

## Chapter 4

# Fundamental Research and New Scientific Arrangements for the Development of Britain's Colonies after 1940

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Historians and sociologists of science have examined the shifting and contingent meanings of terms such as “pure science” and “basic research” (Calvert 2006; Clarke 2010; Gooday 2012; Schauz 2014). Exploring the function of these expressions in context has been important in disturbing any tendency to see the terms “pure science” or “basic research” as having stable meanings that have endured across time. This work has also explored the rhetorical intent behind the use of such terms and in doing so has shown concepts of “pure science” and “basic research” to be more than descriptions of scientific activities. Recognizing that categories of science have been reinterpreted at several points in the past so that they have political utility for actors has proven to be important in understanding the debates and negotiations that accompanied new funding and new arrangements for science in the twentieth century (Clarke 2010).

This chapter is concerned with the work done by the expression “fundamental research” in helping to create a system for scientific research intended to facilitate the development of Britain’s colonies after 1940. New government legislation created development grants and a Research Fund of unprecedented size in 1940 to be allocated by the Colonial Office in London. Research grants were issued for the in-depth investigation of areas such as the problems of human and animal diseases, new uses for tropical products, the

study of soils, and the improvement of cash crops, with a view to demonstrating Britain's commitment to take effective measures to develop its colonies. The creation of new funds for colonial development and scientific research was intended to restore Britain's reputation as an imperial power at a time when colonial unrest, anti-imperial critics in the United States, and German and Japanese expansionism threatened the integrity of the colonial empire. Despite its significant size and symbolic purpose, little historical work has explored the implications of the Colonial Office's Research Fund for the Colonial Empire or the research landscape in Britain.

The aim here is to account for the particular character of the new apparatus that was created for colonial research by reference to the function of the expression "fundamental research" in debates at the Colonial Office. Questions were raised in the 1940s about the type of scientific work that was needed for the development of Britain's territorial possessions. There was also disagreement over who had the authority to make decisions about the direction of research: scientific committees at the Colonial Office in London or the scientists who headed the departments of agriculture, medicine, and veterinary science in the colonies themselves. Various arguments were proposed in favor of centralized control of research at the Colonial Office that made reference to the problems in recruiting researchers, a need to improve the status of colonial research, and the importance of an efficient allocation of research money. In the course of the debate, some officials and scientists promoted the need for programs of fundamental research and endowed this activity with attributes that made metropolitan direction essential. Fundamental research was described as the investigation of widely occurring, general problems that occurred on such a scale that local supervision by individual technical departments would be inappropriate. Importantly, it was suggested that there were other types of research that were more suited to local supervision so that colonial science in fact comprised two types of research: general, fundamental research and specific and local investigations. This distinction between general and local research, rather than knowledge-generating work and the mere application of its results, helped alleviate the disquiet expressed by members of colonial technical departments that they would be denied opportunities to carry out research relevant to the problems they faced.

While the use of the term fundamental research to mean centrally directed general studies helped in negotiating the politics of colonial science, it was also clear, however, that not all investigations in the colonies were intended to have the same status. New laboratories in the colonies that were created after 1940 to address widely occurring issues were intended to have particular meanings that were not the same as the existing technical departments. In the late colonial period, there was a need for Britain to create symbols that could

denote a modernizing process at work in the colonial territories as demonstration of the strength of Britain's commitment to colonial improvement. Colonial laboratories created with the Research Fund that were concerned with general issues that transcended the individual colony were said to allow Britain's tropical possessions to make a contribution to the advance of world science. This ability to participate in the march of international scientific progress was one way in which it was said that Britain's colonies would become part of the modern world. Importantly, only fundamental research could bestow this status; other types of scientific activity, such as research into local issues, could not promote an institution to the level of a center for world science.

When officials and scientists distinguished between work that produced generalizable knowledge and work that resolved more discrete and limited problems, they projected a hierarchy in networks of knowledge in which some types of knowledge were more mobile than others and the greater reach of some forms of knowledge was associated with higher-status work. Scholarship that has employed the ideas of circulation and networks has not considered the importance of distinctions between different species of knowledge produced by so-called Western science (on networks and circulation in science see Secord 2004; Raj 2007; Sivasundaram 2010). A focus on the way knowledge in science moves is not sufficient once we acknowledge that the expression "science" covers a number of different modes. The movement of knowledge generated by fundamental research or local research can be quite different; networks at local and global levels do not necessarily involve the same personnel, institutions, or modes of communication. A tension between the need for generalizable research or local research, rather than "pure" and "applied" as we often understand them, continues to inform debate about the activities of international research institutions in fields such as rice research (Brooks 2010; Harwood 2015). The appeal of fundamental research or its equivalent is the appeal of doing work that seeks to establish general principles of wide relevance—a contribution to new laws, principles, or big concepts in science—and this work continues to have greater cachet than studies that furnish results of relevance only on a much smaller, or local, scale, even if this work is considered to have greater relevance and utility to specific groups of farmers.

The point that issues of prestige and status can be important for the decisions that are made about the funding and organization of science is perhaps an obvious one. Less explored are the ways in which prestige and status are *produced*. This chapter explores the ways in which the idea of "fundamental research" as "general research" was used in the negotiation of issues of authority, professional standing, and colonial and national prestige in the con-

text of discussion about the organization of research for Britain's colonies after 1940.

## A New Era of Colonial Development

In 1940, the British government passed a Colonial Development and Welfare Act (1940 CDW Act) that gave annual funds of £10 million for development in the British Colonial Empire. This was Britain's largest financial commitment to developing its colonies, and the act was renewed regularly up until the 1960s. The CDW Acts also included a substantial allocation for colonial research of £1 million each year from 1945. This made the Colonial Office the second largest government sponsor of scientific research in Britain until 1950 outside of the military sphere and also meant that the late colonial period saw Britain's greatest commitment to scientific research related to colonial problems by a considerable margin (Clarke 2007).

The need for an expansion of research activities in Britain's colonies was promoted during the 1920s, but nothing came of this suggestion because of the difficulty of securing the necessary funds from colonial and metropolitan governments. In 1938, an approach was made by the Colonial Office to the Treasury for a large research fund as recommended in a lengthy and influential volume on the state of Africa, *An African Survey*. The author of *An African Survey*, Lord Hailey (1938), produced his book after a fact-finding tour of the continent funded by the Carnegie Foundation. In *An African Survey* Hailey (1938: 1627) set out an argument that there was an urgent need for greater knowledge of conditions in Africa to ensure the success of development programs in the future: "History will doubtless look back on this period as being the most critical stage of African development; errors that are made now for lack of the knowledge which a well-considered scheme of special study might supply may well create situations which the future can rectify only at the cost of great effort and much human distress."

Hailey argued for the creation of a special research fund so that any "scheme of special study" would get the funding it needed. Calls for funds for development and money for science so as to avoid social and economic disaster in Britain's colonies in the future coincided with a moment when an acute sense of crisis existed at the Colonial Office. The Great Depression had proven disastrous for Britain's colonies, and unemployment, low wages, and the rising cost of living had led to riots in the British West Indies and elsewhere (Havinden and Meredith 1993; Harrison 2001). By the end of the 1930s, Britain faced demands from Germany for the return of its former colonies and was confronted by vocal critics of imperialism at home and in the United States. *An African Survey* was only one of a number of books and re-

ports that pressed for reform of colonial policy, and the existence of so many critical voices proved useful in persuading the Treasury that a new commitment was needed to colonial development (Constantine 1984). Hailey's book received a great deal of publicity and had sold out by 1939, with editions released in France, Belgium, Germany, and Italy.

Apart from the need for greatly expanded funds for investigating African conditions, Hailey also spoke in *An African Survey*, and then at the Colonial Office in person, of the need for greater metropolitan direction in scientific research. He asserted that central control of research would ensure the overall coordination of scientific investigation and avoid overlap and duplication in work. Metropolitan direction of colonial research was also promoted as necessary to create greater interchange in terms of people and ideas between British universities and research institutions and colonial research centers so as to raise the standard of colonial science. In conversation with officials at the Colonial Office, Hailey suggested that a new committee was needed in London comprising eminent British scientists who would endow research in the colonies with the prestige necessary to recruit high caliber research staff.<sup>1</sup> The implication was that existing colonial services that worked in the fields of medicine and agriculture, for example, needed to be supplemented by new staff who were dedicated and experienced researchers with a close relationship with metropolitan centers of science. This reflected some basic assumptions about colonial science, namely that there was a danger of low-quality work in the colonies because scientists were distanced from the major centers of their disciplines and that it was difficult to attract the most ambitious and capable scientists to work in such conditions. In discussions about raising the level of colonial research, officials spoke of a need to ensure that "any research work must be of general value" and not just of "purely local interest and significance."<sup>2</sup> The central coordination of research by a metropolitan committee would ensure that the work done addressed the most widespread problems. This category of problem would be most likely to attract highly qualified scientists who might currently be working at a domestic institution.

The Treasury approved Hailey's recommendations, to be applied to the whole of the Colonial Empire, and new legislation that provided free grants for economic and social development and a fund specifically earmarked for research was passed in 1940. For officials, the legislation marked a turn toward a vigorous, interventionist, and ambitious program of colonial development that would be based on the data provided by scientific research (Lee and Pether 1982; Constantine 1984; Ashton and Stockwell 1996). The Colonial Office hoped that the announcement in 1940 of a large commitment to research was seen as a guarantee that the large funds now authorized for development would be put to use in an effective and meaningful way since development

would be based on accurate knowledge about tropical conditions. At the Colonial Office, the new Research Fund was said to enable the British government to “substantiate, in as striking manner as possible, its professions of trusteeship on behalf of the subject peoples in the colonial dependencies.”<sup>3</sup>

### **Central, Regional, or Local Control of Colonial Research?**

In the early years of discussions about the organization of research in the colonies, we see the term “fundamental research” being used to resolve a central question. The issue was whether the new Colonial Research Committee (CRC) in London should be the authority in research, with the power to approve research schemes, issue funds, and oversee the appointment of staff, or whether this was the role of existing technical departments in the colonies—that dealt with agriculture and medicine, for example. Heads of technical services in East Africa claimed that they should organize research for their own territories to ensure that new research funds were spent on projects that were relevant to the problems they faced. On the other hand, the CRC and officials at the Colonial Office spoke of the need for research to be centrally coordinated by a group of eminent researchers in order to raise the prestige of colonial research and facilitate recruitment of high-flying scientists. In addition, it was said that the type of project envisaged dealt with issues that were not limited to individual colonies or even a regional group and this work therefore needed metropolitan oversight. The tensions that emerged between officers of the colonial services and scientists and officials in London were resolved by suggesting that in fact there would be two types of research. One would be research into problems of general science, or issues that transcended individual colonies or regions—this was designated “fundamental research.” Colonial governments would find plenty of work to be done in the investigation of more temporary, restricted, or local problems.

Based on the advice of Hailey, the Colonial Office formed a Colonial Research Committee in 1942 to oversee the spending of the Research Fund created as part of the 1940 CDW Act. The intention was to create an eminent body of leading British scientists, and the membership of the CRC included the Secretary of the Royal Society, the Director of the London School of Economics, and the heads of the research councils in Britain—the Medical Research Council (MRC), the Agricultural Research Council (ARC), and the Department of Scientific and Industrial Research. The engagement of such high-powered individuals, well known among British scientists, was intended to endow colonial research with a status similar to the work of the research councils so that scientists in British universities and research council units might consider employment in colonies. The Colonial Office gave the CRC

a great deal of authority in organizing colonial research. It was a body that could initiate, organize, and “advise upon and co-ordinate the whole range of research in the colonies irrespective of the provenance of funds” rather than merely advise the Office in making decisions on whether schemes should be sponsored or not (Colonial Research Committee Progress Report 1943). Endowing a London-based committee with responsibility for the coordination of research activities across the whole of the Colonial Empire shifted the balance of power in the organization of colonial research away from scientists in the colonies toward the center and gave the CRC greater powers than any existing scientific committee at the Colonial Office. This was a move that proved to be controversial. It soon emerged that colonial governments had ambitions for the formation of regional research committees in East, West, and Central Africa that would plan and execute programs of scientific research across a number of territories.

In its early meetings, the CRC made a number of arguments in support of greater metropolitan supervision of colonial research. Some of these were focused on the perceived shortcomings of previous arrangements for research in the colonies. Before 1940, the medical, agricultural, and veterinary departments in Britain's colonies employed officers for work in fields such as tsetse fly and sleeping sickness control, the education of farmers, or rinderpest management. The complaint that was often made was that these technical and medical staff had a large burden of day-to-day responsibilities, such as the laboratory preparation of vaccines, and thus very little time was available for research. The result was that very little long-term and in-depth study of basic conditions was undertaken (Worthington 1938). The CRC expressed the view that “not only was research in colonial institutions often insufficiently fundamental but often there was not even a special programme of research, Many research workers find it easier to do the day to day work rather than to concentrate on more distant and more exacting work.”<sup>4</sup> It became apparent that some members of the CRC did not have a high opinion of the abilities of members of the technical services to plan and execute research and believed a new class of experienced research worker needed to be engaged. Arguments were made for the creation of a chain of new colonial research institutes and a new Colonial Research Service in which appointments and programs of work would be supervised from London. It was reported that the secretary of the ARC, W. W. C. Topley, asserted the following at the seventh meeting of the CRC in 1942:

He was certain that to get a good team of workers and a good institute they must be part of a central service not under any local government, with terms of service determined by their own scientific colleagues and with chances of promotion as if they had remained in this country . . . . The workers in the colonies

must know that they have been given their jobs by men of scientific eminence in this country and that those men would ensure them all that was necessary for carrying out their art. They must work in conditions of the same kind as they would find in universities or research institutes in this country.<sup>5</sup>

Metropolitan oversight of colonial research by elite representatives of research councils such as the ARC was promoted therefore as essential for the recruitment of high-caliber staff. At a meeting of another research committee that was created specifically to deal with agriculture, animal health, and forestry it was claimed that research workers were different from other types of scientists and would only submit to supervision by individuals who understood the special conditions required for proper research work: "We doubt whether anyone who has not been an active research worker for a part of his life can effectively lead a research team with the understanding and appreciation that will bring out the best of which members are capable."<sup>6</sup> In other words, highly qualified scientific specialists possessed a particular temperament that meant that they would not readily yield to direction by the existing heads of the Agricultural, Veterinary, or Medical Departments.

It was also said by the CRC that the nature of research itself led to a need for central oversight. Arguments for the necessity of new arrangements for colonial research were given weight by the claim that "fundamental research" was work that investigated widely occurring phenomena that were not confined to individual colonies.<sup>7</sup> The CRC stated in its first annual report that, in the past, research in the colonies had been "dictated too exclusively by local and temporary interests, without due regard to the scientific possibilities, or to the scale on which a given investigation must be planned if it is have any reasonable hope of success," and "It is also important to remember that the frontiers of scientific research do not coincide with political boundaries. In so far as scientific problems in various parts of the world resemble one another, the boundaries are rather lines of latitude" (Colonial Research Committee Progress Report 1943). Only a metropolitan committee could have the view from above needed to coordinate research work into major problems that occurred in different places, such as malaria and rinderpest.

The move toward the centralized control of new research programs by the CRC in London was not universally endorsed, and news reached the Colonial Office that alternative arrangements for the promotion of research had been formulated in the colonies themselves. In 1944, plans for an East African Research Council serving the East African territories of Uganda, Tanganyika, and Kenya came before the CRC, and the committee met with R. Daubney, Director of Veterinary Services in Kenya, who was an advocate of this scheme. Daubney's view was that the East African Research Council would be a body that would organize research that addressed the local needs



of the region and that would support regional research institutes through the pooling of resources. It also emerged that plans for the regional coordination of research had been discussed by the technical departments in West Africa, and discussion was underway concerning the formation of a Central African Research Organization.<sup>8</sup> These bodies for the regional coordination of research accompanied a wider trend during the years immediately preceding the war toward the creation of increasing numbers of regional bodies to develop common policy and to pool information and resources. While closer union between territories in Africa in the long term, most especially political union, remained a matter of controversy, the coordination of economic and technical activities was often supported by colonial governments (Lee and Petter 1982: 88–101). The question that concerned the CRC was the degree of autonomy and authority in the allocation of funds for research that these regional research councils would enjoy in comparison to the CRC. The debate about proposals for the East African Research Council also quickly became a discussion about the type of research work that was actually needed.

In the meeting between the CRC and Daubney concerning the powers of the proposed East African Research Council, Hailey raised his concern about the ability of the council to supervise the sort of work that the CRC anticipated would be needed:

Everyone realised that there had been a certain amount of enquiry and research undertaken by each of the separate governments involved on their own initiative and with their own funds and no doubt a combined council would be a very valuable source of advice in undertaking local enquiry and research. The difficulty was that, for instance, the Medical Research Council here might feel that it was accustomed to deal with fundamental research and had at its disposal considerable sums and a far wider field for recruiting the necessary skilled personnel than a local research council would have.<sup>9</sup>

Hailey's point was that the CRC comprised a direct link between the Colonial Empire and metropolitan science and so could ensure the best workers were appointed for colonial research. The MRC, represented on the CRC by its Secretary, Edward Mellanby, was also experienced in fundamental research in a way that the colonial governments were not. Daubney's response was that he did not think that fundamental research "at the very highest level" was the type of work that was needed.<sup>10</sup> In his opinion, the colonies needed "competent investigation of common place problems that affected economic and social development."<sup>11</sup> The CRC was informed that scientists in East Africa feared that the London-based committees were to dictate the nature of research in the colonies, that this work would be largely academic, and it would not be related to issues that arose at a local level or were linked to development plans.<sup>12</sup>

The ensuing debate produced a number of attempts to define the type of investigation that was needed for the resolution of the problems of Britain's colonies by reference to the categories of "fundamental" and "applied" research. It became apparent that there was very little shared understanding or agreement about the exact definition of these terms. Confusion over the meanings of the two expressions raised questions about the appropriate location of research—if "fundamental research" in medicine meant molecular biology, then surely it could only be done in the laboratories of America or Europe? But if "fundamental research" referred to the determination of a cause of a disease, then it needed to be done in the field. Hailey suggested that the primary question was which body should have responsibility for apportioning research funds, the London-based CRC or the projected council in East Africa. It was decided that the priorities of the two authorities were different. While colonial governments were primarily concerned with the needs of a region, metropolitan bodies sought knowledge of the empire as a whole and were concerned with a wider scientific field. This meant that both the CRC in London and the East African Research Council were concerned with research, but of slightly different types. This resolution was endorsed by the Colonial Office's Financial Advisor, Sydney Caine, who suggested, "In practice the difference between "fundamental" and "applied" research would probably work out as the difference between those things in which the central body took the greatest interest and those in which the local council took the greatest interest."<sup>13</sup> Fundamental research in this vision was concerned with the issues that transcended individual colonies or groups of colonies and required metropolitan oversight. Applied research was not the application of results gained elsewhere but dealt with a different scale of problem, one that arose in the course of the work of the technical departments and did not require centralized coordination.

A distinction between centrally administered research and locally administered research was taken up, and it informed the new arrangements for colonial research that were introduced during the 1940s and early 1950s. Charles Carstairs, head of the Research Department at the Colonial Office, explained the two-tiered operation of colonial research in a letter to the Chief Secretary of the Central African Council in 1946:

A more useful distinction perhaps [than between fundamental and applied research as normally understood], is that between the scientific and experimental work which is necessary for the day-to-day discharge of the responsibilities of agricultural and other technical departments, and the long term work bearing on the basic problems of a given area which is best conducted on a semi-independent basis and without regard to immediate results or the solution of short term problems.<sup>14</sup>

The committees in London would oversee long-term work into basic problems, and the colonial administrations would be responsible for day-to-day work. The expectation was that the Research Fund would be the source of monies for centralized research, while the research done by the colonial governments would most likely be funded through the normal routes.

By 1952, around forty new research institutes had been created across the Colonial Empire using the Research Fund, and a Colonial Research Service (CRS) was created for scientists who would work in these laboratories. Significantly, both the research institutions and the specialists who joined the CRS were under metropolitan direction and did not report to colonial governments. It was said at the Colonial Office, "The regional institutions must not be slaves to local problems."<sup>15</sup> This meant in practice that the technical departments did not determine or vet the research programs of the new colonial laboratories, nor were they concerned with appointing the staff who worked in them. While medical, agricultural, and veterinary departments in regions such as East Africa were free to pursue their own projects, they found that institutes were created in their midst over which they had little control. The distinction between fundamental research and local research produced new apparatus in which there were two parallel systems for science in the colonies. While communication between the two was anticipated, one was not dependent on the other, so the distinction that was being employed between general fundamental and local research effectively severed any necessary relationship between the scientific work of the colonial governments and that organized by London. By rejecting a fundamental/applied research distinction in which fundamental research produced knowledge that was then utilized by technical officers, the Colonial Office avoided the implication that one area of work was the essential precursor for the other.

The key outcome of the conceptualization of research as comprising two species of investigation—general versus local—was the particular architecture created for colonial science after 1940 in which two systems coexisted and one of these was overseen from London. It did not mean that the investigations done in colonial laboratories after 1940 addressed only fundamental or basic issues, or that this work was academic, far from practical issues, or only concerned with advancing a particular scientific field. Research policy in colonial agriculture, animal health, and forestry focused on the resolution of short-term problems after 1948, partly in response to a wider British government drive to rapidly increase the volume of primary products in the empire in the face of a shortage of goods and dollars. The research agenda of colonial laboratories in other fields also often had an overt practical focus. The utility of the distinction between fundamental research as general research, coordinated across the whole Colonial Empire, and more narrowly defined

investigation was in producing new arrangements for colonial research that incorporated a desire to see closer relationships between the investigations in the colonies and metropolitan science while not disenfranchising existing scientists in the technical services.

## A World Center for Science

The range of new research institutions created from the Research Fund after 1940 included the Colonial Microbiological Research Institute (CMRI), established in Trinidad in 1948. This laboratory had a practical and a symbolic function and the term “fundamental research” was important to the negotiation of both. The formation of this research institute illustrates well the rationale that was employed to explain why new laboratories could not fall under the jurisdiction of colonial governments. It also enables some exploration of the relationship that emerged between centrally coordinated research and the problems of colonial development after 1940.

The CMRI was established by the Colonial Products Research Council (CPRC), one of the research committees formed at the Colonial Office to oversee the spending of the Research Fund of the 1940 CDW Act. The CPRC sponsored a range of research projects at British universities into areas such as the chemistry of sucrose. During the 1930s, the price of cane sugar collapsed on the world market, resulting in low wages, high unemployment, and riots on the sugar estates of places such as Jamaica and Trinidad. In the search for a long-term solution to the problem of a sugar industry in decline, the Colonial Office decided to support scientific research that would identify new uses for sugar as a fuel or a raw material for the chemical industry, and this program was then expanded to include research into new uses for a range of tropical products. In the body of their annual reports, the CPRC laid much emphasis on the fundamental nature of the work they sponsored into tropical products, saying, for example, about investigations into eugenol, a derivative of cloves grown in Zanzibar, “It has been recognised from the outset that it would prove extremely difficult to find new uses for eugenol and its derivatives and this can only result from fundamental research” (Colonial Products Research Council 1948). This work was defined as investigations that explored the general, basic chemical reactions of a compound: “It was recognised that the experiments having as their object the finding of alternative uses for eugenol and vanillin were highly speculative and the most promising lines of attack lay in the study of the general chemical reactions of these substances” (Colonial Products Research Council 1946).

The CMRI created in Trinidad was described as a laboratory that aimed to undertake “fundamental research in microbiology whilst also helping to

improve certain industrial processes.”<sup>16</sup> Along with work focused on establishing general principles, the CMRI carried out investigations with a clear practical value such as examining the use of surplus sugar as a medium for the fermentation of food yeast. Food yeast was a product that was high in vitamin B that the British government was producing in a factory in Jamaica in order to address problems of malnutrition in the colonies and in Europe at the end of World War II. In addition, the CMRI was inspired by the discovery of streptomycin to survey the microbes in tropical soils for antibiotic effects and maintained a reference collection of bacterial cultures for consultation by business and universities. The laboratory also studied Panama disease in bananas, investigated the microbiological processes that occurred during cocoa fermentation, and looked to find uses for waste products generated during rum distillation. When the CMRI was described as an institution for “fundamental research” in microbiology, it did not mean that all of its investigations were long term and exploratory, or far removed from the concerns of colonial industry.<sup>17</sup> The designation of “fundamental research” helped create arrangements that placed the research agenda of the CMRI under the control of the director of the laboratory, A. C. Thaysen. This meant that Thaysen had the authority and freedom to direct the scientists at the CMRI to undertake long-term study of basic underlying issues if that was deemed appropriate. It did not mean that the CMRI would completely ignore more practical problems.

In discussions that immediately preceded the creation of the CMRI, the suggestion arose that administration of the laboratory might be devolved to the Trinidadian government so that the colonial government paid the scientists at the institute and they would therefore only incur local rather than U.K. rates of tax. In this arrangement, a member of the Trinidadian legislature would be nominated to attend meetings of the CMRI. This suggestion prompted a furious response from Thaysen. He complained to the Colonial Office that such arrangements were inappropriate when the CMRI was charged with investigating issues that went beyond the concerns of Trinidad alone. “It is intended that this research institute should be a centre for microbiological research not only for the Colonies but for the Commonwealth as a whole,” he wrote.<sup>18</sup> Thaysen argued that this international standing of the CMRI would be compromised if the laboratory was attached to the Trinidadian government. So far, he said, “I have been recognised as an outsider, working, not under instructions from the local authorities, but on behalf of the Colonial Office which in starting our institute has had the interest at heart, not only of Trinidad or the West Indies, but the whole Tropical Empire.”<sup>19</sup>

Thaysen was very concerned with the public perception of the CMRI and worked hard to promote the laboratory as a high profile site of international science. He insisted that the laboratory have a prominent location, rejecting

a site at the Imperial College of Tropical Agriculture in central Trinidad and instead locating the CMRI in the capital, Port-of-Spain, saying he “wished to have his laboratory sited centrally and conspicuously so as to show people that colonial research means something.”<sup>20</sup> He commissioned the architects W. H. Watkins and Partners to produce plans for the laboratory and the modernist design was subsequently featured in an article in an architectural magazine, *The Builder*, in September 1948. Thaysen also promoted the CMRI in the Trinidadian press. The institute was the subject of numerous articles and reports during the 1940s and 1950s in Trinidad’s daily newspaper, *The Trinidad Guardian*. In the publicity surrounding the formation and opening of the CMRI, the international standing of the institute was emphasized over and over again. Shortly after arriving on the island in 1947, Thaysen informed *The Trinidad Guardian* that the CMRI was not purely a Trinidadian institute but would be serving the empire.<sup>21</sup> In 1948, the newspaper was told that no individual colonial government was paying for the institute, and therefore controlled it, but it “was a completely British Government venture.”<sup>22</sup> In one of a number of articles to mark the opening of the CMRI titled “Micro institute to be world centre,” the writer told how the CMRI would “put Trinidad on the scientific map” and quoted Thaysen as saying, “No effort has been spared, in fact, to make the Institute worthy of British science and of its position as a world research centre.” The writer then followed this point with this declaration: “The Trinidad Institute is we believe the only one of its kind in the British Commonwealth and one of the few such institutions to be found anywhere in the world. Its importance is attested by the number of distinguished scientists and other guests who have assembled for the opening and this Colony is fortunate to have been chosen as its home.”<sup>23</sup>

The message was clear, the function of the laboratory was to tackle microbiological problems of international importance, and this gave the institute great cachet. Trinidad would have the honor of acting as host to a world center for scientific research. Evidence that the CMRI was a world center for tropical microbiology was supposedly found in the eminent scientists that came to work at the laboratory from overseas. Thaysen was described in *The Trinidad Guardian* as a “scientist of the top rank,” and the arrival of new colleagues W. C. Forsyth, from the Macaulay Soil Research Institute in Aberdeen, and J. E. Rombouts, from the Netherlands, both received coverage in the Trinidadian press. While describing such individuals as “top grade staff,” the newspaper also raised the question of whether there would be room for Caribbean staff at the institute: “The chance to share in work of such an important nature should not be missed by talented and suitably equipped young men and women in the Caribbean.” Thaysen’s response to the enquiry about employing local staff was, “You must remember that the institute to be formed is not

purely a Trinidadian, but an Imperial affair. West Indians will be as welcome as anyone else." In other words, there might be room for Caribbean staff, but since the CMRI was a world center, scientists from the West Indies would not be prioritized over workers from elsewhere.<sup>24</sup> This remark gives an indication of the tension that could be produced with the creation of international status for new laboratories. These institutions might be symbolically important, but that did not mean they gave opportunities or other concrete benefits to local colonial populations.

The emphasis on centrally coordinated fundamental research had previously led to questions about attitudes of colonial peoples to the agricultural laboratories that were being created in their midst. The Colonial Office's Agricultural Advisor, Harold Tempny, questioned whether new arrangements for fundamental research would mean this work was valued by the inhabitants of Britain's colonies. According to meeting minutes, "he thought that central control might well prove deadening rather than enlivening to research generally and it would certainly make it very difficult to put across the results. The public in the colonies themselves would not feel the same sense of ownership and responsibility for what was going on, even though the quality of research was somewhat higher."<sup>25</sup> This reservation was brushed aside by the scientists on the CRC with the assertion that metropolitan oversight of research was necessary if high caliber scientists were to be recruited for colonial research. The secretary of the ARC, W. W. C. Topley, had the final word: "To get a good team of workers and a good institute they must be part of a central service not under any local government."<sup>26</sup>

The international standing of the CMRI was intended to enhance both the status of the laboratory and Trinidad and be a source of pride for local people. It was intended to be a symbol, signaling Britain's commitment to developing and modernizing its colony. If the CMRI was to denote a nascent modernity for Trinidad, then it was because the laboratory was able to transcend its locality and participate in the global circulation of knowledge. Not all knowledge produced in Britain's colonies was equally mobile. Some forms of knowledge might have only limited use, and, while valuable, this knowledge could not denote the modernity and high status for a colony that the Colonial Office was seeking in its sponsorship of scientific research. Fundamental research, however, produced knowledge that was likely to circulate widely as it explored the most basic and universal scientific phenomena. The ability to participate in the international advance of science could make a place like Trinidad part of the "modern, atomic-age world," in the words of a pamphlet published in 1956 advertising the work done under Britain's CDW Acts (Lewis 1956).

The fact that the international character and prestige of the CMRI was emphasized more often than the utility and relevance of its research work

demonstrates the extent of official concern with the public perception of British government actions after 1945. This confirms the point made by historians that the new colonial policy inaugurated by the CDW Act of 1940 was considered to have an important role in improving Britain's reputation as a colonial power (Constantine 1984; Havinden and Meredith 1993). In the second half of the 1930s, the British government had found itself having to defend its reputation as an imperial power in the face of vocal criticism by commentators in the United States and at home. There were revelations of high levels of malnutrition and disease and appalling housing conditions in many of the British colonies, and these were ammunition for those who wished to see an end to British imperialism or, as in the case of Germany, wished to have former colonies returned to them. Highly visible British interventions to modernize and improve economic conditions were particularly necessary in the British West Indies, as they had been the site of widely publicized riots in the 1930s. The British Caribbean was also a region where British imperialism was most open to U.S. scrutiny at a point where there were strident anti-imperialist voices in America (Constantine 1984). The issue that arises is whether the search for status through the creation of institutions of fundamental research led to the neglect of problems more pertinent to the development of individual locales. In addition, while the Colonial Office appeared to believe that colonial populations would appreciate the creation of laboratories in their midst that participated in the international advance of science, we can wonder about the sense of ownership that these institutions fostered in practice.

The CMRI was intended to be a highly visible demonstration of Britain's commitment to colonial modernization. It worked on a range of problems related to diseases of agriculture and the discovery of new drugs, but it had few successes in practice, and there is little evidence that it fulfilled the ambitions of the officials and scientists that were involved in its creation. The Colonial Office believed that the laboratories it created in such large numbers after 1940 would be a permanent legacy for the colonies after independence. It believed that siting institutions like the CMRI in British-controlled territories would teach the local inhabitants the value of scientific research. The reality was that, while medical laboratories often continued, many of the other institutions did not survive. While the Colonial Office and scientists in its employ worked to shape the meanings of these laboratories as emblems of a modernizing program it was clear in many cases that the focus on improving cash crops for export, for example, meant these institutions were firmly redolent of the exploitative nature of British imperialism for independent nations (Roseboom, Pardey, and Beintema 1998). The beneficiaries of the work of the CMRI were most likely to be British or American-owned businesses, so it



is perhaps not surprising that there was little interest in continuing its work after 1962 when Trinidad gained its independence.

## Conclusion

After 1940, officials and scientists at the Colonial Office in London considered an expansion of scientific research across the Colonial Empire. In their discussions, they often referred to the need for a focus on programs of fundamental research. The term was not usually deployed in the same way as the older expression “pure science,” which most frequently was used to denote work done without concern for application. Instead, “fundamental research” was used to refer to the investigation of general principles, or the most widely occurring phenomena, in contrast to more discrete problems. It was said to require administrative arrangements that provided a “view from above” and circumvented local oversight. By engaging with the ways that this term was being deployed after 1940 in discussions of the colonial empire, we can gain an insight into how actors negotiated issues of status and prestige that were important to them. Key was the claim that fundamental research produced knowledge that could contribute to science at an international level, giving stature to the workers, institutions, and even colonies engaged in this work. Fundamental research was general, imperial, international, or global science. It was work that produced the most mobile forms of knowledge.

While historians have considered the social and material factors that were important for the movement of knowledge in the past, this paper has been concerned with the rhetorical and symbolic functions of the idea of the circulation of knowledge. An examination of the science/development discourse that accompanied the creation of large numbers of new laboratories in the late colonial period shows that these institutions had meanings that worked on more than one level. The value of colonial laboratories was said to be their role in providing the necessary information for colonial development through fundamental research. In practice, the way in which knowledge generated by these institutions might inform the other functions executed by either metropolitan government or colonial administrations was not well articulated or apparent. The creation of colonial laboratories as semi-autonomous institutes that that undertook work that transcended the preexisting functions of the technical departments of the colonies and were overseen by metropolitan committees seemed to run counter to claims about the utility of an expansion of fundamental research. The new arrangements for fundamental research can be explained, however, when we realize that these laboratories also had a symbolic function—acting as both emblems of Britain’s modernizing in-

tentions and also representing special arrangements where scientists had full control over their research. The mobility of knowledge that fundamental research produced was related to wider issues of professional status, visions of colonial development and incipient modernity, and national reputation and self-esteem.

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## Notes

1. National Archives, London, U.K. (NA), CO 847/13/13, “Central direction of research.”
2. NA, CO 847/13/13, “Central direction of research.”
3. NA, CO 847/13/13, “Central direction of research.”
4. NA, CO 900/1, First meeting of CRC, 29/6/42.
5. NA, CO 900/1, Seventh meeting of CRC, 16/11/42.
6. NA, CO 927/88/5, “General policy.”
7. NA, CO 927/88/6, “Agricultural Research Policy Sub-Committee: organization of colonial agricultural research.”
8. NA, CO 927/3/1, “Regional co-ordination of research: East Africa.”
9. NA, CO 900/2, Minutes of the 23rd meeting of the CRC, 23/3/44.
10. NA, CO 900/2, Minutes of the 23rd meeting of the CRC, 23/3/44.
11. NA, CO 900/2, Minutes of the 23rd meeting of the CRC, 23/3/44.
12. NA, CO 927/2/6, CRC 137, “Social Research in East Africa: note by Secretary,” 26/10/44.
13. NA, CO 900/2, Minutes of the 23rd meeting of the CRC, 23/3/44.
14. NA, CO 927/3/4, “Regional coordination of research: central Africa.”
15. NA, CO 900/1, Minutes; CO 927/2/6, “Regional coordination of research: East Africa.”
16. *Nature*, 25 September 1948, p. 162.
17. *Nature*, 25 September 1948, p. 162.
18. NA, CO 1042/132, “Establishment of Colonial Microbiological Research Institute in Trinidad.”
19. NA, CO 1042/132, “Establishment of Colonial Microbiological Research Institute in Trinidad.”

20. NA, CO 1042/132, "Establishment of Colonial Microbiological Research Institute in Trinidad."
21. "Microbiological institute to get top grade staff," *The Trinidad Guardian*, 12 January 1947.
22. "Chemist from Scotland to Join 'Micro' Staff," *The Trinidad Guardian*, 2 July 1948.
23. "Micro Institute will be World Centre," *The Trinidad Guardian*, 4 July 1948.
24. "Microbiological Institute to get Top Grade Staff," *The Trinidad Guardian*, 12 January 1947.
25. NA, CO 900/1, Minutes.
26. NA, CO 900/1, Minutes.

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