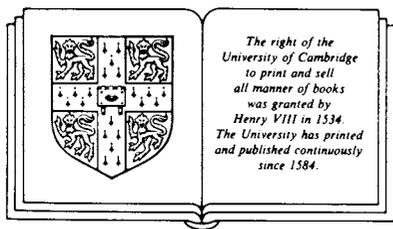


Brazil and the struggle for rubber

*A study in
environmental history*

WARREN DEAN

*Department of History
New York University*



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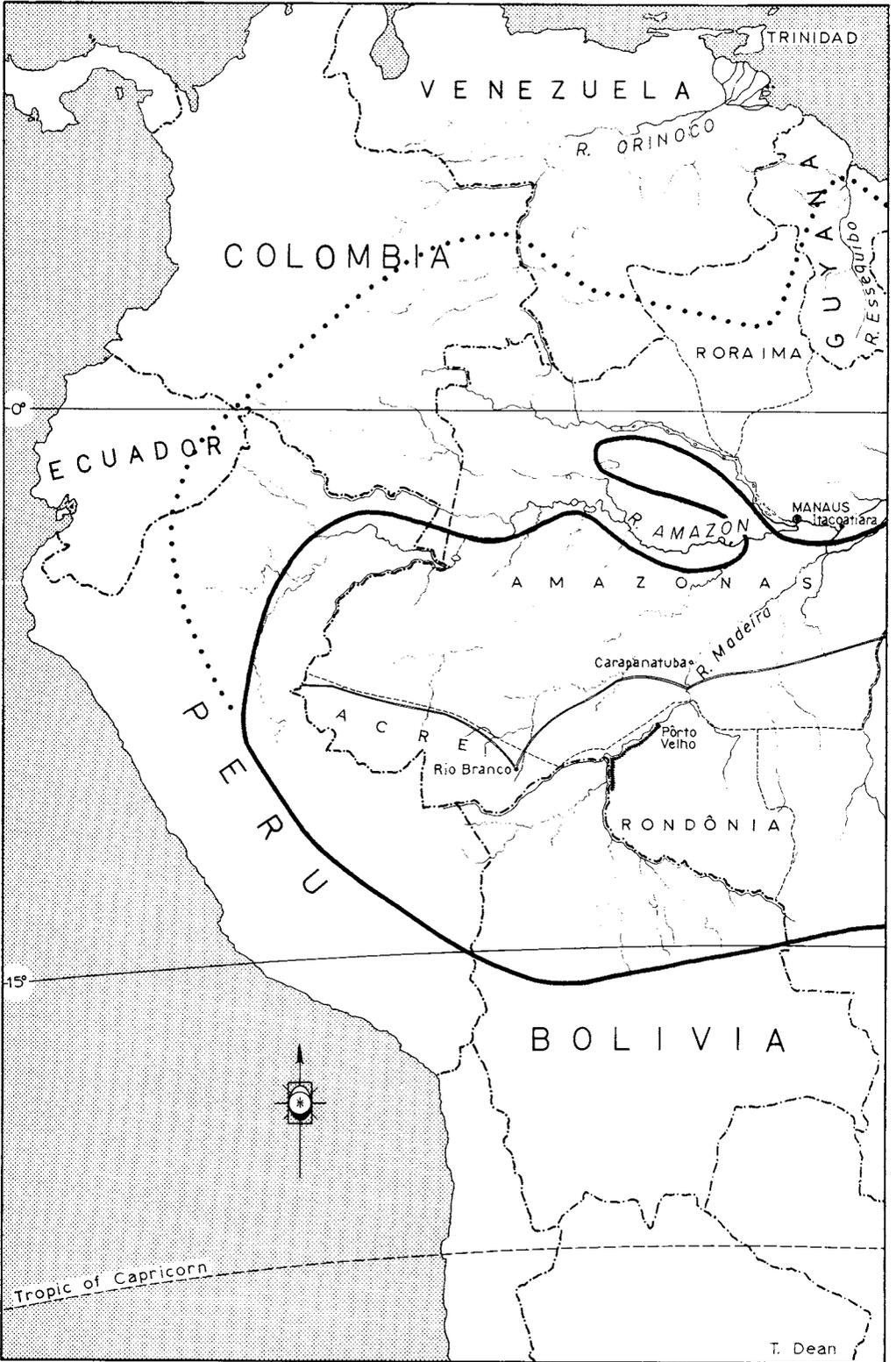
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Introduction

The domestication of plants is one of humankind's most consequential achievements. Plant cultivation was the technique that multiplied human numbers, launched civilization, and for better or worse established human dominion over nature. Domestication, in prehistoric times a gradual and partly accidental process of selection and hybridization, gradually expanded and stabilized food and raw material supplies of the human population. The exchange of seeds and plant materials, along with relevant techniques, was certainly one of the most important forms of cultural diffusion. Thus, for example, maize passed from the Tamaulipas region of Mexico in which it was hybridized to places as remote as Massachusetts and Paraguay, at least a millennium before the Europeans arrived in the New World.

The voyages of Columbus marked the beginning of a deliberate and wholesale transfer of domesticates, of great importance for the steady growth of human numbers, for the expansion of world commerce, and for the spread of European imperialism. Thus, for example, did sugar cane, brought from the Mediterranean and the Atlantic islands to Brazil and the Caribbean, provide a growing supply of carbohydrate to the inhabitants of the north temperate zone, while engendering a ghastly trade in kidnapped African labor and the phenomenon of industrialized yet politically retrograde plantation colonies.¹

At the same time that Europeans were expanding their agriculture through the selection of new cultivars and of more propitious locations for their cultivation, they were also interfering ever more aggressively with relations among plants and their parasites and pests. These changes, although inadvertant and unnoticed, were nevertheless also historical events, inextricable from the social and political changes that succeeded the introduction of the new cultivars. The transfer, for example, of the potato to northern Europe from its central Andean hearth was followed, at an interval of less than two centuries, by the transfer – or “invasion,” as such events are denominated by aggrieved human onlookers – of *Phytophthora infestans*, the potato blight, with catastrophic consequences for European populations from the Shannon to the Volga.²



KEY: 0 100 200 300 400 500 Miles
 0 200 400 600 800 Kilometers

1:20,000,000

- Limit of the habitat of *Hevea brasiliensis*
- Limit of the Genus *Hevea*
- Trans-Amazon Highway
- Railway



Introduction

By the nineteenth century, the transfer of exotic plants and the search for wild plants that might be domesticated were activities that were becoming rationalized and organized and put at the service of industrial capitalism. Collectors were sent from Europe to the farthest reaches of the earth in search of unknown species that might serve as raw material, remedy, or ornament. This enterprise, even though it was the expression of scientific and state bureaucracies, nevertheless partook of romance: It was a quest for the rare, the precious, and the danger-scented.

Of all the great feats of that era of botanical discovery, none was more imposing than that of the domestication of rubber. New World inhabitants had shown rubber, which they obtained from several tropical plant species, to early explorers, including Columbus. Since it was an unstable product, it remained for more than three centuries a mere curiosity. Then, in 1839, it was found that through treatment with sulphur and heat, rubber's elastic properties could be made more permanent. Its applications multiplied and the exploitation of many wild rubber-bearing plants, including some that were soon discovered in Asia and Africa, was much intensified.

It happened that the wild tree that yielded the purest and most elastic rubber, and also most abundantly, was native to the Amazon basin. Known as *Para rubber* in commerce, it soon became the object of an immense and unwieldy trading system that stretched from Belém, at the river's mouth, 3,000 kilometers into the interior of the world's largest and densest tropical forest. The rubber trade became a mainstay of the Brazilian economy, providing at its height almost 40 percent of its export revenues, nearly equaling coffee in importance.

It was not long before the idea was conceived of domesticating rubber. The project involved many complex problems: The botanical identification of the wild plants from which rubber was obtained, the collection of information about their growing conditions and the manner in which they were tapped in the wild, the organization of expeditions to collect plant materials and acclimatize them in advantageous locations, and, finally, the undertaking of experimental programs to determine optimal techniques of cultivation and exploitation. All these questions were resolved, and plantation-grown rubber entered the world market at the beginning of the twentieth century.

But Brazil was not the site of the successful commercialization of rubber. Rubber cultivation was, instead, transferred to Southeast Asia. Malaya, Ceylon, Sumatra, Java, and Cochin China became immense fields of investment, binding those colonies more straitly to their imperial metropolises. Soon abundant and cheap, rubber was put to thousands of uses. Its reduced cost was an important factor in the emergence of a mass market for automobiles; from two-thirds to three-quarters of the demand for rubber soon came from the makers of tires and tubes for motor vehicles.

Meanwhile, Brazil, the original and major supplier of wild rubber, suffered

disaster. Its economic growth diminished and its vast Amazon region relapsed into stagnation and despair. Few modern events demonstrate as well the interrelatedness of human affairs. Ever since, Brazil has struggled impatiently at a task that has continued to elude it: to install in its own territory the rational cultivation of the plant of which it was so long ago despoiled.

These events, though dimmed by time, were not without consequences for the present and for the foreseeable future. Despite the invention of synthetic elastomers, natural rubber, still indispensable for certain industrial purposes, has continued to maintain nearly a third of the world market. The colonial planters and governors long ago departed their tropical domains, but they left behind a resource of immense value that the newly independent states have ceaselessly tried to improve. And other tropical countries, notably India and China as well as Brazil, anxious to supply their expanding industries with raw materials domestically produced, yet poorly endowed with the crude oil that is necessary to manufacture synthetic elastomers, have intensified their development of rubber plantations. In Africa the Ivory Coast, like Liberia before it, has tried to develop rubber as a major export crop.

This study attempts to view the history of rubber cultivation in a global context, while concentrating upon the Brazilian struggle. It sets out to answer the questions that Brazilians have repeatedly put to themselves. Only a little empathy is required to realize that the first question must necessarily be: How was the Brazilian rubber monopoly lost? The answer, pursued in Chapters 1 and 2, is important to an understanding of the ecological relationship that provides the thesis of this study, and it shatters a myth that has survived into the present, distorting comprehension and deflecting effective action.

The next, inevitable question is: Why did the Brazilians not take up rubber cultivation themselves in response to the Southeast Asian threat? The answer, as will be demonstrated, is that they did, but not successfully. Numerous explanations have been offered to account for this failure. When a system such as an agricultural regime fails, many interrelating weaknesses may be seen to have some influence on the outcome. The essential problem, however, is usually identifiable as that which remains even when the others are rectified. Rubber cultivation in Brazil suffered in different places and times from shortages of labor, capital, and technique. But even when these difficulties were overcome, rubber trees were too low-yielding to justify their costs. Essentially, as rubber specialists are well aware, the problem is ecological. There is a certain plant fungus that attacks the rubber tree within its native range. Up to now, adequate and economical defenses against the fungus have not been devised. The revelation of these historical realities are to be found in Chapters 3 and 4.

The next question that literate and distracted Brazilians have pondered has been: How could it be that the United States, which poured capital and technique into rubber planting in Brazil for more than twenty years, failed to

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achieve success (and, by implication, if the rich and powerful Americans failed, how could they, the Brazilians, succeed on their own)? The story of the Ford Amazon plantations and wartime efforts to develop rubber supplies in the Amazon is therefore detailed in Chapters 5 and 6. These chapters offer abundant confirmation of the thesis put forward in Chapter 4, but perhaps none for the thesis that the United States was inherently better equipped to develop the Amazon.

Finally, the Brazilians in recent years asked how it could be, with all the technical competence that their country was developing in agricultural research, and with all the success that it was experiencing in the cultivation of other newly introduced crops – even in the Amazon, supposedly hostile to any form of commercial agriculture – that rubber persisted in refusing to grow! This paradox was so much more painful since Brazil was industrializing and had urgent, even desperate need for rubber as a raw material in its own factories. Chapters 7, 8, and 9 deal with the evolution of Brazilian rubber research and development in the postwar period up to the present. It is a costly, anguished, and conflict-ridden tale that has, let the reader be forewarned, no happy ending.

This account of the Brazilian struggle to cultivate rubber has a purpose beyond its relevance to the economic history of a single country or a single commodity. It is hoped that this study has implications for the historical understanding of agricultural regimes in general. In particular, historical accounts of tropical plantation agriculture seem customarily to be written as though the subject of study were an industrial rather than a biological process, and as though the ecological conditions of production were unimportant to historical outcomes. More broadly still, this account is designed to be a contribution to the field of environmental history, which the author sees as a kind of cultural history that analyzes the capacity of our species, under differing circumstances, to understand and manage its relationships with its natural environment. It is hoped that to some degree, this study represents a contribution to those understandings and relationships themselves.