attitudes towards these places of value production didn't depend mechanically on their position in colonial and capitalist hierarchies, they tracked closely. I sought to illuminate workers' perspectives on nature by conducting oral histories with Vietnamese who had toiled on French-owned and operated plantations. I also read colonial sources against the grain and I drew on a series of interviews of plantation

¹¹ Teresa Cribelli, *Industrial Forests and Mechanical Marvels: Modernization in Nineteenth-Century Brazil* (New York: Cambridge University Press, 2016). For work dealing with rubber in the Americas see Warren Dean, *Brazil and the Struggle for Rubber: A Study in Environmental History* (New York: Cambridge University Press, 1987); Mark Finlay, *Growing American Rubber Strategic Plants and the Politics of National Security* (New Brunswick, NJ: Rutgers University Press, 2009); Seth Garfield, *In Search of the Amazon: Brazil, the United States, and the Nature of a Region* (Durham, NC: Duke University Press, 2013); Greg Grandin, *Fordlandia: The Rise and Fall of Henry Ford's Forgotten Jungle City* (New York: Metropolitan Books/Henry Holt and Co., 2009); Barbara Weinstein, *The Amazon Rubber Boom, 1850-1920* (Stanford, CA: Stanford University Press, 1983).

labor carried out in the late 1960s by U.S. province advisors. Unfortunately, I had less access to Cambodian and ethnic minority voices.¹²

Likewise, I thank the Americanist Amy Hay for noticing what may seem like fallen leaves: the hard-won stories of individuals associated with rubber.¹³ Although she wonders if these leaves sometimes get lost among the leaf litter, her feeling speaks to the different audiences I had in mind. I wanted to address historians of the global environment, including those in the United States, and I tried to make my book as inviting as possible for those not overly familiar with modern Vietnamese history. But I was also speaking to a Vietnamese studies audience and I didn't want to burden them with excessive explanations of a shared framework for studying the past. Perhaps, as Hay suggests, more maps, both literal and figurative, would have done the trick.

Finally, I appreciate Cribelli's mention of the "gardens in the machine" metaphor, which points to the non-human labor enacted by plants and animals on industrial plantations. As Cribelli notes hydrocarbons come from plants and I agree that this metaphor, which I borrowed from the historian Ed Russell, reminds us that our supposedly inorganic world utterly depends on the organic.¹⁴ In a similar vein, the twentieth century French geographer Pierre Gourou categorized Vietnamese society as a *civilisation du végétal*. He has a point, if it is understood that every society is still plant based.

The second keyword that the reviewers gesture towards is consumption. Cribelli and Pam McElwee, an anthropologist of Vietnam, cast their gazes about the forest and wonder how the consumption associated with rubber compared to that of other plants such as rice, coffee, and tea. While my book briefly touches up these other plants, it focuses on the rubber tree for three reasons. First, having a plant with a well-documented history of introduction allowed me to make certain conclusions about its effects on local society that studying other plants would not. Second, modern Vietnam contains a multitude of places and it is worth understanding this diversity. Rice has certainly been more important for Vietnamese society for longer periods of time but the centers of rice production, the Mekong Delta and the Red River Delta, already have excellent environmental histories. Third, rubber trees dominated the *Đông Nam Bộ* region in the twentieth century. French planters experimented with other crops including coffee, tea, and cinnamon in the early twentieth century at a moment when they seemed just as promising as rubber. But for many reasons that I don't have the room to discuss here, the industrialization of these other plants did not take off and so were less woven into the fabric of local

¹² See Margaret Slocomb, *Colons and Coolies: The Development of Cambodia's Rubber Plantations* (Bangkok: White Lotus Press, 2007).

¹³ I've left the references to Vietnamese-language archives and publications in the footnotes and bibliography of my book.

¹⁴ Edmund Russell, "The Garden in the Machine: Toward an Evolutionary History of Technology," in *Industrializing Organisms: Introducing Evolutionary History*, ed. Philip Scranton and Susan R. Schrepfer, 1–16 (New York: Routledge, 2004).

society. There is good work being done on the past and present of coffee and tea and I would add maize, and its role as an essential food crop in Vietnamese and ethnic minority society, to this list.

In his sweeping view of my book's landscape, Harp is surprised that he didn't see a deeper engagement with the analysis of rubber consumption laid out in Richard Tucker's *Insatiable Appetite*. Of course, Tucker's book and Harp's own on Michelin were next to me on the shelf as I wrote and I agree that we can't understand the global history of rubber without knowing what drove demand.¹⁵

While I gesture towards consumers in France, there are three reasons why I do not grapple with them in a sustained way. First, the global rubber market is much different than some other global commodity markets. Most consumers of rubber didn't select it based on the characteristic of the latex as they would for, say, milk or bananas.¹⁶ Instead, they have been marketed a selection of finished industrial products (tires, condoms). Second, although the French consumed a lot of rubber, it is difficult to trace its source. Middlemen (almost all male), those buying in bulk, negotiated latex standards, which I hinted at in brief discussions of the 1922 Stevenson Plan and the 1934 International Rubber Regulation Agreement. During the colonial era, rubber from Indochina first flowed to Singapore where it was graded and then sent out to the world. After 1954, some Vietnamese and Cambodian rubber went to Singapore while some leaked to the communist world. In this way, end consumers and producers of rubber were more separated than with other commodities. Third, several historians have written about the global market for rubber.¹⁷ I agree with Harp that an analysis of Vietnamese and Cambodian consumers' ecological effects would have made a fascinating story but I found next to no documentation related to rubber on this question. Perhaps a study of everyday technologies such as the bicycle or the moped would help this story get rolling; or perhaps a cultural history of sex in Vietnam would bring a satisfying answer to the question of rubber contraceptive use.

The third keyword I'll address is scale, which was one of the central concerns of my project. On the one hand, Hay expresses a desire for a more detailed mapping, a microhistory even, of the individual plantations that form the smaller branches of

¹⁵ Richard Tucker, *Insatiable Appetite: The United States and the Ecological Degradation of the Tropical World* (Lanham, MD: Rowman & Littlefield Publishers, 2007); Stephen Harp, *Marketing Michelin: Advertising and Cultural Identity in Twentieth-Century France* (Baltimore, MD: The Johns Hopkins University Press, 2001).

¹⁶ Kendra Smith-Howard, *Pure and Modern Milk: An Environmental History Since 1900* (New York: Oxford University Press, 2014); John Soluri, *Banana Cultures: Agriculture, Consumption, and Environmental Change in Honduras and the United States* (Austin, TX: University of Texas Press, 2005).

¹⁷ Austin Coates, *The Commerce in Rubber: The First 250 Years* (New York: Oxford University Press, 1987); Colin Barlow, *The Natural Rubber Industry: Its Development, Technology, and Economy in Malaysia* (New York: Oxford University Press, 1978); Stephen Harp, *A World History of Rubber: Empire, Industry, and the Everyday* (Malden, MA: Wiley-Blackwell, 2015); John Tully, *The Devil's Milk: A Social History of Rubber* (New York: Monthly Review Press, 2011).

my book. I didn't provide a planation by plantation study as that seemed to me a sure way to drive off any general reader – I kept the spreadsheets of plantation data for my own enjoyment. Furthermore, as I wanted to trace the interactions of rubber trees with twentieth-century Vietnamese history, I did not feel compelled to exhaustively write the history of rubber in Vietnam, thus making an already long book longer. Instead, I attempted to offer more digested conclusions from the study of individual plantations, with carefully chosen anecdotes, twigs if you will, to illustrate my points. Those looking for plantation details can turn to publications by the planters' association and scholarly works on particular plantations.¹⁸ On the other hand, McElwee wants me to make broader comparisons. She suggests, for example, that I needed to do more to justify my claim that rubber trees contributed to a shared identity and material substance of Southeast Asia. While I stand by my claim, it was not the point of my book. In fact, she thought that my book was "excessively rooted in Vietnam" and would have appreciated a more global approach. I was constantly thinking about regional and global developments and I chose rubber precisely because it was widespread throughout Southeast Asia and other parts of the world.¹⁹

Methodologically, I split the difference between Hay and McElwee, and went for a unit of analysis in the middle. I applied a tree-based study of global networks running through a locality rather than a study of placeless networks along which trees, people, and commodities moved. As McElwee notes, I was curious about how rubber-scapes informed twentieth-century Vietnamese history and a book substantiating Southeast Asian, and global, networks would have been a very

¹⁸ Christophe Bonneuil, "Mettre en ordre et discipliner les tropiques : les sciences du végétal dans l'empire français, 1870-1940" (PhD diss., Université Paris VII-Denis Diderot, 1997); Marianne Boucheret, "Les plantations d'hévéas en Indochine, 1897-1954" (PhD diss., Université Paris 1-Panthéon Sorbonne, 2008); Pierre Brocheux, "Le prolétariat des plantations d'hévéas au Vietnam méridional : aspects sociaux et politiques (1927-1937)," *Le mouvement social* 90 (1975): 55–86; William Gervase Clarence-Smith, "The Rivaud-Hallet Plantation Group in the Economic Crises of the Inter-War Years," in *Private Enterprise During Economic Crises: Tactics and Strategies*, ed. Pierre Lanthier and Hubert Watelet, 117–32 (New York: LEGAS, 1997); Webby S. Kalikiti, "Rubber Plantations and Labour in Colonial Indochina: Interests and Conflicts, 1896-1942" (PhD diss., University of London, School of Oriental and African Studies, 2000); Martin Murray, "'White Gold' or 'White Blood'?: The Rubber Plantations of Colonial Indochina, 1910-40," in *Plantations, Proletarians, and Peasants in Colonial Asia*, ed. E. Valentine Daniel, Henry Bernstein, and Tom Brass, 41–67 (London: Frank Cass, 1992); Eric Panthou and Tran Tu Binh, *Les plantations Michelin au Viêt Nam* (Vertaizon: La Galipote Editeur, 2013); Sébastien Verney, "Le nécessaire compromis colonial : le cas de la plantation Michelin de Dầu Tiếng de 1932 à 1937," in *Les administrations coloniales XIXe-XXe Siècles, Esquisse d'une histoire comparée*, ed. Samia El Mechat, 163-74 (Rennes: Presses universitaires de Rennes, 2009).

¹⁹ For elsewhere in Southeast Asia, see Michael Dove, *The Banana Tree at the Gate: A History of Marginal Peoples and Global Markets in Borneo* (New Haven, CT: Yale University Press, 2011); John Drabble, *Rubber in Malaya, 1876-1922: The Genesis of the Industry* (Kuala Lumpur: Oxford University Press, 1973); Ann Stoler, *Capitalism and Confrontation in Sumatra's Plantation Belt, 1870-1979* (Ann Arbor, MI: The University of Michigan Press, 1995); Voon Phin Keong, *Western Rubber Planting Enterprise in Southeast Asia, 1876-1921* (Kuala Lumpur: Penerbit Universiti Malaya, 1976); Voon Phin Keong *American Rubber Planting Enterprise in the Philippines, 1900-1930* (PhD diss., University of London, School of Oriental and African Studies, 1977).

different book indeed.²⁰ And while some might see it as old growth forest, Harp is right that the Annales school was a very useful model for the kind of history I attempted to write. I approached my study with awareness of global networks flowing through places that operate on the long, medium, and short terms. Rubber was useful exactly because of its richly-formed networks that were grounded in place and time even while, as Harp points out, the source base for my findings is global.

The final keyword that I'll touch on is flow, narrative and theoretical. Hay traces one of the main branches of my narrative, namely the history of environment and human health and she raises the thorny issue of evenness of coverage.²¹ As Hay knows, a major difficulty for those working with Vietnamese sources is dealing with a documentary record made patchy by war and other disruptions. This dappled coverage meant that I gave more attention to some themes at certain places in the book than others. I also chose not to make similar points repeatedly in favor of exploring a range of themes. Thus, while I analyze environmental change in relation to colonial conquest, land tenure, the rhetoric and practice of science and medicine, and global markets in the pre-1945 era, I focus more on the effects of labor relations, nationalism, postcolonial politics, and warfare during the period from 1945 to 1975. Doing so allowed me to put the colonial and the postcolonial in the same analytic framework and show how the major factors shaping Vietnamese natures shifted over time. Grafting the colonial to the postcolonial is still, for better or worse, rarely done in monographs on Vietnamese history.

For her part, McElwee raises the question of theoretical arc, which is not surprising given her own far-reaching studies of Vietnamese culture and nature.²² McElwee notes, for example, that "theoretically-inclined readers may...find the bricolage of theories to be a bit too inclusive." As a historian, I pick up and put down whatever theory seems to best fit the analysis of a particular source that I have been able to unearth. Some may see this as bricolage but I see this as a strength of the profession. In fact, I subtitled my book an ecological history, rather than an environmental history, because I'm looking more at processes and relationships and less at things singular and static, a theme I explore in my book through discussions of an ecological perspective. Practicing ecologists may challenge my appropriation of their discipline's name and cultural understandings of the environment were not a concern of ecologists for much of the twentieth century. But as some realized that all processes in nature were already affected by humans, they began to pay more

²⁰ For such an approach see Deborah Neill, *Networks in Tropical Medicine: Internationalism, Colonialism, and the Rise of a Medical Specialty, 1890–1930* (Stanford, CA: Stanford University Press, 2012).

²¹ Amy Hay, "A Kind of Mylai . . . Against the Indochinese Countryside': American Scientists, Herbicides, and South Vietnamese Mangrove Forests," in *The Mekong Delta: Environmental Change and Agricultural Sustainability*, ed. Mart A. Stewart and Peter A. Cooclanis, 69–82 (New York: Springer, 2011).

²² Pamela McElwee, *Forests Are Gold: Trees, People, and Environmental Rule in Vietnam* (Seattle, WA: University of Washington Press, 2016) is still one of the few environmental histories set in Vietnam.

attention to humans. In a reciprocal fashion, historians are paying close attention to natural processes. My work aims to engage with this converging view of ecology that calls for the use of many tools.

Finally, McElwee identifies one of the theoretical nodes, or knots, in my book: the question of nature's agency. I choose *hevea brasiliensis* in part because of the way it seemed to draw people into its orbit in the nineteenth and twentieth centuries. I did struggle with the issue of whether or not to call this action agency, or some other word; perhaps factor, as my sister suggested, would have been a less loaded term. I chose agency because of the theoretical work growing up around this word. I tried to define carefully and qualify my use of this term but I have received pushback, especially from scholars who have not wandered much among these debates. If I read her comments correctly, McElwee is saying that the "nature as agent" position implies at least some predictability even without human-like intentionality. Yet nature, like humans, is inconsistent and can be predictable and open to manipulation at certain times and places and wild and unruly, escaping human control and even comprehension, at others. This is not the time, nor the place, however, to wander in this theoretical grove.

To conclude I want to highlight one last branch that I did not explore as much as I wanted, namely the gendered aspects of rubber. Gender was on my mind and I included it as a category of analysis as documentation allowed. Yet, I could have made more of the fact, for example, that the rubber labor force became more female from the 1950s to the 1970s as men went to fight in the Vietnam War. The fact that the reviewers did not take me to task on this point underlines even further their generous spirit. And with that I want to thank again Kara for her excellent work organizing this roundtable, and the reviewers for peppering me with questions, for offering suggestions about how to prune and reshape my book, and for keeping the academic forest healthy and vibrant.

About the Contributors

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Teresa Cribelli is associate professor of history at the University of Alabama. She is the author of *Industrial Forests and Mechanical Marvels: Modernization in Nineteenth-Century Brazil* (Cambridge University Press, 2016) which won honorable mention from the Brazil Section of the Latin American Studies Association. Her present research follows two lines of inquiry: readers' letters, public printed space, and the newspaper press, and a comparison of narratives of progress and frontier expansion in nineteenth-century Brazil and the United States. She is a member of the Rede Proprietas, organized by Dr. Márcia Motta at the Universidade Federal Fluminense. She is currently collaborating on a project with Dr. Mônica Martins of the Universidade Federal Rural of Rio de Janeiro on Brazil and the United States in nineteenth-century international exhibitions.

Stephen L. Harp is distinguished professor of History and professor of French at the University of Akron. He is the author of *A World History of Rubber: Empire, Industry, and the Everyday* (2016); *Au Naturel: Naturism, Nudism, and Tourism in Twentieth-Century France* (2014); *Marketing Michelin: Advertising and Cultural Identity in Twentieth-Century France* (2001); and *Learning to Be Loyal: Primary Schooling and Nation Building in Alsace and Lorraine, 1850-1940* (1998). He is currently at work on a book tentatively titled "Mediterranean Migrations: The Social and Environmental Impact of Twentieth-Century Mass Tourism on the French Riviera.

Amy M. Hay joined the University of Texas – Pan American, now known as the University of Texas Rio Grande Valley, in 2006. Her areas of research and teaching specialization include 20th-century American history, American women's and gender history, and medical and environmental history. She spent a summer in Philadelphia on a Chemical Heritage Foundation fellowship, and a year in Germany as a Carson Fellow at the Rachel Carson Center for Environment and Society in Munich. She has published on Love Canal in the *Journal of Women's History* and *Environmental History*. Her current book manuscript uses Agent Orange as a lens to investigate the use of herbicides as a means of international and domestic Cold War environmental containment and is under review with the University of Pittsburgh

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