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During the 1930s, episodes of violent protest by the inhabitants of Britain's Caribbean colonies brought the extremely poor living and working conditions that existed in these territories to domestic and international attention. Revelations of widespread unemployment, squalid housing and malnutrition threatened the moral authority of British rule and provided fuel for critics of British imperialism. As a result, Britain made a commitment to improving living conditions in an area of the British Empire that it had previously neglected. This book explores the function of knowledge and expertise in the visions of economic development that were subsequently produced for the region, with a focus on the debate about encouraging new industry. Historians have often said that Britain was unwilling to sanction the growth of manufacturing in the Colonial Empire in order to protect markets for British industrial exports.¹ In fact, officials in London saw the development of secondary manufacturing in the Caribbean as essential after the Great Depression in order to raise living standards and contain political dissent. Colonial Office plans included a vision of economic development that gave a key role to scientific research. The Colonial Office was inspired by recent discoveries such as nylon, polythene and penicillin to sponsor laboratory research that would transform sugar from a low-value foodstuff into a starting compound for the expanding chemical and fermentation industries. The expectation was that new factories producing the constituents of plastics, drugs and fuels from sugar would be established in the Caribbean itself. In this vision of industrialisation, state-funded research would enable Britain's Caribbean colonies to participate in the emerging 'brave new synthetic world', and in doing so these places would find their economic fortunes revived.²

By exploring post-war visions of economic development for the British Caribbean colonies this work produces a rethinking of our wider understanding of the history of science and development in the twentieth century. Despite the rise of development as a universal ideal for the Global South and the emergence of development studies as a major scholarly field, we employ a narrative of past projects that can be partial and even erroneous in its claims. By the 1950s, the priority for most governments, academics and agencies concerned with the advancement of low-income countries was identifying the necessary incentives for industrialisation. In exploring the inspiration for such measures, scholars have focused on models provided by economists such as W. Arthur Lewis, Raul Prebisch and W. W. Rostow.³ In contrast, this account shows how ideas about industrial development were worked out in a period before the advent of famous theoretical interventions such as modernisation theory. It describes how the late colonial Caribbean was a laboratory for the emergence of new ideas about the development of manufacturing and shows how initiatives on the ground could in fact contribute to later theoretical work; a rather different relationship between theory and practice from that typically described.

This account also broadens our understanding of development by focusing on a region that has been overlooked in historical studies. The riots in Britain's Caribbean colonies during the 1930s persuaded the British government to greatly increase development spending across the Colonial Empire after 1940 in an attempt to improve conditions and mollify critics of British imperialism.⁴ The focus in scholarship that explores the results of this turn to development has been on Africa, however, so that we know very little of the plans formulated for Britain's Caribbean colonies after 1940, despite the significance of the region for producing new policy in the first place. Importantly, this exploration of Britain's economic plans for the West Indies shows them to be of a very different character from the state-centred, rational and authoritarian agricultural schemes in Africa that historians have often presented as typical of development projects in the post-war period.⁵ In British development plans for the Caribbean the political utility of science and expert action stemmed from their capacity to reconcile new development ambitions with long-standing *laissez-faire* principles favoured by the Colonial Office. In the case of research into sugar, laboratory investigations represented a mode of state intervention that struck an acceptable balance between government action and private interests. The argument that is made here is that while the late colonial period was a high-water mark for state-led development in Britain's colonies, a time when there was unprecedented emphasis on

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science and much talk of planning, the vision of British West Indian economic development employed by the Colonial Office was essentially liberal in character.

Aside from providing a resolution to a central issue in the political economy of industrial development, knowledge and expert advice also became increasingly important to the maintenance of Britain's control over its colonial possessions after 1945. The exceptional level of funding for scientific research made available through the 1940 Colonial Development and Welfare (CDW) Act and its successors was an important gesture to ward off domestic and international criticism of Britain's management of its colonies after the disturbances of the 1930s. In-depth research to establish the basic facts about tropical locations was said to ensure that Britain's development interventions were effective in the future, thus helping to restore the credibility of British imperial rule. Apart from this, the forty new laboratories created across the Colonial Empire after the Second World War were said to endow Britain's colonies with the ability to participate in the international advance of science, and therefore to operate as modern states. Science and scientists took on unprecedented importance for the British Colonial Office after 1940, both in providing solutions to practical issues that arose from the drive for development and also in demonstrating the enduring value of British interventions in the tropics and Britain's commitment to modernising its colonial possessions.

The provision of knowledge and advice was also an important strategy for the maintenance of British influence over Caribbean affairs at a time when these colonies were undergoing a process of constitutional reform that appointed local politicians to colonial legislatures in greater numbers. While the Colonial Office had clear preferences with regard to the way industrialisation should proceed in the British West Indies, responsibility for working out the details of policies for industrial development did not reside with officials in London but instead lay with the increasingly autonomous governments of the region. With the decline of direct modes of metropolitan control, Britain came to rely on the activities of scientists and expert advisors to maintain its standing with its Caribbean colonies. The idea that development projects had a key role in demonstrating the benefits of continued association with Britain was challenged, however, by the desire of the USA for a larger presence in the Caribbean area. The promotion of industrial development became part of America's strategy to promote its economic and strategic interests in the region. Britain's authority was threatened by an influx of experts disseminating development ideas that diverged significantly from those of the Colonial Office.

The co-existence of different models for development in the late colonial period helps problematise the notion that, when it came to the plans of governments and new inter-governmental agencies such as the World Health Organization, one particular paradigm of development was dominant after 1945.⁶ By broadening the scope of analysis beyond agriculture to include industry, and considering Caribbean as well as African locations, we find that rather than comprising a hegemonic set of discourses and practices that privileged planning and state intervention, there was diversity in development visions in the 1940s and 1950s, and Caribbean political leaders were presented with initiatives to promote economic development that varied considerably according to their source. One aim here is to disturb the universalising tendency in some accounts of development in the past by paying far greater attention to the relationship between official development visions and the economic and political priorities of different groups of policy makers. In other words, this work aims to put politics back into our understanding of development after 1940 by showing how state-produced definitions and visions of development could contain expressions of very different roles for government and for science, and how these proposals were contingent upon the wider political and economic beliefs, ambitions and needs of those that hoped to shape the development of the Caribbean and ensure their place in its future.

Science, development and empire

It is not uncommon for scholars to claim the birth of development occurred in the post-war period, often marked by President Truman's Inaugural Address of 1949.⁷ This assertion can come as a surprise to historians who have looked at the increasing focus on development in the European empires from the late nineteenth century. Historians of British imperialism have described how science was firmly implicated in the rise of colonial development as a goal of imperial policy, beginning around 1895, when Joseph Chamberlain was appointed Secretary of State for the Colonies. Michael Worboys and Joseph Hodge in particular have shown that the reformulation of 'improvement' as the goal of imperial policy to 'development' was marked by new state provision for transport, communications and science in the colonies, promoted as necessary measures to encourage business in the fullest exploitation of Britain's tropical possessions.⁸ Scientific interventions were expected to help unlock the unrealised potential of the tropics. In the early twentieth century, new agricultural departments were created across the Colonial Empire and institutions for tropical medicine, entomology and the assessment of tropical products were established in Britain by

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the outbreak of the First World War. Funds for initiatives in health and agriculture before 1940 came from a series of acts, including the 1929 Colonial Development Act that had the wider purpose of alleviating unemployment in Britain by stimulating demand for capital goods in the colonies.⁹ The drive to increase agricultural efficiency and open up territories for greater exploitation led to an expansion in scientific and medical officers in Britain's colonies, and these officers worked to exert control over tropical environments and subject populations, through projects to control tsetse and sleeping sickness, for example.¹⁰ By the interwar period, the belief had arisen that African peoples mismanaged their land, and so experts were deployed not just to increase outputs but also to protect the environment from the apparent pressures of over-cultivation.¹¹

The British government made its most concerted attempt to develop its tropical possessions after 1940. This late colonial push for development occurred alongside American and United Nations technical assistance programmes. Little work considers the interchanges that occurred between different governments and institutions with development ambitions.¹² Not only, then, does the concept of development have a history that pre-dates the Second World War, the period between 1940 and 1965 saw a more complex array of imperial, trans-imperial and international formations orientated towards development than many accounts describe.¹³ This book moves from an investigation of the Colonial Office vision of Caribbean industrial development, with its focus on scientific research, to examination of debates that occurred at meetings of the US-led Caribbean Commission and in the British colony of Trinidad. It examines how ideas emerged, and circulated, at the metropolitan, regional and colonial level, and explores the significance of interactions between British and US officials and Caribbean intellectuals and politicians in shaping development thinking and practices. In doing so, it shows how an influx of foreign expertise that promoted a Caribbean-wide approach to development threatened imperial integrity in the late colonial Caribbean and disturbed British expectations of a close relationship with the British West Indies after independence.

The account of British economic development plans for the Caribbean presented here reveals a conception of state-conceived development that does not conform to the picture often presented in the literature. Historical studies of development after 1945 have often drawn on the work of James Scott and James Ferguson with a focus on large-scale agricultural projects that aimed to transform rural Africa.¹⁴ In this scholarship, rural development schemes are described as comprising a regime. Development represents an all-encompassing form of

state power – authoritarian, intrusive and dealing in standardised and regimented units of production. For many scholars, the exemplar of the development project of the twentieth century is the large-scale African agrarian scheme in which communities were uprooted, resettled in new villages and made to work on uniform plots under close supervision, as in the Gezira cotton-growing project in British-controlled Sudan, the Sukumaland Scheme in Tanganyika, or, for some historians, the Groundnut Scheme.¹⁵ A number of accounts have sought to show how attempts to control subject populations through development projects were often limited in practice by the incompetence of officials and shortages of personnel and funding.¹⁶ In addition, colonised people resisted official development visions on the ground.¹⁷ What is missing, however, is the notion that governments could promote other modes of development apart from those that relied upon centralised state direction and a willingness to intervene in people's lives in order to completely remake existing patterns of living and working.

In contrast to this prevailing picture of state-led development, this book shows that the British vision of industrial development for the Caribbean was cautious about affording too large a role to the state, was financially conservative and embodied a preference for change that officials described as 'naturally occurring'. Scientific research, specifically 'fundamental research', had a function in producing interventions that conformed to this *laissez-faire* vision of Caribbean development. The fact that the Colonial Office favoured a rather different approach to encouraging the industrial development of the Caribbean in comparison to agricultural development in rural Africa is hardly surprising. In contrast to the African colonies, which were spoken of in terms of unexploited potential, the British West Indies were perceived as a region in decline, plagued by the problems of modern industrial society – slums, unemployment and labour unrest. Africa was a place where agricultural production was often still the mainstay of colonial economies and, in addition, increases in outputs of tropical products were expected to make a contribution to solving Britain's own economic problems after 1947. The creation of new industry in the Caribbean did not have the same economic value for Britain as increases in dollar-earning agricultural products and therefore it was not promoted through intensive and intrusive models of development. The intention here, however, is to raise questions about what we consider to be typical of development in the twentieth century and to suggest that state-produced development visions were more varied and contingent than our existing literature allows.

In exploring the relationship between science and industrial development, this book focuses on one particular group of scientific

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practitioners: research scientists who worked in a British or colonial laboratory. The aim is to explore the importance attached to scientific researchers, as a sub-group of experts, for Britain's development effort after 1940. The CDW Acts privileged scientific research, providing a substantial fund of £1 million each year from 1945 entirely for the promotion of this activity across the Colonial Empire. To put this into context, the Research Fund of the CDW Acts made the Colonial Office the second-largest funder of civil scientific research in Britain during the 1940s, with more money than the Medical Research Council (MRC) or Agricultural Research Council (ARC). The result of this focus on promoting research was the creation of over forty colonial laboratories and research institutions in Britain's colonies. Scientific advisors to the Colonial Office expended a great deal of effort differentiating between the in-depth study of colonial problems that would occur in these new centres and other types of technical work such as preparing vaccines, clearing bush to tackle tsetse fly or directing African farmers to plant new crops. The distinction between 'research', often 'fundamental research', and 'problem solving', 'routine tasks' or 'extension work' was extremely important. The claim that was made was that highly qualified scientific researchers, those that would normally work in a British university or research unit, would only work in the colonial services if they were given assurance that they would have the freedom to choose their own research problems comparable to the freedom they were said to enjoy at home. Arrangements for colonial research, therefore, needed to ensure autonomy for scientists, and it was accepted at the Colonial Office that this condition was key to the professional status of scientific researchers. The notion that research required particular working conditions, different from those of other grades of scientific or medical staff, provided a rationale for the particular apparatus introduced for colonial research across the Colonial Empire after 1940.

Recognising that emphasis on research led to changes in the arrangements for colonial science prompts a rethinking of the story of science and development in the mid twentieth century. This book is a study of the relationship between scientific research and colonial development that pays close attention to the distinct position of scientific researchers with respect to the technical services and colonial administrations, and in doing so attempts to problematise our understandings of expertise in a new way. The increasing authority claimed by experts working in the colonies in the first half of the twentieth century has been the subject of a great deal of critical comment. Scholars have spoken of a belief in the innate superiority of Western science that led to the marginalisation of local knowledge, and the

imposition of unsuitable schemes on communities who did not want them but had to suffer the social and ecological consequences.¹⁸ More recent work has shown that expert understandings of African environments and societies could in fact vary a great deal.¹⁹ Some officers deployed in Africa took a keen interest in indigenous farming practices, for example.²⁰ Helen Tilley, Peder Anker and Joseph Hodge have shown that concern about the failure of previous development initiatives, interest in tropical soils, and the rise of ecology and anthropology contributed to increasingly sophisticated understandings of African environments during the interwar period.²¹ Suzanne Moon and Donna Mehos have argued that we should not conflate the itinerant consultants working for international development institutions in the post-independence era with the scientific staff of the European empires that had spent lengthy periods in one location and gained much place-based knowledge.²²

Despite the production of increasingly nuanced accounts of expertise, existing scholarship has not paid much attention to the distinctions that existed between roles in the technical services in the British colonies. This is not an argument for seeing the diversity of views held by scientific officers in the colonies but instead for greater engagement with the fact that technical officers were members of highly stratified services in which distinctions on the basis of qualifications and professional status were very important. Different grades of officer were involved in very different types of interactions with colonial peoples and the colonial state. Non-specialist members of the Colonial Agricultural Service, for example, often with basic and general qualifications from agricultural colleges in Britain, were typically at the forefront of executing large-scale development projects that involved soil terracing or the adoption of particular methods of animal husbandry. In contrast, laboratory researchers who had specialist degrees in chemistry from places like Cambridge University studied colonial products in research institutes where they had very little regular contact with local people apart from those they employed. These researchers did not spend so much time out in the field, and were not routinely engaged in the direct manipulation of the economic and social practices of local communities in the name of improvement. Instead their work contributed to the exercise of colonial power through the production of representations of the tropics and colonised peoples; representations that were often informed by the economic priorities and racial prejudices of the imperial/colonial state. Recognising the differences that existed between research staff and extension officers in terms of their relationships with both the metropolis and colonial peoples suggests that we need to move beyond talk of colonial science

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or a single science–development relationship to see that science could function as part of the colonial project in various ways. Apart from anything else, this raises questions about the circulation of knowledge at the level of the colony. It is not at all clear how ideas generated by elite researchers in colonial institutions were conveyed to technical staff in the field when these individuals did not attend the same meetings, read the same journals, or even exchange annual reports.²³ The focus in this book is on a group of organic chemists and microbiologists who studied tropical products in British and colonial laboratories, with funds from the CDW Acts. These individuals were highly qualified research scientists of a type who had not been employed in the Colonial Empire in great numbers before 1940. The aim here is to establish the specific place of laboratory investigations prosecuted by these individuals in the project of colonial development after 1940, or in other words, to elaborate a research–development relationship that should not be conflated with the relationships that scholars have mapped out for other groups of technical officers.

The other argument about science and empire that runs through this book is that we can only understand the function of scientific research in the late colonial period if we pay serious attention to earlier developments in science in Britain. The architects of arrangements in the colonies were explicit that their goal was the extension of the system of research that had emerged at home to the empire as whole. Most important were the arrangements for scientific research that operated in Britain through the research council system that included the Department of Scientific and Industrial Research (DSIR), the MRC and the ARC. The research council system provided both a template for research arrangements for the colonies and also a discourse on the nature of research itself. There was little specifically colonial about the conception of research that was promoted for Britain's colonies. The obstacles to good research were presented as much the same whether an institute was in Trinidad or East Anglia. The chief goal was to ensure research workers were placed under scientific oversight to ensure they had the necessary freedom to pursue their own investigations. By removing close supervision by non-scientists or less-qualified technical staff, this arrangement worked to assure the status of the research councils as the true arbiters of research funded by the British state.

This exploration of the apparatus introduced to cultivate colonial research pays particular attention to the rhetorical value of the term 'fundamental research' in shaping new arrangements for research in Britain's colonies. Work on the research councils in Britain has sometimes assumed that when these bodies referred to their preference for 'fundamental research', this can be read as a synonym for 'pure

science', a term that usually referred to investigations that were driven by the curiosity of the researcher without thought of application.²⁴ A tendency to conflate 'fundamental research' with 'pure science' has obscured rather than illuminated important features of research council rhetoric, however, both in relation to the domestic ambitions of these bodies and to their work at the Colonial Office. It does not help us, for example, answer the question as to why officials at the Colonial Office were persuaded that Britain's colonies needed an expansion of 'fundamental research' after 1940 if this only served to remove their control and place research at some distance from practice. The answer to the question of why officials were happy to endorse an emphasis on 'fundamental research' lies in the fact that this term was one with flexibility of meaning, encompassing more than just the notion of science for its own sake. For officials at the Colonial Office, the promotion of scientific research had both utility and symbolic power, endowing their work with greater credibility and reflecting a new conception of the scope and purpose of imperial action. For the scientists who advised the office, particular characterisations of research and research workers allowed the introduction of their preferred working conditions. The multiple connotations of 'fundamental research' were important in building a consensus between scientific advisors and officials about the direction of policy during the 1940s. This consensus began to break down, however, in the 1950s, and this book will end with a consideration of the reasons for this eventual fracturing of that earlier vision of the relationship between scientific research and colonial development.

From policy-making to practice

This account considers some of the outcomes for the Caribbean of the substantial increase in funding for development and scientific research that occurred with the passing of the CDW Act of 1940. Historians have focused on the novelty of the CDW Acts in providing grants rather than loans for the development of the colonies and a commitment to programmes concerned with social improvement for the first time.²⁵ This assumption of greater responsibility for providing schools, hospitals and sanitation schemes is said to have stemmed from a need to demonstrate Britain's commitment to the principle of trusteeship in order to counter both Germany's demands for the restitution of its former colonies and hostile anti-imperial rhetoric from the USA after revelations of high levels of deprivation in Britain's possessions during the 1930s.

The period after 1940 was not, of course, one of imperial expansion. By 1948, Britain had relinquished formal control in India,

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Ceylon and Palestine. India and the Dominions were dealt with by the Commonwealth Relations Office from 1947 and did not receive any part of the new CDW allocation. The loss of some former territories did not represent an overall trend of gradually diminishing British influence in the years after the Second World War, however. In 1948, the Colonial Empire consisted of a variety of colonies, mandates and protectorates. The British colonies in Africa were divided into three main areas: West Africa included the colonies of Nigeria, Sierra Leone, the Gambia and the Gold Coast; East Africa included Kenya, Uganda, Tanganyika and Zanzibar; and Central Africa was made up of Northern Rhodesia and Nyasaland. The remaining British territories in Africa were Somaliland, Bechuanaland, Swaziland and Basutoland (the white settlers of Southern Rhodesia had declared their independence from Britain in 1923). The British West Indies comprised the Bahamas, Barbados, British Guiana, British Honduras, Jamaica, Trinidad and Tobago, the Leeward Islands of Antigua, Montserrat, St Christopher, Nevis, the Virgin Islands, and the Windward Islands of Dominica, Grenada, St Lucia and St Vincent.²⁶ The net effect of the new development ethos that emerged in the 1940s, coupled with policies intended to cultivate political change, was to give officials at the Colonial Office a reinvigorated sense of purpose.²⁷ The objective was the maintenance of the remaining Colonial Empire rather than its dissolution. In the years immediately after the passing of the 1940 CDW Act, development was presented as a progressive measure, one that did not prioritise metropolitan needs over colonial ones. A second definition came to the fore after Britain's economic crisis of 1947, however, in which development meant a focus on increasing colonial production, and British possessions were once again expected to work for the benefit of Britain in the first instance. British colonial policy and practice after 1940 was therefore a combination of idealism and exploitation.

In the wake of the 1940 CDW Act, the Colonial Office made a commitment to the development of secondary industry in the Caribbean. L. J. Butler remains the only historian to have considered in any detail the Colonial Office's policy for industrialisation.²⁸ His focus was on the drive for import-substitution industries in West Africa and no account exists of plans for the British Caribbean. Indeed, historians of the Caribbean generally deny that Britain ever had such a vision. The existing literature tells us that when Trinidad and Jamaica created legislation to encourage industrial development after 1949, this was the result of an intervention made by the famous St Lucian economist W. A. Lewis.²⁹ That story does not stand up well to scrutiny, and this account shows that in the case of Trinidad, an economic advisor from London was key in shaping the new legislation so that in its first

incarnation, the incentives provided for industry were closer to the preferences of the Colonial Office.

Britain's Caribbean colonies were some of the oldest territories of the Colonial Empire, with Barbados coming into British possession in 1627. Barbados was the only colony in the region to be entirely in British hands throughout the colonial period. The others variously passed through French, Dutch and Spanish control before the Napoleonic Wars. Trinidad became a British colony in 1802, and like many of the other Caribbean territories, the legacy of French and Spanish influence is apparent in the language and culture of the people. The populations of the Caribbean are diverse; along with the large numbers of people who trace their origins to Africa, a system of indentureship brought workers from East India to Trinidad and British Guiana in the nineteenth century, and communities exist across the region from places as far apart as China, Syria and South Africa. In terms of economics, until the end of the eighteenth century, a Caribbean sugar industry dependent on the labour of African slaves provided many Britons with the opportunity for profit. By the twentieth century, however, the problems of British West Indies seemed intractable. The legacy of the plantation system included an over-reliance on sugar as an export, a shortage of land for independent farmers and local food production, and limited investment in new industries. Caribbean economies were reliant on a very narrow base of exports, a problem exacerbated by economic depression and war (Table 1 shows the main exports of the British West Indian colonies in 1947). Population densities were very high in some islands such as Barbados (see Table 2), contributing to an acute shortage of adequate employment and also, in some cases, a shortage of land for peasant proprietors. Many people sought work elsewhere when times were hard, either moving to another island, such as Trinidad, where a workforce was needed for the oil industry from the early twentieth century, or further afield to the USA and Central America to build the Panama Canal.

During the Great Depression, prices for primary commodities went into steep decline and the structural problems of the British West Indies were fully exposed. Workers could not find sufficient income in struggling agricultural industries to cover the high costs of food imports, and the Caribbean colonies did not produce enough food to feed themselves. Government finances worsened with the declining value of exports and rising costs of essential imports such as rice and flour so that at the moment when Caribbean peoples were

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Table 1 Principal exports of the British Caribbean colonies in 1947
(*British Dependencies in the Caribbean and North Atlantic, 1939-1952*,
Cmd 8575).

<i>Exports</i>	<i>Quantity</i>	<i>Value (£000 sterling)</i>
Antigua		
Sugar	18,000 tons	419
Cotton	84,000 lbs	9
Bahamas		
Craw fish	415 tons	58
Tomatoes	53,000 bushels	46
Salt	2,033,000 bushels	66
Barbados		
Sugar	82,461 tons	1,879
Molasses	7,887,000 gallons	1,147
Rum	1,462,000 gallons	9
British Guiana		
Rice	19,625 tons	478
Bauxite	1,290,000 tons	1,402
Sugar	185,000 tons	3,974
British Honduras		
Gum, chicle	634 tons	328
Wood and timber	1,041,000 cubic foot	538
Grapefruit juice	2,652 tons	104
Dominica		
Lime juice	347,000 gallons	37
Essential oils	54,000 gallons	39
Cocoa	210 tons	33
Grenada		
Nutmegs	1,770 tons	442
Mace	295 tons	156
Cocoa	2,311 tons	339
Jamaica		
Rum	2,306,000 gallons	2,570
Sugar	128,000 tons	2,656
Bananas	5,520,000 stems	2,049
St Christopher-Nevis		
Sugar	32,000 tons	756
Salt	7,319,000 tons	21
Cotton	462,000 lb	48

(continued)

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Table 1 (Cont.)

<i>Exports</i>	<i>Quantity</i>	<i>Value (£000 sterling)</i>
St Lucia		
Sugar	3,941 tons	88
Cocoa	416 tons	66
St Vincent		
Arrowroot	2,976 tons	86
Copra	1,185 tons	45
Cotton	229, 000 lb	26
Trinidad and Tobago		
Cocoa	4,022 tons	668
Sugar	90,000 tons	1,690
Petroleum	Crude – 31 mill. gallons	13,694
	Refined – 772 mill. gallons	

most in need of help, their governments were unable or unwilling to provide it. The Caribbean colonies were neglected by the metropolis, their issues only attracting concerted attention in the wake of protests and rioting as occurred on an unprecedented scale during the 1930s. The unrest of the interwar period combined grievances about economic privation with demands for political reform and independence.³⁰

In the period after 1940, constitutional reforms were introduced across the British West Indies. Jamaica was the first British Caribbean colony to attain universal adult suffrage in 1944. Elections with full suffrage were held in Trinidad in 1946 and a ministerial system was introduced in 1950 with key roles taken by Trinidadian politicians. The pace of this type of reform varied from colony to colony in the Caribbean and the situation was made more complex by the debate around the creation of a West Indies Federation as a political and economic union of the British colonies of the region. From the perspective of Colonial Office officials, the challenge was to steer increasingly autonomous legislatures, populated by politicians who could be suspicious of metropolitan priorities, to follow the policy lines that they favoured. As Caribbean territories moved towards independence and America sought to shape the future of the region, the provision of scientific and economic advice became a key strategy for the maintenance of British power.

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Table 2 Population density in the Caribbean territories, 1950 (*British Dependencies in the Caribbean and North Atlantic, 1939–1952, Cmd 8575*).

<i>Territory</i>	<i>Area (square miles)</i>	<i>Estimated population in mid 1950</i>	<i>Density (people per square mile)</i>
Bahamas	4,404	79,000	18
Barbados	166	209,000	1259
Bermuda	21	37,000	1761
British Guiana	83,000	420,000	5
British Honduras	8,867	67,000	8
Jamaica	4,411	1,403,000	318
Leeward Islands:			
Antigua	171	45,000	263
St Christopher-Nevis and Anguilla	153	48,000	314
Montserrat	32	13,500	422
Virgin Islands	67	6,500	97
Trinidad and Tobago	1,980	627,000	317
Windward Islands:			
Dominica	305	54,000	177
Grenada and Carriacou	133	77,000	579
St Lucia	233	79,000	339
St Vincent and the Grenadines	150	67,000	447

This book moves from an investigation of the Colonial Office vision of Caribbean industrial development, with its focus on laboratory research, to examination of debates about the appropriate road to industrialisation that occurred at meetings of a new regional body, the US-led Caribbean Commission, and then at the level of the colony. The book begins with a description of the conditions during the Great Depression that existed in Britain's West Indian colonies that prompted widespread protest, before exploring debate amongst British officials, scientists and economists about the best way to address Caribbean economic problems. It shows that officials in London contrived a solution that diverged significantly from that envisaged in the famous Moyne Report. On the assumption that the Great Depression had shown the world market for sugar as a foodstuff to be saturated, the Colonial Office decided to make plans to transform sugar into a raw material to make fuels and chemical products. This vision was inspired by the rapid growth of the synthetic chemical industry in Britain, Germany

and the USA in the interwar period that produced an expanding range of plastics, medical products and dyes. By 1942 the Colonial Office had created a new body, the Colonial Products Research Council (CPRC), to sponsor scientific research into finding new industrial uses for sugar and other tropical products. Chapter 2 examines the relationship between scientific investigation and colonial development that was embodied in the arrangements that emerged for colonial research during the first half of the 1940s and shows the important rhetorical and symbolic functions of scientific research for British colonial policy-making after 1940.

Chapter 3 describes the plans for colonial industrialisation that were formulated by the Colonial Office in the 1940s before placing these in the context of wider debates about economic diversification. The assumption by the Colonial Office that the colonies would follow its advice when it came to encouraging new industry was disturbed by the creation of the Caribbean Commission. This body had the ostensible role of coordinating policy for the Caribbean between the US and Britain in the first instance, but in reality it operated as a vehicle that allowed the US to expand its influence in the region. The Commission was a problem for Britain as it promoted a model of development that gave a far bigger role to the state in planning, funding and facilitating the growth of new industry than the Colonial Office deemed prudent. The contribution of this book is to show how debate at meetings of the Caribbean Commission about industrialisation in the region was a key area where wider British and US political and economic aspirations for the post-war world came into conflict.³¹

Chapters 4 and 5 look in detail at the results of new commitments to scientific research and Caribbean industrialisation at the level of the colony, in this case, the islands of Trinidad and Tobago (referred to as 'Trinidad' in this book). Chapter 4 explores the origin and significance of two new laboratories in Trinidad that undertook research in sugar chemistry and microbiology with the goal of encouraging new chemical industry. The debates of the 1940s on the best way to foster economic diversification discussed in Chapter 3 revealed a tendency amongst British officials to discourage the adoption of measures that were considered too state-centred and protectionist in nature. Funding scientific research to identify industrial uses for sugar, however, represented a resolution of the issue of how to take some action to encourage industry whilst still adhering to *laissez-faire* principles. The two laboratories created in Trinidad were described as places of fundamental research, meaning research into widely occurring, general phenomena, and this designation worked to carefully distinguish actions undertaken by the state in the name of development from

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more narrow activities that were considered to be rightly the business of the firm.

Chapter 5 reconstructs the process by which legislation to encourage industry was passed by the increasingly autonomous government in Trinidad. It provides an important re-evaluation of the story that is typically told about negative British attitudes towards Caribbean industrialisation and the crucial role played by Lewis in the genesis of legislation in the region. Despite the threat presented by alternative models of development, including those promoted by the US, the Colonial Office was initially successful in steering policy for industry in Trinidad along lines it saw as desirable until the 1956 elections that brought Eric Williams to power. This success was achieved not by direct instruction by London but through the judicious use of expert advisors who promoted the more liberal road to development favoured by the Colonial Office.

The final chapter examines the outcomes of the scheme to foster new industry through scientific research into new uses for sugar. By the early 1950s, officials at the Colonial Office were concerned that the work overseen by the CPRC was not making a tangible contribution to the economic development of the colonies, and the Colonial Office reorganised research in Britain and Trinidad so there was less focus on long-term fundamental research. The early 1950s saw a significant change of heart at the Colonial Office and this chapter considers the external and internal factors that contributed to the demise of the consensus that had previously existed that undirected fundamental research had an important role to play in economic development.

Science at the End of Empire shows the importance of expert advisors in attempts to influence the direction of industrial development in the Caribbean and the ways in which competition between the US and UK was played out through the politics of expertise. It demonstrates how scientific and economic advice enabled the Colonial Office to maintain political authority and influence at a time when Britain's ability to ensure a continuing relationship with its increasingly autonomous colonies was made difficult by poor economic conditions at home and the new role that America had assumed on the world stage. We can also see something of the ways in which political conditions and aspirations at the level of the colony and the region informed the responses of Caribbean legislators to the very different visions of industrialisation that were promoted after 1940. Finally, we can see how the rapidly changing political and economic conditions of the post-war period determined the success or failure of the various initiatives conceived to help the British West Indies see their fortunes transformed, including the hope that cane sugar could be reinvented as an industrial raw material.

Notes

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- Cyprus, Malta, Bermuda, Gibraltar, the Seychelles, Fiji, Tonga, the Gilbert Islands, the Solomon Islands, New Hebrides, Ellice Island, St Helena, Ascension Island, Tristan da Cunha, South Georgia, South Sandwich Island, the Falkland Islands and Pitcairn Island.
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