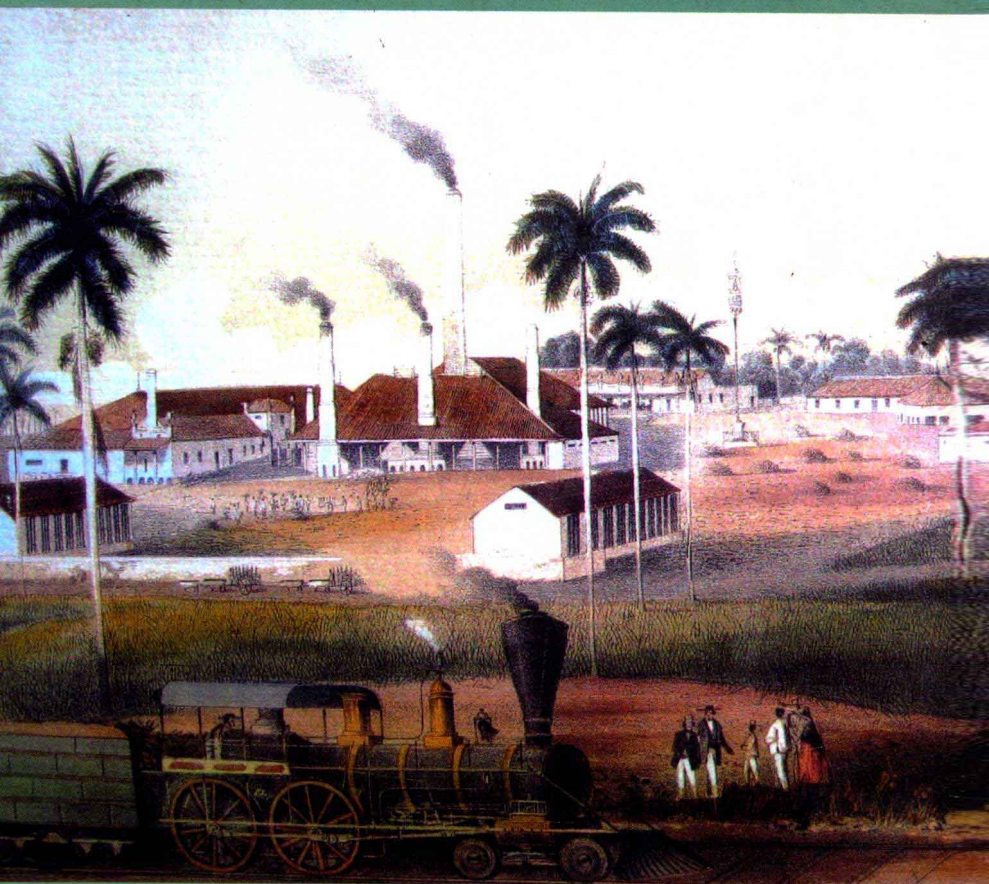
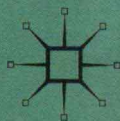


CUBAN SUGAR INDUSTRY

Transnational Networks and Engineering Migrants
in Mid-Nineteenth Century Cuba



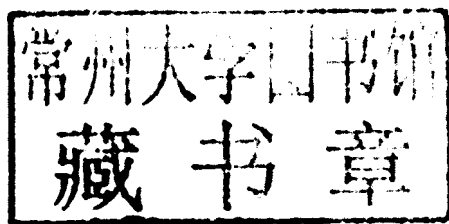
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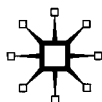
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CUBAN SUGAR INDUSTRY

*In memory of those
who remain present in their absence
loved and missed*

*Gale Curry
creator, believer
refuge in a crazy world
and above all mother*

*Murray Benham
poet, philosopher
fighter for a better world
and above all friend*

PREFACE

In the summer of 2002, I passed the entrance of the former “Soledad” sugar plantation, owned by the North American Edwin Atkins. What used to be in the vanguard of research into cane cultivation has now become a botanic garden. But by the roadside, like a monument to the sugar production out of which Atkins built his wealth, stands one of the estate’s mid-nineteenth-century cane mills. Though this particular piece of machinery is no longer functioning, and the decaying remains of sugar estates can still be stumbled upon throughout Cuba, this was more than just a reminder of the past. Sugar, which rose to dominance in the island in the nineteenth century, continues to be an inescapable part of the Cuban reality, and the machinery has not all been left to rust. Later in the same year came the 165th anniversary of the Cuban rail system. While mid-nineteenth-century locomotives are unlikely to be found outside of a museum, many of those still used for the hauling of cane are steam engines, constructed over eighty years ago.¹

Just as the engines and mills stand forgotten, so too are the migrant workers who were their original operators. Moreno Fraginals, in his pioneering work on the Cuban sugar industry, dismisses them as “relatively anonymous,” though giving “the mill a certain exotic tinge since they were nearly always foreigners”²; and their presence in the island has become relegated, at best, to passing references: historical footnotes, forgotten in the midst of the large-scale migrations, and social, political, and economic upheavals of the era.³ This book seeks to uncover the history of the engineers who traveled to Cuba to work the newly imported steam-driven machinery employed in the sugar plantations, railways, mines, and foundries of the mid-nineteenth century. Although numerically dwarfed by the far larger migrant groups of free and coerced migrants who went to form the Cuban nation, they had an importance in the island’s history beyond simply being operators of steam engines: influential in technological developments, not just in Cuba itself, but internationally, their example contributes to our understanding of the dynamics by which industrial advances are enabled by the contributions of the workers themselves. Through

their presence in Cuba, they also acted as catalytic agents in the social and political developments of the period—and on occasions served the purpose of “privileged scapegoats.”⁵⁴ Their case study enables an understanding of the complex ways in which migrants interact with a host society, are changed by the experience, and themselves influence their new surroundings.

Far from all being members of a clearly defined trade, the engineers who arrived in Cuba came from an industrial milieu that brought together “Engineers, Machinists, Millwrights, Smiths, and Pattern Makers,”⁵⁵ the boundaries between which were far from clear and were shifting as the period progressed. Contemporary Cuban and Spanish records tended to use, fairly indiscriminately, the terms *maquinista*, *ingeniero*, and *mecánico* to describe artisans who may have ranged greatly in the level of skill that they possessed, and the attachment they felt to a broader working-class identity. Throughout this book I use “*maquinista*” to collectively talk of a group of migrants who may have individually described themselves in any one of the aforementioned ways. This word, in its mid-nineteenth-century Cuban usage, was quite inclusive, and popularly employed to refer to a wide range of engineering workers, from locomotive drivers and simple machine operators, to highly skilled engineers engaged in design and construction. The literal English equivalent, “machinist,” lacks this scope in meaning, since there was a far clearer distinction between machinists and engineers in the period. Since many of the *maquinistas* aspired to a higher status, and even succeeded in becoming inventors in their own right, it seemed most appropriate to use a term that in Cuba would have applied to them at all stages of their career.

Any attempt to clearly define a historical period is inevitably somewhat arbitrary. However, in order to set some bounds I have focused on the period running from 1837 to 1868. Although there were steam engines and migrant *maquinistas* in the island prior to the opening of the first Cuban railroad in 1837, it was from around this date that their presence began to be felt. This was the period in which sugar rose to unchallenged dominance within the Cuban economy, and the first technological revolution in sugar production occurred. The first Cuban war of independence, which began in 1868, brought significant structural changes in the sugar industry, and so it made sense to limit the research to the period prior to this. Nevertheless the lines I draw are not absolute, and, where relevant, material has been used from earlier and later sources.

I have many people to thank for making the writing of this book possible, and for giving me support and encouragement along the

path toward its completion. If it had not been for Jean Stubbs, I many never have embarked on it. It was thanks to her that my initial research notes are not still gathering dust, and that I took seriously the possibility of taking that research further. Her own work on Cuban history and society, its complexities, and its place in a regional and, ultimately, global context inspired me in the development of my own research. I would also like to thank other colleagues at the Caribbean Studies Centre (London Metropolitan University), in particular Clem Secharan, whose work on sugar-related migration and the recovery of the lives of those forgotten by history continues to inspire. While in Cuba, I was taken under the wings of the “Juan Marinello” Institute, and thank Pablo Pacheco, Georgina Geronés, Ana Vera Estrada, and Elena Socarrás in particular. Thanks, too, to the staff of the many archives and libraries in Britain, Cuba, and Spain, where I have had the privilege of spending time turning over documentary stones; and to the Arts and Humanities Research Board, who made it financially possible for me to embark on this project.

Special thanks to Humberto García, who, as well as sharing an interest in the history of engineering and engineers, provided me with material relating to one of the most prominent North American *maquinistas* in Cuba—Ezra Dod. Sharron Schwartz unselfishly shared with me a great deal of material relating to the mines at El Cobre, and the Cornish miners who traveled there to work. Jorge Macle generously provided me with digital reproductions of a number of plans, maps, and other material from the collections of the Cuban National Archives; and Pedro Pérez Sarduy continues to keep his eye open for material relating to Cuban steam engines and locomotives. A number of fellow researchers have provided me with assistance and encouragement in various ways over the years, and deserve special mention: James Dunkerley, Oliver Marshall, Nancy Naro, Gad Heuman, David Murray, Joan Casanovas, Luis Martínez-Fernández, Jonathan Hyslop, Ileana Sanz, Tony Kapcia, and the list could easily be extended. More recently, the intellectual stimulation provided by the Commodities of Empire network and those involved in it—particularly Sandip Hazareesingh—has been invaluable.

I have been particularly fortunate in benefiting from conversations with and criticisms from a number of scholars: Manuel Barcia, Mary Chamberlain, Denis Judd, and Jorge Giovannetti—who, ever since we first met in Havana, has continually provided me with his excellent company (when we have managed to coincide geographically) and has openly shared with me his ideas, constructively critical reading of my work, and suggestions. Thanks also to Vladimir Smith, who in 1992

first suggested I embark on the research that has led to this book; and to all my friends in Cuba, without whom I would never have felt that I belonged (migrant though I was), and my distance from whom is a continual ache.

My father, David Curry—whose experience as an engineer from a long line of engineers, while not rubbing off on me in practical terms, clearly influenced me in researching the *maquinistas*, and whose own research into nineteenth-century sugar machinery has developed in tandem to my own—continues to help clarify the practicalities of sugar manufacture, and much of what appears here on innovations in the industry has come out of our conversations. Great though the help and support that I have received from others over the years has been, they are overshadowed by the daily love and strength that I have been given by Eldimarys. Ever since we first fortuitously, flirtatiously, and fatefully met in Havana, she has filled me with energy, stretched my horizons, and given me the faith I needed to work on and complete this research. She has also given me something infinitely more valuable, a creative work that no amount of writing could match: our son, Ashleigh Johann, my little wanderer who was conceived, born, and has grown so fast in the time that it has taken me to research and write this book.

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Introduction

Succumbing to Cane

When Christopher Columbus first reached Cuba, he found an island that was strikingly different from that of today:

It was covered with trees...and these were lovely and green and different from ours, and each bore its own fruit or flowers. There were many birds, large and small, which sung sweetly, and there were a great number of palms...The vegetation was as abundant as in April and May in Andalusia.¹

It has been estimated that 95 percent of Cuba's land surface was covered by forests at the time of the Spanish conquest.² Most of the Caribbean islands were similar in this respect; however, while many others suffered rapid deforestation following European settlement, most of Cuba's forests remained relatively intact three centuries after Columbus's first visit. This was partly because Cuba was much larger than the other islands, so it could readily absorb a considerably higher level of human settlement before this would have the significant and devastating ecological impact it had on the Lesser Antilles. But an important difference was that while sugarcane quickly came to dominate these other islands—bringing on the necessity of clearing land for plantations, and of burning wood as fuel in the mills—cane cultivation remained limited in Cuba until the end of the eighteenth century.³

But as the global demand for sugar grew, and as the ascendancy of other sugar producers waned, Cuba succumbed to the temptation, and by the mid-nineteenth century the island was firmly in cane's grip. Fernando Ortiz characterized Cuban history as a counterpoint between tobacco—representing indigenous identity—and sugar—representing “the struggle originated by the introduction of foreign capital and its overwhelming influence on the island's economy.”⁴ Although during the nineteenth century Cuba's tobacco industry

obtained the fame that continues to make the Havana cigar a globally recognized symbol of the island's identity,⁵ this and other crops became overshadowed by the seemingly inexorable spread of sugar; and though parts of the island remained characterized by the gentler impact of diversified agriculture, it was the advance of the sugar-plantation frontier, with its monotonous *cañaverales*—from the center of which could be seen rising a plume of smoke to mark where the mill ground the cane and crystallized the sugar—that increasingly dominated both Cuba's landscape and economy.

GLOBAL COMMODITY

The turn to large-scale cane cultivation was largely motivated by the needs of foreign markets. Unlike tobacco—the Cuban trade in which was initially stimulated by the demands of the Spanish market, with the Spanish Crown exerting a strict monopoly throughout the eighteenth century—the growth in Cuban sugar occurred in the midst of the progressive liberalization by Spain of Cuba's trading relations; and it was primarily the pressures of the Cuban sugar producers that forced such reforms upon the Spanish. Cuban planters were motivated chiefly by the need to participate in the developing global networks of transnational, transimperial trade and consumption; and they were facilitated in the development of their agriculture and industry by the participation of a transnational array of merchants, bankers, and skilled workers—in particular, the *maquinistas*.

The Atlantic nations that clashed, whether as imperial powers or as independence-claiming colonies, came into being “within a multinational network and within an international trading system.”⁶ From the seventeenth century onward, products manufactured in Europe and North America were traded in Africa for slaves, which were in turn exchanged in the New World colonies for a variety of tropical commodities for sale in the growing metropolitan markets. This “triangular trade” formed the foundations of the interdependent Atlantic world, in turn stimulating the industrialization that revolutionized production first in Britain, and subsequently in continental Europe and North America, and with it the development of the machinery that gave further impetus to the colonial plantation economies, turning them into “vast agrarian factories.”⁷

The processes and movements involved in this were not limited to the Atlantic, but were globalizing in their effect, and were arguably the continuation of a tendency toward expansion and global interconnection, present since the start of human civilization as “a

thread running through all of humanity's past."⁸ Growing human population, expanding technological capacity, and increasing interaction between peoples "worked collectively like a triple helix to reinforce one another with powerful effects throughout history."⁹ A new period of globalization emerged from the sixteenth century—a period that brought "the reconfiguration of state systems, and the growth of finance, services and pre-industrial manufacturing," not just by European powers as they extended their reach from the Americas to the Far East, but also in Africa and Asia.¹⁰ Philip Curtin has argued that maritime trade has long been the primary sector of commercial growth in the world economy, and this was an important feature of this period, through the agency of networks of "diasporic merchants."¹¹ These played an important role in the development of plantations, where key tradable commodities were produced; in the shipping of this produce both to local and regional consumers, and back to the metropolitan markets; and in the acquisition and trade of slaves to work in the plantations. Up until the eighteenth century, the imperial powers attempted to maintain close and jealous control over their respective colonies and the produce and trade emanating from these. However, despite these officially asserted monopolistic mercantile policies, the trade networks were ever succeeding in slipping beneath attempted control, with contraband and privateering playing just as important a role as formal markets.

In the nineteenth century maritime trade continued to be an underlying organizing principle of the "Atlantic world." However, although European and North American powers sought to tighten their influence and control over the Caribbean, Latin America, and Africa, at the same time the informal trade networks that had previously slowly developed despite the official mercantile monopolies were now given free rein. By the time the slave trade became outlawed in the early nineteenth century, while political tensions were defining lines of power and influence, these same lines were being broken down by the commercial networks established by a transnational web of merchants. By the mid-nineteenth century this had become transformed into networks of economic penetration and domination by metropolitan powers, through the agency of the increasingly powerful merchant banks that provided the investment necessary for the continuing, and extending, development of production. The principal object of their trading endeavors, and the reason for the ready availability of the capital necessary for the development of production, was to channel the various commodities—agricultural and mineral, raw or manufactured—the

global movement of which was tying the world into an ever tighter interdependency.¹²

The networks that such commodities were moved through were a complex combination of capital, trade, skills, and technology, as well as the related human movement and settlement (whether free or enslaved) required for their production and distribution.¹³ Although these spread in the context of competing empires, they were already in many ways transnational, transimperial, even globalized in scope. Empire was by no means irrelevant in this, but it is necessary to look beneath the formal, politically and militarily contested boundaries of imperial power, to the interlacing networks whose spread was facilitated by the global spread of European powers from the sixteenth century. These networks themselves provided the empires with a means and a reason for extension, and contested hegemony over them was a cause for imperial conflict. But the global networks—whether commercial, social, technological, or cultural—also went beyond the formal bounds of empire, extending across such lines through informal interconnections, often closely related to the movement of commodities.

Foremost among the commodities that emanated from the Caribbean since the second half of the seventeenth century, and from Cuba in particular during the nineteenth, was sugar. Evidence of sugarcane cultivation and its use as an energy source has been found from as early as 10,000 BC in north-eastern India and 6,000 BC in the South Pacific. It subsequently spread through the Indian subcontinent and into China. However, it was not until the Indians found a way of crystallizing sugar around 350 AD that it could be manufactured into a readily tradable form, and it began to be exported along their growing international trade routes. During the agricultural revolution (eighth to thirteenth century), Arabs extended sugar production throughout their lands, being the first to engage in its large-scale production using plantations and mills. As a result, sugar consumption spread throughout the Mediterranean; and with the development of improved presses in the 1390s, plantations spread to parts of the southern Iberian Peninsula, and by the 1420s to the Macronesian Atlantic islands (Canaries, Madeira, and Azores).¹⁴

Although cane cultivation developed slowly in the Spanish American colonies—whose colonists were initially more concerned with mining precious metals than growing crops—by the mid-sixteenth century the Portuguese had introduced sugarcane to Brazil, and the industry quickly developed there.¹⁵ In the early-to-mid seventeenth century, Dutch traders helped spread cane to the newly settled English and

French colonies in the Lesser Antilles, with Barbados in particular rapidly becoming dominated by sugar production. By the eighteenth century, sugar, along with cotton, had become fundamental in the definition of the Atlantic world and its interlacing networks, and it played an important part in the transfer of wealth to Western Europe, where it helped fund and feed the industrious, and later industrial, revolutions.

During much of its history, sugar was considered a luxury commodity; but by the nineteenth century, its consumption had become popularized, and it formed an increasingly central part of the working-class diets of Europe and North America. "The importance of sugar cannot be overrated," a member of the Royal Society of Arts commented in 1866, "when we consider the enormous increase of this dietetic article all over the world."¹⁶ By the 1860s, more than forty-two pounds per person were consumed annually in Great Britain, forty times more than at the beginning of the eighteenth century.¹⁷ This proletarianization of sugar, begun in Britain to overcome the shortfalls of the working-class diet, subsequently extended globally, helping "to fill the calorie gap of the laboring poor" and becoming "one of the first foods of the industrial work break."¹⁸

Long before the nineteenth century, sugar had become a global commodity. However, until the nineteenth century (when large-scale production was developed in the East Indies, in particular Java), it was primarily in the Americas that it was produced on a mass industrial scale. Nevertheless, sugar was already reaching every part of the globe, and had become an intrinsic part of the diets of most peoples, through the already transnationalized, globalized networks of human contact and communication.¹⁹ From the sixteenth century onward, its production in the New World was resulting in mass intercontinental migration—much of this enslaved. The spread of its cultivation in the Caribbean in the seventeenth and eighteenth centuries helped to fund imperial adventures on the other side of the planet; and the growing demand for its consumption among the burgeoning populations of the world turned it into one of the foremost global commodities, stimulating the spread of European-led trading networks.

RISE OF CUBAN SUGAR

In 1493, Christopher Columbus brought a sugarcane sample with him from Gomera in the Canary Islands, planting it on Hispaniola (present-day Dominican Republic and Haiti). However, despite some early attempts at establishing its commercial cultivation—with the

first molasses mill in the Americas established in Concepción de la Vega, Hispaniola, in 1503—there was little initial success. This was owing to a number of reasons: the use of outmoded and inefficient milling technology, the absence of sufficient workers, and the difficulty of access to suitable markets.²⁰ But this began to change after 1515, with the exhaustion of the available gold on the island and the arrival after 1510 of Dominican friars, who saw in the cultivation of commercial crops a potential means of stabilizing the region.

Sugarcane is a crop that is particularly well-suited to the Caribbean climate, and the variety cultivated by the Spanish in the Antilles (as well as the Portuguese in Brazil, and later the French and English in the Lesser Antilles)—*Saccharum officinarum*—proved to be relatively free from pests and diseases. In the first half of the sixteenth century, the market for sugar was also growing in Europe, with rising sugar prices. This led Gonzales de Velloso to establish the Caribbean's first successful sugar plantation and mill, close to Santo Domingo, having imported from the Canary Islands (where the sugar industry was already established) an improved mill and the necessary technical staff. De Velloso had to contend with the same problems that would continue to plague sugar production (despite its apparent success) over the coming centuries: the need for technical expertise; rapid transport of the cane to the mill; a large workforce; an appropriate source of energy (which, prior to the introduction of steam technology in the nineteenth century, meant either running water or animals); sufficient wood to feed the mill's furnaces; and a significant amount of capital, both to set up and to maintain. Nevertheless, despite these difficulties, the cultivation of sugarcane slowly spread along Hispaniola's southern coast, and in a few districts in Puerto Rico. Most of the financing for this came from the proceeds of earlier gold prospecting, and also the trade in indigenous slaves.²¹

Sugarcane probably reached Cuba in 1511, following the expedition by Diego Valásquez to establish a Spanish colony on the island. Growth of cane cultivation, however, was slow and principally concentrated in the region surrounding Havana, which proved particularly favorable, and also in the vicinity of Bayamo and Santiago de Cuba in the east. In 1523, the Spanish emperor Charles V offered a grant of four thousand gold pesos for the setting up of sugar mills by settlers in Cuba; however, such mills as were established were small. Even when larger mills began to come into operation in 1576, "these mills were simple, crude constructions of rollers for crushing the cane moved by cattle or water power. The product obtained by simple boiling in open pans was of a very inferior quality, and was consumed