



CHAPTER 9

Disrupted Ecologies: Conflicting Repertoires of Colonial Rule in Early Twentieth-Century São Tomé

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INTRODUCTION

The first months of 1909 were troubled times in the equatorial Atlantic island of São Tomé. In mid-March, after a long controversy opposing British chocolate manufacturers and Portuguese cocoa planters, the firms Cadbury, Fry and Rowntree decided to boycott São Tomé's "slave-grown cocoa". To cope with the consequences of the embargo planters turned to the colonial government. Asking for the state's assistance was a common practice. Even if the island's economy had been driven by private investment, the state had always supported the plantations by regulating the market, facilitating access to land and, most significantly, by enforcing labor-recruiting policies. Estate owners were, once again, demanding Portuguese diplomacy to work on their behalf to legitimize plantation labor practices.¹ But labor was not the only problem they had to face. In April, planters issued another call for help. This

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time they requested agronomic science to deal with an unknown disease that affected cocoa trees, which, according to them, “had already produced great economic damage”.²

São Tomé was not a newcomer to the world commodity trade. Sugar made the island the first plantation economy in the tropics in the early sixteenth-century, before the plantation revolution of the Caribbean.³ Various circumstances led to the decline in sugar production around 1600. After serving as a food supply station for the slave-ships connecting the Gulf of Guinea with Brazil, in the mid-1800s the plantation system was revived, inspired by the Brazilian coffee boom in the Paraíba Valley. Coffee paved the way for cocoa cultivation in the 1880s. The history of the exploitative and racialized São Tomé’s plantation complex has been the subject of extended scholarship,⁴ but this literature has not paid much attention to the political economy of plantation ecologies. In this chapter I want to discuss the conflicts that emerged when the first signs of environmental disruption began at the turn of the twentieth-century.

The transformation of São Tomé in the “purest model of a plantation colony”,⁵ by the early 1900s, was not only the result of continuous power struggles between planters, the state, native population and indenture laborers but also between those human actors and the environment. For the French botanist Auguste Chevalier there was no such thing as too many adjectives to describe planters’ battle against the rainforest of São Tomé. During his visit to the island in 1905, he wrote about the “fantastic chaos of mountains cut by ravines”, the “tumultuous torrents”, the “thick fog that never seems to lift” and the “tormented equatorial vegetation” that made this country at first sight the “least fit place for agriculture”. Only with “prodigies of effort and ingenuity” that implied “slaughtering the forest giants”, “damming the torrents” and building kilometers of railways had this “savage nature” been converted into a “methodically maintained tropical garden” where “the cocoa tree now prevails”.⁶ Chevalier’s narration was part of the repertoire colonial scientists used to make sense of the environments in the periphery of European Empires. Nature was portrayed as a wild and empty terrain, a new resource frontier, ready to be appropriated by planters for the production of cash crops. However, in order to create such fictional nature, long-term social occupation of these spaces had to be voluntarily ignored. For example, in São Tomé, the marooning features of the Angolares community in the south of the island were suppressed from the colonial literature and are only now being the object of historical analysis.⁷

If, according to Chevalier, the “rational methods inspired by the progress of modern science” had allowed for the planters’ influence over the island’s environment, the transformation of São Tomé’s “virgin forest” into productive plantations tell a more complicated story that can hardly be framed within clear-cut binaries of domination and resistance. In fact, the supposedly undisputed imperial interventions in the tropics had always been disturbed by natural phenomena. Along with other fragile ecologies, overexploited islands were the settings of well-known episodes of rapid ecological deterioration. The pace and dimension of the transformations introduced by Europeans took observers by surprise, and experts tried to find different strategies to assert colonial power over these environments. Richard Grove made clear how places such as Mauritius, St. Helena or the islands in the Caribbean provided fertile ground for theoretical enquiries about the consequences of deforestation even before the eighteenth-century.⁸ Grove also pointed out the science/policy and state/market conflicts that emerged from those disrupted landscapes. In such colonial peripheries, experts understood that “rational” exploitation of the land was also a predatory activity and fought for the power to control the ecological impact of intensive monoculture, slave-based plantations. Considering that conservation policies were designed to protect imperial claims to resources and grant long-term environmental security, experts argued that the state should show planters the dangers to their own survival. This very often led to policies restricting the activities of private capital. Usually those policies also mirrored moral concerns. It was common to see scientists engaging with both the environmental and social dimension of colonial projects. When climatic virtue equaled social and political virtue, experts were the first to propose alternative models of colonization.⁹

This chapter discusses what happens when we bring the encounters between people and the environment into the debate about colonial rule. Following Anna Tsing, I claim that the metaphor of friction, be it the unequal, unstable and creative qualities that come out of the interactions of different actors, humans and nonhuman, can help us better understand the conflicts that emerged from those interactions and open new ways to think about the concept of resistance.¹⁰ The literature on peoples’ different resistance strategies to colonial power has been fundamental to challenge the benevolent historical analysis of empire and to contest the depictions of the colonized as victims, stressing their agency.¹¹ Histories of São Tomé have already shown us the violent confrontations between colonizers and colonized, oppressors and oppressed, conquerors and

conquered. These have focused both on the creoles and maroon communities who resisted being integrated into the plantation system, and the ways plantation workers regularly subverted the rhythm of production, destroying tools and equipment, killing Europeans or escaping to the forest.¹² But such accounts have been centered solely in the relations between humans, individuals or groups, and have often framed those actors' agendas in neatly defined binary terms, downplaying the ambiguities that were constitutive of the colonial world.

Considering that projects aiming at attaining productivity by the simplification and standardization of both land and people were always messier and had unpredictable effects, this essay explores how that messiness got in the way of those who ruled.¹³ By showing how such human/non-human encounters were more indeterminate than what actors wanted to acknowledge—planters did not have full control over their undertakings, experts did not agree on how to organize their actions, the colonial state had to negotiate its authority—I do not aim to elude the violence of colonial power relations. On the contrary, thinking of resistance in terms of friction allows me to make colonial violence visible, but at the same time it also reveals the unstable and sometimes contingent nature of the colonial power.

For São Tomé there is still no work exploring the role of ecological factors in both making and unmaking colonial hegemony. This silence is particularly disturbing because of the centrality of the environment to the expansion of colonial projects.¹⁴ Following John McNeil's call, urging environmental historians to focus on "themes that resonate for historians in general", I believe that exploring the entanglements between nature, humans and the imperial order is one of such themes.¹⁵ As many other scholars I do think that looking at the materiality of the natural world, by approaching history "from the ground up", both literally and figuratively, by bringing into the forefront water, soils, plants, insects and fungi, can help scholars reframe master narratives about the colonial enterprise. Following the transformation of the forests of São Tomé to cocoa plantations, it is possible to address other instances that also contributed to shape the actual practices that made the empire work.

In this chapter I will not examine the arguments environmental historians have presented over the last decades, arguing for the importance of their discipline. I will take this for granted, but nevertheless some clarifications are needed. Following recent literature, I do not frame environment as an analytical category parallel to class, gender or race.¹⁶ The landscapes

that result from particular interactions of different people with particular parts of the physical and biological world in particular places is what I call nature and environment. This framework will allow me to address an important conflict between state, science and private capital triggered by a disrupted nature, bringing to light dimensions of power that otherwise remain obscured. I believe this specific episode that took place in the early twentieth-century in a peripheral Portuguese colony is a good example of how friction materializes.

AN AVALANCHE OF PESTS AND EXPERTS

Let us get back to April 909. When the colonial government in Lisbon received São Tomé planters' call, there were few doubts about how to rate it. More than coffee or cotton from Angola or Mozambique, cocoa from São Tomé amounted to almost half of the total value of Portuguese colonial exports, making it the most profitable colony of the Portuguese empire. Any menace to São Tomé's plantation system was met with great concern, as taxes on cocoa were essential for keeping the fragile colonial budget balanced.¹⁷ Until that point, labor had been the most pressing issue in the colonial agenda. The supply of a steady contingent of indentured laborers and the complicity with the violence inflicted against this population were the major dimensions of the state's political and juridical support of the plantation system.¹⁸ When planters were faced with a hidden and deceptive enemy, threatening what they perceived as a well-oiled machine, new alliances emerged.

Recognizing the sense of danger and urgency the cocoa disease presented, it took the government less than a month to send a scientific brigade to the island. In May 1909 the professors of the Agronomic Institute of Lisbon, José Joaquim de Almeida and Acrísio Canas Mendes, disembarked in São Tomé. Almeida, who had worked in the Lunda district of Angola since 1901, had firsthand knowledge of the research on cocoa done by the Germans in the Victoria Botanical Garden in the Cameroons.¹⁹ The Cameroons were a fairly new cocoa producer, but there, and contrary to the lack of state investment in colonial agronomic research in São Tomé, Germans had settled a botanical and experimental garden aimed to support local agriculture. Botanical gardens, such as the one in Victoria, were important sites for the institutionalization of science in the tropics and worked as a repository of knowledge accessible to various imperial powers.²⁰ Even in the context of inter-empire competition for resources,

which emerged after the geopolitical reconfiguration of West Africa following the Berlin Conference, cooperation between different imperial actors and institutions was a common practice. As such, it comes as no surprise that Almeida was so familiar with German research on cocoa ecology.

Almeida and Mendes spent three months visiting “all the plantations” in the island to confirm their suspicions.²¹ Phytophthora pod rot, often called pod rot, caused by a fungus of the genus *Phytophthora*, was to be blamed for the unknown disease. The fungus that penetrated the cocoa pod wall led, as the name suggests, to the fruit’s decomposition. Observations allowed them to conclude that cocoa trees in the north of the island where the old plantations stood were the most affected. Field trials measuring the rapid advancement of pod rot and Almeida’s Cameroonian experience made them recommend chemical control by spraying with copper-based mixtures. The colonial government supported those recommendations, exempting the importation of copper sulfate and lime from taxes.

As it always happened when chemical warfare was underway, it was soon followed by the assault of the fertilizers industry. In 1911, J. E. Carvalho de Almeida, a representative of the firm O. Herold & C.^a, came to São Tomé with the aim of increasing cocoa production per unit area and to preventively combat cocoa diseases, through the application of chemical fertilizers.²² After conducting soil analyses, he prescribed the use of several formulas, with different quantities of nitrogen, phosphorus and potassium—the mineral nutrients essential for cocoa growth. Carvalho de Almeida would return to São Tomé in 1912 and 1913 to measure the results of the various experiments conducted by planters. In his written reports he would present the business interests of his company not only as a benevolent scientific activity intended to help nature fulfill its task but also as a “patriotic venture”.

Patriotic maybe a more suitable word to describe state’s commitment in keeping plantations safe from fungi. After 1909 the government decided to actually organize the island’s agronomic services that existed on paper since the mid-1870s.²³ The agronomist Armando Zuzarte Cortesão was invited, in 1914, to fulfill that task. Prior to his arrival Cortesão embarked on a study mission to several colonies in the West Indies and West Africa where cocoa was grown. It seemed obvious that the disruptions of São Tomé’s local environment could only be fully understood in comparison with the global tropical south. The outbreak of the First World War

prevented him from visiting the German colony of the Cameroons. As a consequence Trinidad and Tobago became the main reference for Cortesão. There he became familiar with the conservation policies of the British colonial government.²⁴

Plantation owners also began investing heavily in scientific research to cope with this enemy of cocoa. In 1915, the Companhia Agrícola Ultramarina, one of the island's major plantation conglomerates, created a special board on plant pathology, led by the agronomist Amando Seabra, a permanent staff member of the Ministry of Agriculture, and his brother Antero Frederico Seabra, a reputed entomologist working in several Portuguese institutions. Both conducted research in São Tomé from 1916 to 1920. In that period they published no less than 30 booklets dealing with several issues related to cocoa.²⁵ Their goal was to establish the etiology of the main diseases that afflicted this plant and to indicate different strategies to combat them.

While the Seabra brothers were unveiling the neglected natural history of cocoa, Armando Cortesão wrote in the *Official Bulletin of São Tomé* on March 1918, a piece on a "new disease of the cocoa tree".²⁶ Apparently *Thrips* (*Selenothrips rubrocinctus*) was menacing the plantations. This minute insect of less than 1.5 mm in length, common to many other plants in the tropics, from mango to avocado trees, proved particularly threatening for the cocoa tree. *Thrips* nymphs, feeding on the sap of young leaves, destroyed this major organ of photosynthesis and transpiration. In a leafless tree, no fruit could grow, causing the loss of the entire culture. *Thrips* proved much more destructive than pod rot. The particularly long dry seasons of 1918, 1919 and 1920 led to its rapid progression. By the end of that period one-third of the island was affected.

When *Thrips* became the island's major public enemy, Amando and Antero Seabra concentrated their energies in killing it. Based on local field trials, along with experiments from Bahian and Trinidadian cocoa experimental stations and data coming from the United States Department of Agriculture, they advocated a strategy of chemical and biological control.²⁷ Pulverizations with a tobacco leaf extract formula and, to a lesser extent, the proliferation of some entomophagous insects natural enemies of *Thrips* were adopted by many planters on their suggestion. *Thrips* led to the major investment in the scientific research since the islands began to be cultivated. Only the challenges posed by this millimetric insect justify the avalanche of experts working for private companies that came to São Tomé after 1919.²⁸ They all supported Seabras's conclusions and approach.

MAKING SCIENTIFIC TRUTHS

However, chemical and biological warfare on *Thrips* was not undisputed. Some scientists began inquiring about the structural reasons that had allowed for the insect propagation. For the first time in the long history of São Tomé plantations, cultivation methods came under scrutiny. The initial criticism of the consequences of the uncontrolled practice of felling forests for cocoa was made by Adolfo Frederico Möller, a naturalist working for the Botanical Garden of the University of Coimbra. In the four months Möller spent in São Tomé in 1885 to study the island's flora, he corresponded with the editor of a major Portuguese agricultural journal. Besides documenting both the coercive nature and the violence of the plantations labor regime, his letters made a strong claim about the disruptive consequences of the ongoing deforestation that had permitted to put one-quarter of the island under cultivation. Möller contended that "if [planters would] carry on with this rampage (...) in fifty or sixty years the island's climate will change (...) because without forests it is impossible to have rain and humidity".²⁹

Möller was seconded by his chief: Júlio Henriques. In 1903, when Henriques first came to São Tomé, he was by far the most reputed Portuguese botanist of the time, as the Botanical Garden of the University of Coimbra occupied an important place in the international network of exchange of tropical knowledge. Henriques had, since the early 1880s, been requested by São Tomé planters to evaluate the island's natural resources, to identify species, to determine their value and the possibilities of growing them productively. As such this was not a minor voice defending the deleterious effects of deforestation. In the book published after his visit, Henriques would insist on the high costs of this practice. He claimed: "when the forest is carelessly destroyed, profound changes in the atmospheric humidity may occur, leading to rainfall decrease or loss".³⁰ The scale of the cocoa enterprise had already, according to him, brought aridity to the northern sector of the island. Similarly to what was happening in the Brazilian cocoa region of Ilhéus, he believed that the "remote and more general causes of the cocoa diseases" should be found in this deforestation process.³¹ Chevalier also linked deforestation with climatic change, arguing that in São Tomé "it seems that the cutting of the forests leads to the yearly decrease of rainfall".³² In 1921 Cortesão would make his thoughts public defending that "weather conditions of the island have changed in an extraordinary way that all those who have lived on the

island for some time agree that before it rained more often and the humidity was higher than it is now".³³

But the most eloquent supporter of the idea that *Thrips* was a mere consequence of careless deforestation was Ezequiel de Campos. However, he was a less credible expert than that of the well-established botanists and agronomists as he came from a different scientific *milieu*. In the late 1890s, this former student of the Oporto Polytechnic Academy, in the absence of other professional opportunities, decided for a job in the public works office of this peripheral colonial territory. Campos came to occupy the non-prestigious and provisional post of auxiliary engineer in the summer of 1899.

His weak social position did not deter him. Soon after his arrival he published a book entitled *Roadways of São Tomé*. This essay was much more than a list of projects for the islands' mobility. It was a violent condemnation of the Portuguese colonial endeavor.³⁴ Besides pointing at the scientific ignorance of the colonial elite, in 1902 Campos confronted the island's authorities, denouncing cases of fraud, self-enrichment and nepotism in the administration. He was soon fired, but remained in São Tomé with some interruptions until 1911, working in several plantations and again for the public administration. During his years in São Tomé, Campos fought for railways and electricity, but his interests extended beyond the common topics for any engineer. His mining training made him particularly sensitive to the exploration of natural resources and to conservation problems. Campos' arrival to the island coincided with the major clearings in the south and central areas until then covered with primary forest. In 1900 he claimed to have been "a passenger of the Noah's Ark that brought the first men and the first things to the plantations Granja and Soledad in the Angolares [in the south]". The biblical depiction was just half-truth, as the region had been inhabited by an important maroon community since the sixteenth-century. But, in part due to the maroon community, this space had until then remained outside European influence.

The close relationship between clearing the forest and the progressive change of the island's climate seemed evident to him. The scenario was painted in gloomy colors: "taking a close look at the island during the dry season, we can see how in the north the trees from the savanna came to dominate the landscape: the squat and deformed baobab, the giant and stiff silk cotton tree, both leafless. Together they remind us of an Africa of savannas, quite different from the once humid and green paradise".³⁵ Just like Henriques, Chevalier and Cortesão, Campos argued that the effects of

deforestation on climate and soils explained the boom of diseases affecting the cocoa tree and the decay in its production. He presented the progression of *Thrips* in military terms: “as the environmental biological conditions were becoming less favorable for cocoa, (...) biological conditions have become increasingly favorable to the enemies of the cacao tree, which little by little, if not abruptly, took victory”. It was impossible to put more emphasis on this narrative of crisis.

Desiccation theories that explored the relation between forest and climate, firmly established within French and British colonial forestry scientific circles in Africa, informed Portuguese experts’ judgments.³⁶ In fact, tropical aridity equaled labor as the major colonial anxiety of European imperial administrations. Recent literature has revealed the precarious character of the knowledge regarding tropical forests, and how much European colonial ideology shaped the scientific understanding of the consequences of deforestation in the tropics.³⁷ Foresters and botanists working in West Africa explained the existence of savannas as a consequence of deforestation, tacitly assuming that forest had once existed in those regions. They concluded that it had been peasant’s “destructive” shifting cultivation practices that had induced the savannization of important tracks of land.³⁸ There was an overall consensus regarding the outcome of African peasant farming and grazing activities as much as there was also an agreement concerning the effects of deforestation. Scientists working in the colonies shared the idea that deforestation led to the decrease of local rainfall, to the disruption of hydrological cycles and to the permanent degradation of soils. The loss of primary forest determined an irreversible transition from fertility to sterility. James Fairhead and Melissa Leach have shown how the belief in the redemptive power of tropical forest to alter climate became a dogma. They have also discussed how “these desiccationist ideas have long been called into question, throwing into even sharper relief the discursive nature of their truth”.³⁹ Regardless of their poor scientific bases, such ideas managed, in fact, to attain an almost global consensus. The acceptance of these theories in different colonial circles cannot be dissociated from the goals of the colonial administration. Desiccationism was the main justification for the participation of the state in the regulation of private activities.

São Tomé case complicates this familiar story. Even if on the one hand it confirms the global dimension of desiccationist theories and conservation discourses, on the other hand, it problematizes the traditional narratives on the power struggles between colonizers and colonized. In

that island, the “irrational” poor African natives were not the ecological villains. In fact, the environmentally destructive people were the “civilized” European planters. Those were the ones that, unable to cope with the harmful effects of their practices, should be stopped by the state. As such, the fight for the control over São Tomé’s environment puts into question the idea of a frictionless cooperation between the colonial state and planters.

The control over nature became a battlefield between those two important actors of the Portuguese imperial project, led by another group of protagonists: colonial experts. In 1912, Ezequiel de Campos, as deputy of the new Portuguese Republic, put forward a draft bill for the creation of forest reserves. He presented the proposal in a defiant tone: “collective agricultural wealth cannot be at the mercy of strictly particular interests”.⁴⁰ Following this line of thought, the law prohibited the clearance of central forests beyond a certain altitude, and forest patches in the hilltops of the lower regions. If planters did not comply, their lands would revert to the state without compensation. Campos’ proposal would become a national decree.⁴¹ We can just imagine that no planter abided the law, because in 1918 Armando Cortesão was still calling for state intervention to prevent the cutting of forest trees in specific areas.⁴²

Expropriations without compensation were unacceptable for estate owners and they began questioning experts’ scientific reasoning. Bernardo de Sousa Faro, the administrator of the most important plantation in the island, expressed publicly his condemnation of desiccationist theories and the associated public measures to limit the liberty of planters. Those initiatives were discredited on the basis that they represented solely professional interests: “agronomists defend their *métier* and thus advocate the conservation of every forest and even its increase if possible”. He was right when claiming that different locations and ecologies responded differently to deforestation, that the Brazilian continent could hardly be compared to the island of São Tomé and that “there was a great degree of fantasy when people imagine that there were once forests in the Sahara and if forests were restored rain would fall again”. But he was wrong when he dismissed the “assertion that the deforestation of São Tomé [was] the cause of so many cocoa diseases”.⁴³

Even if desiccationism had a wide acceptance among experts, some scientists contested that theory, seconding plantation administrators. The issue was at least a controversial one for the new head of the Agronomic services Egídio Inso. To the question “to which laws does the rain obey”,

he would prudently answer “it will take many years of observation and study to draw definite conclusions on this matter”.⁴⁴ Amando Seabra was more vocal on his criticisms, claiming: “it has been defended in São Tomé a close correlation between the natural forest and the annual precipitation. It has been thought that the trees *made* rain and that clearings were responsible for the variations in the annual rainfall. But the rainfall of São Tomé is due to its geographical location, not to evaporation” (Fig. 9.1).⁴⁵

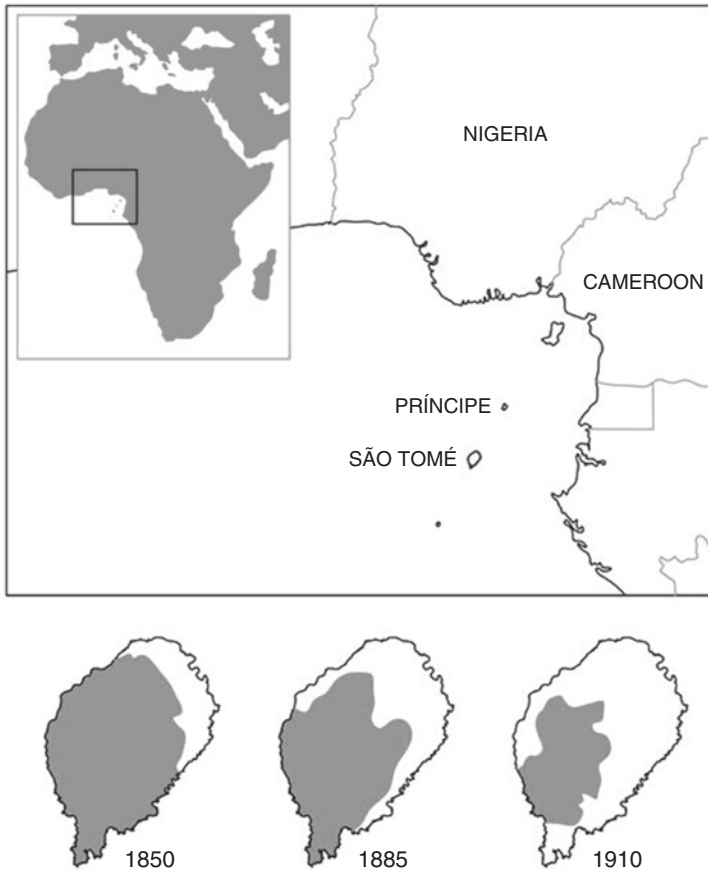


Fig. 9.1 Map of São Tomé location and deforestation progression. Map by the author

“VALORIZING” NATURE AND PEOPLE

Today there is an overall acceptance that deforestation indeed played an important role in the advancement of *Thrips*, but not because of its ability to permanently modify the island’s climate. Ecological evidence now demonstrates that *Thrips* is not a primary pest, but rather the side effect of physical and nutritional changes to the cocoa tree’s environment, capable of disturbing the tree’s normal metabolism. *Thrips* recognizes such disruption and multiplies. In São Tomé, the destruction of overhead shade trees and of protective windbreaks provided the perfect conditions for the insect. Thinning the forest and planting cocoa beneath the remaining trees was the method commonly used in São Tomé, but in the early twentieth-century the primitive forest was totally cleared and cocoa planted under new shade trees. This move led to a significant increase in cocoa production. From there until planting with no shade cover at all was a small step. Planters believed that shade plants cast a shadow on cocoa production. Eliminating shade altogether allowed for better cocoa harvests, but only during a small period of time. Excessive sun exposure disturbed the balance between water evaporation rates and rainfall, diminishing the humidity and the moisture of the soil. *Thrips* profited from those dry terrains.

Inspired by desiccationist theories, Campos defended that it was useless to combat parasites without changing the island’s environmental conditions. The phytopathological missions that he ironically called “the chemical and syringe brigades” were depicted as a mere waste of resources. Fungi and insects would continue to thrive if experts kept working “without paying attention to the rest”. The “rest” needed a comprehensive plan and a strong state to enforce it. Campos had no doubts he was the ideal man to lead this task and in the 1910s he put great expectations in the ability of the recently elected Republican government to fight planter’s interests that blocked the scientific management of natural resources. It had been similar reasoning that led him to go forward in 1911 with a law on unreclaimed land to reform the agriculture in metropolitan Portugal. Through major irrigation works, and a reforestation policy, the large properties of semiarid southern lands of Alentejo would be rendered productive. According to him, this landscape transformation would have economic, social and political consequences. Only a scientifically governed nature populated by a virtuous community of settlers, constituted by the people from the overpopulated northwestern Portugal, could serve as the material basis for the new Republican nation.⁴⁶

Campos wrote a 400 page-long manifest outlining his plan the “salvation” of São Tomé. Just like in Alentejo, *The agricultural revalorization of the island of São Tomé* depended on the conservation of natural resources—soil, water and forests—and also on the proper management of society. Following the British imperial experience in Trinidad and Tobago and the studies of American engineers that had participated in the colonization of the West,⁴⁷ the plan proposed the “correction of the environment” through scientific reforestation. Three to four million trees should be planted to function as windbreaks, to give shade to the young cocoa trees and to cover the abandoned cocoa fields. But reforestation would not suffice. The book also defended an irrigation scheme able to save the northern lands for cocoa. Armando Cortesão, who had read the same conservationist literature, would put forward a very similar plan of reforestation to “combat São Tomé’s crisis in 1923”.⁴⁸

But it was both Campos’ personal perception of the scale of the ecological disaster and his political engagement that made him go a step further. He would be the sole expert to question the maintenance of the intensive exploitation regime of the cocoa plantations and, as a consequence, the permanence of its social relations. He claimed: “No. São Tomé’s problem is not a trivial one of aligning windbreaks and planting *Erythrinas*”. Taking into consideration this complexity he would pose an endless set of questions: could “the plantations support the costs [of his plan]?—Should one proceed with a salvation strategy that will lead to ruination of planters?—Isn’t it worth to transform the island’s activity?—Will it not be better to abandon the enterprise?”⁴⁹ Campos was indeed very skeptical about the future of the plantation’s political economy. Besides the financial stress caused by the environmental degradation and the investment needed to overcome it, he was concerned about the impact of labor in this difficult equation, making the island’s cash crop economy even more vulnerable. Already in the early 1920s, São Tomé’s planters found it hard to compete with cocoa from Ghana, the new major West African cocoa producing country.

But the scientific exploration of colonial resources was also a moral issue. That is why Campos’ project for the “revalorization” of the environment had a symmetrical plan for the “valorization” of the island’s native population. Environmental disruptions coupled with the resistance of the “sons of São tome” against the Portuguese colonial project. Plantations had always been dependent on large contingents of indentured laborers from Angola and Mozambique, because the local

population and the descendants of the late nineteenth-century freedmen had refused to work on the cocoa estates. Besides not complying with the terms of the planters, these groups had generally managed to escape state control. This was the perfect moment to revert this state of affairs. With the subtleness of an agronomist he would put the problem of labor supply in such terms: “the population, in any country, is more worthy than all its natural wealth, since it is the people that gives them value”, as such, “the relation between immigrants and agriculture in São Tomé can be compared with the relation between imported fertilizers and soil fertility: uncertainty regarding the future”.⁵⁰ To abolish such uncertainty the government should put an end to “immigration” policies and promote the “fixation in the islands of the people born in them”. And by fixing Campos meant transforming the offspring of former slaves and the creoles of Portuguese-African origin into smallholders.

Building a community of virtuous African peasants had been in the legislators’ minds since the first abolitionist law of 1854. The same decree that allowed the colonial government to sell state-owned land to big planters also safeguarded the existence of public lands to be distributed and cultivated by the newly freed slaves.⁵¹ The contradictions of this dual policy were soon solved due to the economic success of the plantations. But almost a century later, the environmental consequences of São Tomé’s plantation political economy allowed for the issue to be opened to discussion again. Just like in Trinidad and Tobago, Campos defended the “obligation of every native family to own a plot of land, in the reserves specially built for them, and the obligation to cultivate it”. The state should be responsible for providing tools, seeds, credit and, of course, technical expertise. The state should also be responsible for the implementation of a “moralizing taxation” forcing the native to work the land. Campos “did not care that his opinions contradicted the general reasoning of his compatriots” because if “the plantations would not profit directly from this policy, the colony would”.⁵²

CONCLUSION

The degraded landscapes created by cocoa plantations opened the possibility to think about other colonial futures. In the 1920s it was clear that in São Tomé the domain and discipline of cocoa monoculture had not come in the form laid by planters. It was exactly the materiality of the

“contingent encounters” between planters, scientists, plants and insects, the unexpected cataclysms, the “frictions” that blocked the plantation machine, that permitted Campos to imagine new policies towards the landscape and the colonized. His alternative repertoire of colonial rule meant both a social and ecological reconfiguration: the uprooted indentured workers employed in an exploitative cash crop economy should be replaced by a different class of grounded African peasants cultivating their own land. Following Tsing, the concept of “friction”, seen not as a synonym of resistance or hegemony, serves as a metaphor to think about the malfunctions and threats to the colonial rule, its contingencies and contradictions and the responses of different social actors. The actors that emerge in this chapter are not the subaltern but rather the colonial elites confronted by (and confronting) the environment.

When we bring the environment into the discussion of how power operates in modern colonial settings, we have to examine the narratives that actors wove and told about it. Colonial nature was both a material and discursive project and so it is important to interrogate the production of knowledge about ecological matters: in which context, with what language, how it gained credibility. The scientific discourse that created the empty tropical forests ready to be appropriated as a resource producer was followed by another one that focused on desiccation and conservation. Both the standardization of the plantation landscape and the conservation programs depended on a violent simplification of complex social and ecological environments. The scientists that defended a conservationist approach, exploring the fears that deforestation and drought would lead to an economic and social breakdown, putting at risk the political existence of the colonial system itself, provided a powerful argument for state intervention. However, the long-term environmental security aimed by the state contradicted the interests of capitalists more concerned in short-term resource extraction. Considering that the most critical responses to colonial conservation policies came from planters reveals a less tidy process and a less unified portrait of colonial power.

Since the scientific and moral imperatives of conservationism caused dissent among different social actors, the colonial state had to take into account the political circumstances, the material conditions on the terrain and local power structures before implementing such policies. In São Tomé, none of Campos’ projects, neither the reforestation works nor the making of an ideal colonial society constituted by African peasants, were

put into practice. In this process both planters and the “sons of São Tomé” were able to largely keep their autonomy regarding the colonial state. Campos’ dream of a civilized community of smallholders producing cocoa, corn, beans, chickpeas, peanuts, sweet potatoes and bananas able to replace the dispossessed plantations workers would have meant a violent repression of the native population, unwilling to abandon their position as free men, and degrade themselves by engaging in manual field labor. The size of this group and the weak presence of the colonial state in the island, with a thin administrative apparatus and a negligible police and military force, blocked this initiative.⁵³ Fighting planters was different. Planters were above all major capitalists, and in the 1920s, they had already diversified their investment portfolios, stepping into other colonial ventures and even expanding their businesses beyond the area of influence of the Portuguese empire. Cocoa money had allowed them to move into industry and most importantly into high finance. Planters of São Tomé had become global economic actors, and the Portuguese imperial state was too dependent on them to confront their interests. São Tomé makes a good case to discuss how scientific discourses, such as the conservationist one, were not always associated with colonial policies.

According to Francisco Tenreiro, by the 1920s, with the end of the “cycle of the king cocoa” the long-lasting “crisis of São Tomé” began.⁵⁴ Environment played a major role in this crisis scenario. After *Thrips*, the “sudden death” of the cocoa trees caused by the fungus *Mycoleptodiscus terrestris* proved equally devastating. The islands’ productivity levels of 300 kilos of cocoa per hectare were half of those in Ghana. Cocoa exports of 36,500 tons in 1913 was never attained again. From 1920 to 1925 the island shipped about 20,000 tons, from 1926 to 1939 it oscillated between 8000 and 14,000 tons, and from 1940 until the early 1960s the island produced no more than 7000 tons. Ecological disruption was accompanied by unfavorable market conditions that led to the rise of labor costs. As anticipated by Campos, the 250,000 tons of cocoa from Ghana that flooded the market pushed the price of cocoa downward. After the crash of 1929, cocoa prices in the stock exchange were cut in half. Moreover, in São Tomé, labor costs remained high. Even if salaries constituted a relatively small part of the plantations budget, planters had to pay for recruitment and repatriation, for the expensive network of control and surveillance, for food, for shelter and for medical assistance. This investment was not compensated by the low productivity of poorly fed and exhausted workers, not to mention the money lost due to death or escape.⁵⁵

This chapter aimed at discussing the power struggles that emerged from the disrupted landscapes of São Tomé cocoa plantations. It has shown how a scientific discourse on the environmental costs of deforestation was created, how conservation plans were put forward and how the state was persuaded to “rationally” manage this colonial territory. It also made evident that those discourses and plans were not free of conflict. Conflicts emerged among experts, between experts and planters, between experts and the native population and between all of those actors and the state. In São Tomé, this last actor proved unable to fight the interests of these different social groups. Plantations languished over the years until São Tomé’s independence, in 1975, and disappeared after that. If in the 1910s only a small portion of the original 900 square kilometers of tropical forest remained untouched, forest trees gradually took possession of the territory, covering the abandoned cocoa fields.

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NOTES

1. See Kevin Grant, *A Civilised Savagery: Britain and the New Slaveries in Africa, 1884–1926* (New York: Routledge, 2005), chapter 4 and Miguel Bandeira Jerónimo, *The “Civilizing Mission” of Portuguese Colonialism, 1870–1930* (Basingstoke: Palgrave Macmillan, 2015), part I.
2. “Acta do Centro Colonial no. 91, 22 de Abril de 1909”, *Boletim do Centro Colonial de Lisboa*, 1, no. 2 (May 1909), 17. This bulletin was part of the lobbying strategy of Portuguese cocoa planters.
3. Gerhard Seibert, “São Tomé and Príncipe: The First Plantation Economy in the Tropics”, in Robin Law, Suzanne Schwarz and Silke Strickrodt (eds.), *Commercial Agriculture, the Slave Trade and Slavery in Atlantic Africa* (Woodbridge, Suffolk: James Currey, 2013), pp. 54–78.
4. On the history of São Tomé see: Pablo B. Eyzaguirre, “Small Farmers and Estates in São Tomé, West Africa” (PhD diss., Yale University, 1986); Tony Hodges and Malyn Newitt, *São Tomé and Príncipe: From Plantation Colony to Microstate* (Boulder, CO: Westview Press, 1988); Augusto Nascimento, “S. Tomé na segunda metade de oitocentos: nascimento de

- uma sociedade colonial” (Master diss., Faculdade de Ciências Sociais e Humanas, Universidade Nova de Lisboa, 1992); Augusto Nascimento, *Poderes e Quotidiano nas roças de S. Tomé e Príncipe: De finais de oitocentos a meados de novecentos* (Lousã: Tipografia Lousanense, 2002); Marta Macedo, “Standard Cocoa: Transnational Networks and Technoscientific Regimes in West African Plantations”, *Technology and Culture*, 57, no. 3 (2016).
5. Antonio de Almada Negreiros, *Les colonies portugaises; études documentaires sur les possessions portugaise et leurs produits d’exportation: Exposition Coloniale de Paris 1906* (Paris: A. Challamel, 1906), p. 93.
 6. Auguste Chevalier, *Le cacaoyer dans l’Ouest africain* (Paris: A. Challamel, 1908), p. 24.
 7. Geraldo A. Lorenzino, “Linguistic, Historical and Ethnographic Evidence on the Formation of the Angolares, A Maroon-Descendant Community in Sao Tome (West Africa)”, *Portuguese Studies Review*, 15, no. 1–2 (2007); Gerhard Seibert, “Castaways, Autochthons, or Maroons? The Debate on the Angolares of São Tomé Island”, in Philip J. Havik and Malyn Newitt (ed.), *Creole Societies in the Portuguese Colonial Empire* (Newcastle upon Tyne: Cambridge Scholars Publishing, 2015).
 8. Richard H. Grove, *Green Imperialism: Colonial Expansion, Tropical Island Edens and the Origins of Environmentalism, 1600–1860* (Cambridge: Cambridge University Press, 1996) and Richard H. Grove, *Ecology, Climate and Empire: Colonialism and Global Environmental History, 1400–1940* (Cambridge: The White Horse Press, 1997).
 9. Helen Tilley, *Africa as a Living Laboratory: Empire, Development, and the Problem of Scientific Knowledge, 1870–1950* (Chicago: University of Chicago Press, 2011).
 10. Anna Lowenhaupt Tsing, *Friction: An Ethnography of Global Connection* (Princeton and Oxford: Princeton University Press, 2005). The creative collaborations between humans and nonhumans in damaged landscapes are also the subject addressed in Anna Lowenhaupt Tsing, *The Mushroom at the End of the World: On the Possibility of Life in Capitalist Ruins* (Princeton and Oxford: Princeton University Press, 2015).
 11. The literature on resistance to different forms of European colonial domination and exploitations is immense. See for instance: Allen Isaacman, *The Tradition of Resistance in Mozambique: Anti-Colonial Activity in the Zambezi Valley, 1850–1921* (London: Heinemann, 1976); Terence Ranger, *The African Voice in Southern Rhodesia, 1898–1930* (London: Heinemann, 1970); James C. Scott, *Weapons of the Weak: Everyday Forms of Peasant Resistance* (New Haven: Yale University Press, 1985).
 12. Nascimento, “S. Tomé na segunda metade de oitocentos”; Nascimento, *Poderes e quotidiano nas roças de S. Tomé e Príncipe*.

13. James C. Scott, *Seeing like a State: How Certain Schemes to Improve the Human Condition have Failed* (New Haven: Yale University Press, 1998).
14. Grove, *Ecology, Climate and Empire*.
15. John R. McNeill, "Future Research Needs in Environmental History: Region, Eras, and Themes", in Kimberley Coulter and Christof Mauch (eds.), *The Futures of Environmental History: Needs and Opportunities* (Munich: Rachel Carson Center, 2011), p. 15.
16. Ellen Stroud, "Does Nature Always Matter? Following Dirt through History", *History and Theory*, 42, no. 4, Theme Issue: Environment and History (2003).
17. Pedro Lains, "Causas do colonialismo português em África, 1822–1975", *Análise social*, 33, no. 146–147 (1998), 482.
18. Jerónimo, *The "civilizing mission"*.
19. José Joaquim de Almeida, "Relatório da vista ao Jardim Botânico de Vitória (Camarões)", *Revista Agronómica*, 6, no. 4–11 (1906).
20. Christophe Bonneuil, "Crafting and Disciplining the Tropics: Plant Science in the French Colonies", in John Krige and Dominique Preste (eds.), *Companion to Science in the Twentieth Century* (London: Routledge, 2003).
21. José Joaquim de Almeida and Acrísio Canas Mendes, *Les plus graves maladies du cacaoyer à S. Tomé* (Lisboa: Imprimerie "A Editora", 1910).
22. J. E. Carvalho de Almeida, *Impressões de uma viagem à ilha de S. Tomé: a constituição dos terrenos e as vantagens das adubações químicas* (Lisboa: Tipografia M. Correia dos Santos, 1911).
23. On March 7, 1876 the colonial government issued a law established the position of an agronomist in each oversee province of the Portuguese Empire.
24. Armando Cortesão, "Relatório de uma missão às Índias Ocidentais I", *Revista Agronómica*, 11, no. 21–24 (1915) and Armando Cortesão, "Relatório de uma missão às Índias Ocidentais II", *Revista Agronómica*, 12, no. 25–36 (1916).
25. Armando de Seabra and Antero Frederico Seabra, *As doenças das plantações de cacau das ilhas de S. Tomé e Príncipe: os serviços técnicos de combate contra as epifitias*, Companhia Agrícola Ultramarina, Secção Técnica e de Patologia Vegetal (Lisboa: Tipografia da Empresa Diário de Notícias, 1921). For a complete list of the publications see pages 137–139.
26. Armando Cortesão, "Uma nova doença dos cacaueiros em São Tomé", *Boletim Oficial de São Tomé e Príncipe*, no. 19 (March 11, 1918), 233.
27. Amando de Seabra, *Estudos sobre as doenças e parasitas do cacaueiro e de outras plantas cultivadas em S. Thomé. XVIII. A moléstia nova dos Cacaueiros na Ilha de São Tomé* (Lisboa: Tipografia Empresa do Diário de Notícias, 1919); Amando de Seabra, *Estudos sobre as doenças e parasitas do cacaueiro e de outras plantas cultivadas em S. Thomé. XIX. A seca dos ramos dos cacau-*

- eiros* (Lisboa: Tipografia Empresa do Diário de Notícias, 1919); Antero Frederico Seabra, *Études sur les maladies et les parasites du cacaoyer et d'autres plantes cultivées à S. Thomé. VII. Quelques observations sur le "Thrips" du cacaoyer* (Lisbonne: Société Portugaise des Sciences Naturelles, 1919); Antero Frederico Seabra, *Études sur les maladies et les parasites du cacaoyer et d'autres plantes cultivées à S. Thomé. XVI. Note préliminaire sur la Maladie des Cacaoyers connue à S. Thomé sous la désignation de "Seca dos ramos"* (Lisbonne: Imprimerie de l' Empresa Diario de Noticias, Lisbonne, 1921); Antero Frederico Seabra, *Études sur les maladies et les parasites du Cacaoyer et d'autres plantes cultivées à S. Thomé. XXX. Encore le Thrips du Cacaoyer (Heliothrips rubrocinctus (Giard)) à S. Thomé* (Lisbonne: Imprimerie de l' Empresa Diario de Noticias, Lisbonne, 1920).
28. In the first months of 1919 the consortium Sociedade Portuguesa de Emigração sponsored the mission of Henry Navel and Martinho da França Pereira Coutinho. Pereira Coutinho would return to the island in the first trimester of 1920, accompanied by Manuel Soura da Câmara, this time working for the Companhia da Ilha do Príncipe. Frederick William Urich, entomologist of the Agricultural Department of Trinidad e Tobago, visited São Tomé in September 1920 invited by the Sociedade Agrícola Vale Flor, Lda.
 29. Adolfo Frederico Möller, "Exploração botânica nas possessões portuguesas: São Tomé, Roça Nova Moka, 23 de Junho de 1885", *Jornal de Horticultura Prática*, 16 (1885), 199.
 30. Júlio Henriques, *A ilha de S. Tomé sob o ponto de vista histórico-natural e agrícola* (Coimbra: Imprensa da Universidade de Coimbra, 1917), p. 72.
 31. Júlio Henriques, "As derrubadas e a cultura do cacaueiro", *Boletim Oficial de São Tomé e Príncipe*, no. 9 (March 2, 1918), 111.
 32. Chevalier, *Le cacaoyer*, p. 26.
 33. Armando Cortesão, *Culture du cacaoyer: la crise actuelle de la colonie portugaise de S. Tomé e Príncipe* (Lisbonne: Ministère des Colonies, 1921), p. 13.
 34. Ezequiel de Campos, *Viação de São Tomé: apontamentos* (Porto: Livraria Nacional e Estrangeira de Eduardo Tavares Martins, 1904).
 35. Ezequiel de Campos, *A revalorização agrícola da ilha de São Tomé: subsídios para a política colonial* (Vila Nova de Famalicão: Tipografia Minerva, 1921), pp. 51 and 75.
 36. Grove, *Ecology, Climate and Empire*.
 37. Lucy Jarosz, "Defining Deforestation in Madagascar", in Richard Peet and Michael Watts (eds.), *Liberation Ecologies: Environment, Development, Social Movements* (London and New York: Routledge, 1996).
 38. James Fairhead, "Development Discourse and Its Subversion: Decivilization, Depolitization and dispossession in West Africa", in Alberto Arce and Norman Long (eds.), *Anthropology, Development and Modernity:*

- Exploring Discourses, Counter-tendencies and Violence* (London and New York: Routledge, 2000), p. 109.
39. James Fairhead and Melissa Leach, “Desiccation and Domination: Science and Struggles over Environment and Development in Colonial Guinea”, *The Journal of African History*, 41, no. 1 (2000), 38.
 40. Ezequiel de Campos, *Obras Públicas de São Tomé: plano de melhoramentos locais, projectos de leis* (Lisboa: Livraria Ferin, 1912), p. 270.
 41. “Decreto de 30 de Setembro de 1912, proibindo a desarborização em determinados terrenos da Ilha de São Tomé”, *Boletim Oficial de São Tomé e Príncipe*, no. 45 (November 2, 1912).
 42. Armando Cortesão, “Sobre as derrubadas em São Tomé”, *Boletim Oficial de São Tomé e Príncipe*, no. 11 (March 16, 1918).
 43. Bernardo de Sousa e Faro, “Sobre as derrubadas em São Tomé”, *Boletim Oficial de São Tomé e Príncipe*, no. 17 (April 27, 1918), 200 and 201.
 44. Egídio Inso, *As ilhas de S. Tomé e Príncipe: terras de Pedro Escobar e João Santarem* (São Tomé: Imprensa Nacional de São Tomé, 1922), pp. 97 and 98.
 45. Seabra and Seabra, *As doenças das plantações*, p. 27.
 46. Tiago Saraiva, “Laboratories and Landscapes: The Fascist New State and the Colonization of Portugal and Mozambique”, *Journal of History of Science and Technology*, 3 (2009), http://www.johost.eu/vol3_fall_2009/vol3_ts2.htm.
 47. Campos, *A revalorização agrícola*.
 48. Cortesão, *Culture du cacaoyer*.
 49. Campos, *A revalorização agrícola*, p. 302.
 50. Campos, *A revalorização agrícola*, p. 333.
 51. In December 14, 1854, the government issued a decree ordering the registration of all slaves living in the Portuguese colonial territories and creating the category of *libertos* (freed people). Just five days after, in December 19, 1854, another decree was put forward regulating the sell of state-owned properties in the island of São Tomé, *Boletim do Conselho Ultramarino: legislação novíssima*, vol. 2, 1852–1856 (Lisboa: Imprensa Nacional, 1869).
 52. Campos, *A revalorização agrícola*, pp. 339–341.
 53. See chapters 4 and 5 of Nascimento, “S. Tomé na segunda metade de oitocentos”.
 54. Francisco Tenreiro, *A ilha de São Tomé* (Lisboa: Junta de Investigações do Ultramar, 1961), pp. 220–233.
 55. Even if in the 1930s the colonial government put forward an individual tax forcing the natives to work they resisted participating in the plantation economy. In the 1950s labor amounted to almost 70% of the total production costs compared to the 30% in Ghana.