

CHAPTER 10

The Territory of Medical Research: Experimentation in Africa's Smallest State

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In view, however, of the small size of the Gambia, its comparatively simple (though nonetheless pressing) problems . . . there would seem to be a strong argument for considering it as a case for the application of an overall research program.

—Raymond Firth, “Social Problems and Research in British West Africa”

A needle of swamp and arid savannah, the Gambia is the smallest country in Africa. It is a nation of riverbanks, running roughly two hundred miles east from the Atlantic Ocean and, at its widest, only thirty miles across. The Gambia is enveloped by Senegal and, though the British briefly pursued a policy of integration, its political sovereignty has remained unchallenged since it gained independence in 1964. The Gambia's relative political stability has been a draw for foreign aid; however, it remains one of the poorest countries in the world (UNDP 2010). It is also one of the most researched: the UK Medical Research Council (MRC), whose laboratories and field stations occupy sites on the north and south banks of the Gambia River, has funded and hosted international scientists for the better part of a century. Experiments conducted with Gambian populations have yielded key insights about nutrition, agronomy, and infectious and vector-borne diseases, transforming the field of tropical medicine (Geissler et al. 2008; Malowany 2001). The majority of that work has focused on malaria. Clinical studies conducted in the Gambia on the effectiveness of bed nets, pharmaceuticals, vaccines, and residual sprays form the basis for many current global policies on prevention and treatment (e.g., McGregor 1982; Snow et al. 1988; Conway 2007). “What the nation may lack in size and economic clout,” said Tom Paulson in the *Seattle Post-Intelligencer* on March 23, 2001, “it makes up for as Africa's research laboratory.”

The Gambia presents a provocative case study in how size mediates the impact of scientific inquiry on state sovereignty. This chapter, like others in this volume, is concerned with the shifting intersections of research and government under distinct political-economic configurations. Drawing together research conducted under a colonial administration with that undertaken today, it examines how nationhood, expert knowledge, and public health are articulated through past and current forms of experimentation. Further, I take up the issue of how scientific activity animates governmental practice as a question of scale, mapping the cross coordinates of science and development specific to this small nation. Like Raymond Firth in the epigraph that opens this chapter, I am interested in how Gambia's territorial dimensions impact the programs of research carried out in the country.

So what are the distinct administrative features of a microstate? In his analysis of state formation in Africa, Jeffrey Herbst (2000) claims that African politics labor under the strain of an excess of land. Unlike the traditional political analyses of European state formation, which link national development to conflict with neighboring states over the expansion of frontiers (e.g., Tilly 1990), Herbst suggests that while territorial conquest is clearly fundamental to the colonial enterprise, European investment in Africa prioritized securing access to labor rather than expanding control over land. With the exception of a few settler colonies, colonial influence petered out a short distance from capitals, established primarily to facilitate international commerce. The Gambia, for instance, was only ever a colony along its coast, where expatriate traders and officers resided. The rest of the country, inhabited primarily if not entirely by Africans, was a protectorate governed indirectly through village chiefs (Gray 1940). Herbst reads this systematic neglect of the rural areas into current African instabilities. The problem, he suggests, is not one of belligerent neighbors: state boundaries, though arbitrary in light of precolonial politics, have remained undisputed since independence. Rather, he argues, it is precisely this peaceful coexistence that has weakened the African state. Without the threat of invasion, there is little incentive to systemize taxation (which, in Europe, had served to underwrite warfare and, later, welfare), establish political infrastructures, or occupy frontier areas. Propped by foreign aid, governmental power pools at the core and dissipates at the periphery, a situation that breeds internal division and civil conflict. It is for these reasons that Herbst (2000, 140) believes "African conditions privilege nations that are relatively small." The smaller the state, the easier and less costly it is to consolidate administrative capacity.

With regards to the Gambia, Herbst's analysis is compelling, if only to help us understand how this poor tract of land avoided being absorbed into better-resourced and more-developed Senegal. One could argue that the combination of high population density and regional tensions worked to reinforce sovereignty; the very real prospect of becoming Senegalese catalyzed Gambian national identity (Welch and Claude 1966).¹ However, like any small economy, the Gambia is highly susceptible to external influences; according to the historians Arnold Hughes and David Perfect (2006, 277), "Gambia's lilliputian size and global marginality . . . mean that small crumbs from a donor's table could be sizeable." The Gambia's history as a site of research underscores the dramatic impact of foreign institutions on the micro-state. After almost seventy years of location-based research, the MRC is now one of Gambia's largest employers (Beckerleg, Austin, and Weaver 1994; MRC Annual Report 2007). Though the institution is careful to demarcate its activities from governmental practice, it ostensibly functions as a parastatal body.² Enrolled as experimental subjects or employed on projects as assistants or menial laborers, Gambians have benefited from, and come to depend upon, the economic and health care opportunities provided by transnational scientific activities (Geissler and Molyneux 2008; Kelly et al. 2010). Rather than a vehicle for political consolidation, Gambia's compactness has rendered it available for foreign intervention. "Africa's laboratory" points to the limitations of an analysis that links state capacity to its size without due consideration to the role of transnational actors.

The experimental appeal of the Gambia's smallness has shifted over the years. During the colonial era, the country offered an ideal landscape to pilot new technologies and techniques of cultivation because their effects were clearly legible (Reynolds and Tansey 2001, 21). Among a delimited community and within a manageable landscape, experimental interventions produced immediate impacts that could be convincingly projected on a national scale. As opposed to the large, geographically diverse, and diffusely inhabited Tanzania (once described by a German colonial administrator "as a poor place for European experiments" [Bernhard Dernburg quoted in Iliffe 1969, 81]), the Gambia's size meant that research could be controlled and contained—scientifically, politically, and financially. As Sir Hillary Blood, the governor of the Gambia from 1942 to 1947, remarked in support of the nomination of a female nutritional assistant to the Colonial Office: "on account of its small size, Gambia could be regarded as a very suitable place for experimental appointments" (quoted in Berry 1998, 22).

The continuing significance of the MRC laboratories in the Gambia for global public health research is in large part due to the comprehensiveness of studies undertaken under its auspices. Sir Ian McGregor, the MRC's first scientific director, spent over thirty years producing a detailed demographic profile of the entire resident population of four coastal villages. The data revealed the long-term impact of malaria on community health and has provided the baseline for research into malaria morbidity and mortality, acquired immunity, and the potential effectiveness of disease control interventions.³ That experimental value has allowed a shift in the scientific rationale for research in the country, from the developmental schemes piloted during the colonial period, which generated insights of relevance to the governance of colonial territories, toward that whose critical unit of scale is not the nation-state.⁴ The Gambia has long operated as the tropics in miniature, offering a setting from which to generate public health policy for global application.

I track that evolving sociopolitical significance of research in the Gambia across two central sections. First, I begin by describing a late colonial project—described by its coordinators as the Gambia Experiment—intended to dramatically improve the health and standard of living of Genieri, a village on the south bank of the river, through mechanized rice cultivation of the surrounding swamplands. While the modernization of village life was central to the project's justification, the experimental protocol eschewed social transformation, emphasizing instead a prolonged process of so-called grafting of new agricultural practices and technology to village society. Of particular interest are the conflicting ideas held by the research team and the British Colonial Service about the scale of the experiment and what these views implied about the experiment's overall objective. Ultimately, these conflicting visions brought the project to a halt, but not before Genieri had undergone considerable transformation as a site of both agricultural and scientific knowledge production.

I then describe an experiment that took place between 2004 and 2007, just east of Genieri, which also sought to improve community health through a large-scale reworking of the Gambian swamps. Out of step with the current emphasis of global malaria control policy on the distribution of bed nets and home treatment, the Larval Control Project (LCP) drew connections between agricultural practices, intensive community collaboration, and improved health, echoing the rationale of the Genieri project conducted sixty years earlier. Further, like the processes of grafting agricultural practice

trialed by the Gambia Experiment, large-scale larval control was ultimately deemed not viable in the Gambia, reflecting a similar misalignment between the scale of the project and that of the health problem it sought to address. The extension of the LCP's experimental practices to other aspects of village life reveals, however, the ways in which contemporary scientific activity animates development and how the social capacity of research may be different from that of experiments conducted in the past.

In discussing these two experimental projects my aim is not to draw a direct comparison but rather to demonstrate the different ways in which Gambian populations have become objects of governmental practice and biomedical knowledge. In the conclusion I will bring these empirical insights to bear on the MRC's recent decision to shift funding out of the Gambia and consider how this policy redraws the boundaries between experiment and social improvement, science and the state.

The Gambia Experiment

In 1946 many people who were living in a world dislocated by six years of war and struggling to get back to normal saw the necessity for change in Africa. The Gambia Experiment was a small attempt to make such change to persuade a village to take a gigantic step into the twentieth century.

—Veronica Berry, *The Gambia Experiment*

The oldest of Great Britain's possessions, the Gambia's initial value to the empire was as a trading post.⁵ But long before Bathurst (the capital city now called Banjul) became a Crown colony, the River Gambia was entangled in the world economy. Since the fifteenth century, the Portuguese had maintained lucrative commercial relations with the riverside kingdoms, exchanging crops, cloth, and metalware for hides, ivory, and, eventually, slaves (Gray 1940).⁶ Two centuries later, the Gambia had developed links with the British, French, and Dutch, who vied with the Portuguese for the exclusive right to trade in the estuary. In 1817 the British formalized their claim, establishing a garrison and battery to protect their merchant vessels and suppress the slave trade (Gailey 1964). Poor in natural resources, the Gambia's income was exclusively derived from re-exported goods. British mercantile interests in Bathurst did not extend beyond its function as an entrepôt until the London-based firm Foster and Smith recognized the profit-making potential of peanuts: in 1831 they built a mill in London to crush peanuts and

render their oil, catalyzing a global market for the crop. By 1860, the Gambia had become the world leader in peanut production, exporting over 10,000 tons of peanuts to Europe and the United States (Wright 2010, 127–41).

While lucrative as a cash crop, peanuts did not provide a stable basis for a national economy. The rapid expansion of peanut cultivation came at the expense of other forms of agricultural production. Because they were harvested at the same time as other staples (such as rice, sorghum, and millet), growing peanuts meant farmers produced little else. By the mid-nineteenth century, demand for rice increased dramatically, while domestic production almost disappeared (Carney and Watts 1991). Farmers were able to buy rice on credit from British and French merchant houses, but at exorbitant interest rates. Thus, even when peanuts prices were high, farmers could barely afford the food they no longer grew. A poor yield or a drop-off in market prices plunged rural areas into debt. When Bathurst became an official colony in 1893, the British government also advanced rice to farmers, much of which was exported from Germany, who controlled a considerable portion of the East Asian market. With the outbreak of the First World War, this commercial arrangement was no longer viable and the Gambia was plunged into crisis (Wright 2009, 171).⁷ As shipping to the colonies came to a halt and the oil industry was put on hold, peanut demand plummeted. Following the price collapse of the 1930s, the situation in the Gambia reached its nadir; the escalation of rural debt, food shortages, and the depreciation of the franc deepened the colony's dependence on the global groundnut market, which under the specter of another world war was increasingly volatile (Gray 1940, 487).⁸

In 1939 the British government passed the Colonial Development and Welfare Act to redress these economic vulnerabilities shared by the majority of British colonial subjects.⁹ Radically expanding the scope of previous legislation, the act established an annual allowance of five and half million pounds for development projects and colonial research. This financial commitment to the colonies represented a sea change in British imperial governance.¹⁰ Before the wars, the British pursued a policy of stringent self-reliance; colonial budgets were not to exceed the revenue they generated, and financial support was only extended for military matters, commercial infrastructure, or dire circumstances.¹¹ A political about-face, the 1939 act provided for large-scale investments in agriculture, education, public health and, further, for research in these areas (Havinden and Meredith 1993, 215–24). Though the Gambia was not a major recipient of welfare funds, govern-

ment officials were awarded grants to pilot development schemes and collect socioeconomic and medical data. In 1944 the Gambia became the site of the Human Nutritional Research Unit (HNRU), an institution intended to intermediate between basic research and applications in the tropics by linking the London School of Hygiene and Tropical Medicine, the Hospital of Tropical Diseases, and the Colonial Office (Burgess 1956). Margaret Haswell (1975, 91), an agronomist who, under the auspices of the HNRU, conducted extensive research in the Gambia, explains the rationale: “Gambia was originally chosen by the Human Nutrition Research Unit of the Colonial Medical Research Council as a suitable area for research into the present problems and the development potential of rural peoples of the tropics because it offered a microcosm of conditions which were in fact widely prevalent in larger and less manageable areas.”

The most pressing of these “present problems”—so clearly rendered in miniature—were food insecurity and malnutrition. The compounded effect of the Gambia’s sandy soil, volatile climatic conditions, and groundnut monoculture made the country a particularly “suitable laboratory for nutritional inquiries” (Haswell 1975, xiii). Further, land in the Gambia seemed to be available in abundance: only approximately 25,000 out of a total of 334,000 acres of the tidal flood plain were exploited for rice production (Webb 1992, 553). The Gambia Experiment was the first large-scale nutrition study oriented toward national application. Combining expertise in anthropology, agronomy, nutrition, and medicine with technical knowledge of modern agricultural methods, its central objective was to transform the nutrition and living standards of a single village by increasing the acreage of swampland under cultivation. The project developed out of a proposal made to the Colonial Office by Benjamin Stanley Platt, the newly appointed director of the HNRU, who had conducted extensive nutritional surveys in the Gambia, Malawi, and Tanzania during the Second World War. A doctor by training with a penchant for fieldwork, Platt emphasized the potential of native resources to address public health problems; his multisectorial surveys not only attended to levels of malnutrition but also to local foods, taboos, cultivation practices, and gastronomic customs. With the funds made available by the Colonial Development and Welfare Act, Platt saw the potential for “digging into the fundamentals of African domestic economy” with the purpose of “utilizing the immense potentialities of this chronically indigent territory” (cited in Berry 1998, 25–26).

In 1946 Genieri, a Mandinka village located 110 miles up the river from

Bathurst, was chosen as the site for the Gambia Experiment. At the time, the population of Genieri numbered 460 and suffered from a high mortality rate; almost half the children born in the village died before reaching the age of ten. Positioned on a sandy ridge and overlooking a tidal swamp, Genieri spanned 2,800 acres of land, only about 10 percent of which was used for growing the main dietary staple, rice. As groundnuts were regarded the domain of men, rice was cultivated exclusively by women, a gender division that, combined with “the use of primitive tools and the failure to use manures,” the Colonial Office claimed “resulted in low productivity” (cited in Berry 1998, 224). The results of an initial survey conducted by Platt confirmed that Genieri’s epidemiological profile and inadequate food supply “was representative of the majority of rural villages in African colonies,” and as a “fairly compact political, social and to some extent economic unit,” it was identified as an advantageous site for controlled experimentation, a veritable “sociological laboratory” (cited in Berry 1998, 171). Genieri’s location was also strategic: in the nearest town, Jenoi, the Department of Agriculture had established a field station to conduct experiments on salt-resistant strains of rice.¹² The relative isolation of the village from the urban economy of the coast and the proximity of agricultural expertise would enable experimenters to pilot “a pattern which can be copied in setting up other mechanized units on a production basis in communities in Gambia and indeed throughout West Africa” (H. A. Harding quoted in Berry 1998, 39). The challenge then, at least according to the Colonial Office, was to ensure the experiment modeled “the actual conditions which might obtain in the subsequent units” (H. A. Harding quoted in Berry 1998, 39).

The experimental protocol outlined two distinct yet interrelated initiatives. In the first years, an interdisciplinary Field Working Party, under the direction of William Berry¹³—a nutritionist who had previously worked under Platt—and in connection to the HNRU, would conduct general surveys on Genieri residents’ state of health, levels of food consumption, and farming practices. Agricultural studies would describe the features of Genieri’s climate and soil composition; ethnographic investigations would examine the local forms of social cohesion, land ownership, education and food consumption; finally clinical research would study the prevalence of anemia and parasitic and infectious diseases, as well as conditions associated with malnutrition (for example, potbelly), the height and weight of children, the daily calorie expenditure of domestic and agricultural work, and the strength and endurance of laborers.¹⁴ Following this survey work, the Department of

Agriculture, under the direction of the Colonial Office, would conduct trials on the application of “mechanization” into village life, using tractors, plows, harrows, fertilizers, and irrigation to reclaim the low-lying salt marshes, first for cultivating rice and eventually to introduce a wide range of crops.¹⁵ After a period of three years, these two sets of knowledge were to be “fused,” comparing the cost of the interventions, the changes in caloric intake of the workers, and the overall improvements in health.

In technical terms, the experiment was not radical. “There are no special problems here,” Berry wrote in a report to the Colonial Office, “the large scale cultivation of ‘bottom lands’ or fens by mechanical means is standard in both English and American agricultural practice and in both countries is an essential means of realizing the high potential fertility of the soils” (quoted in Berry 1998, 25).¹⁶ The Gambia Experiment’s particular challenge was, according to Berry, “the grafting of agricultural innovations onto African Society,” introducing previously tested methods onto a landscape that was already farmed: “it must be clearly understood that our problem is not the technical one of working out the best machines and fertilizers; that will be done by other bodies, in Tanganyika and some of the West African Colonies. There, unoccupied land will be farmed as estates, and immigrants, leaving their own village societies, will be molded into new ones formed largely around the concerns of the estate. Our problems are those of using lands already farmed and a society already established. . . . Ours is not an agricultural demonstration plot, it is a human experiment” (quoted in Berry 1998, 54).

With society as its subject, the success of the Gambia Experiment hung not upon the immediate efficiency of the methods but rather upon the degree to which a modern agricultural system could be grafted onto Genieri village. In proposals and reports to the Colonial Office, Berry emphasized the gradual processes of molding the attitudes of farmers and of enabling the residents of Genieri to improve their standard of living on their own terms. Though the agricultural methods were preformulated, the experimental protocol organized that activity in such a way as “to give the local people confidence in their ability to control their environment” (Haswell 1953, 74). In the first year of the experiment, volunteer villagers were given practical courses in agricultural science and machine operations and also in reading, writing, arithmetic, and biology. This pedagogical process was complemented by finely grained research into local customs and methods of farming: as Margaret Haswell (1953, 72) observed, “they seem much more prepared to advance if what they do not know can be explained in terms

of what they do know.” To influence agricultural practice, generating data on increased crop yields was not enough. The value of modern technologies would ultimately be adjudicated by farmers and thus had to be demonstrated within the social organization of existing practices (Henke 2002). Further, the credibility of those demonstrations—whether or not farmers would continue to accommodate novel practices after the experiment ended—depended upon the degree to which farmers trusted the experimenters. To encourage those relationships, the Field Working Party built a clinic in the village and supplied free rations of rice for volunteers. In exchange the villagers provided supplementary land on the perimeter of their tillage areas to extend the acreage covered by the experiment.

This collaborative experimental process of grafting technologies onto Genieri society was ultimately intended to ensure the sustainability of the intervention on trial. On the whole, colonial development in the Gambia (and elsewhere in Africa) pursued the model of a plantation economy, increasing the production of cash crops by turning African farmers into paid laborers. The Gambia Experiment, in contrast, sought to improve production by retaining and reinforcing the collective features of village life and, in so doing, “avoid the social disintegration that is an inevitable consequence of advancement” (cited in Berry 1998, 225). Moreover, as the economic benefits of these new technologies would accrue to the village as a whole, the scheme would presumably pay for itself. When the agricultural equipment was introduced to the village at the start of the second year, the research community was confident in the project’s methodology. In their annual report for 1947 to 1948, the London School of Hygiene and Tropical Medicine relayed the promising work in Genieri: “It seems likely that the villagers, having already recognized the value to them of improvements in production brought about by mechanical means will wish to put the money towards the purchase of equipment for themselves” (cited in Berry 1998, 224–25).

Initially, that optimism was vindicated; after the first two years of the Gambia Experiment, both the health of the village and its agricultural output had improved; in 1948 returns on labor increased by over 50 percent (Haswell 1953, 79). However, at the end of its second year, the future of the Gambia Experiment was becoming increasingly uncertain. The problem that had plagued the project from the outset was whether it was to be considered research or development. Though Berry insisted that the Gambia Experiment constituted “research in application,” he recognized that

its emphasis on social improvement suggested that it must do so “not, as many might perhaps prefer it, with minimum disturbance, but with the maximum of genuinely beneficial change” (cited in Berry 1998, 51). While the Field Working Party maintained that nutritional concerns—that is, the enhancement and diversification of food supply—should remain the experiment’s central focus, from the point of view of the Colonial Office “beneficial change” had to be measured in economic output: “I quite appreciate that at the present the methods of cultivation are entirely experimental . . . [but] it is clear that if such mechanized cultivation is to be multiplied, it must be on an economic basis since neither His Majesty’s Government nor the local Governments can afford to subsidise the loss on a large number of units” (H. A. Harding quoted in Berry 1998, 39).

Rather quickly it became clear that the increase in rice production would never offset the costs of installing and maintaining the new machinery. First, the reclaimed acreage covered by the experiment was too small. As Margaret Haswell (1953, 78) reflected years later, the mechanical requirements to drain and irrigate the swamps for rice cultivation were “out of all proportion to the scale of the project.” Under Platt’s direction, Berry had attempted to maintain the experiment’s wide remit, requesting that in addition to harrows, ploughs, and drills to drain the rice that also sifters and diesel engines for milling and parboiling cereal grains be introduced. “No work,” he wrote to the Colonial Office, “has, however, been done, either in the Unit or elsewhere, on the technology of the preparation of native meals and flours from various millets and sorghum” (cited in Berry 1998, 241). The value of demonstrating the health impact of agricultural mechanization did not solve, however, the fundamental problem “that the Genieri experiment is too costly to repeat on extensive scales.”¹⁷ Following the advice of the Colonial Office, the focus shifted to increasing the production of groundnuts, simpler to cultivate and more likely to generate profit.

This change of protocol might have been anticipated. When Platt initially proposed the Gambia Experiment in 1946, the governor of the colony had expressed anxiety that the experiment might too closely overlap “high-priority” schemes planned by the Colonial Development Corporation (CDC). In contrast to the ideological impulse of the Colonial Welfare and Development Act, the central purpose of the CDC was to launch development schemes that would generate profit for Britain. In 1946, its first year of operation, the CDC launched several projects in the Gambia, including a poultry farm on the coast and a large-scale mechanized project to clear rice

lands and harvest rice mechanically just up river from Genieri.¹⁸ As questions were raised about the economic feasibility of the Gambia Experiment, the Colonial Office insisted on altering the project's experimental protocol to better support the work carried out by the CDC. Critically, the experimental groundnut plots would have to be much larger; the experiment was extended beyond Genieri to Jomarr, a village that was "more rectangular in shape" (cited in Berry 1998, 160) and thus more convenient to divide into experimental plots. To accommodate the scale of production, a number of villages in the vicinity of Genieri would have to be aggregated and redistributed into economic units: "the villages would be in groups of 20, with headquarters for each group for mechanical workshops and technical administrative and social service area" (cited in Berry 1998, 216).

The plans to restructure Genieri proved to be the breaking point for the Gambia Experiment. No longer an investigation in "grafting" technology—"done in such a way that village society is not disrupted"—it became the pilot of a plantation. Berry and other members of the team resigned and the experiment was ended in December 1950.¹⁹ The agricultural work continued under the direction of the governor and the Department of Agriculture, who demarcated two large blocks of land for mechanization, one communally cultivated by villagers and the other dependent on paid labor, both of which were deemed a failure just a year later. Despite the use of machinery, the application of fertilizers, and draft animals, crop yields had not increased significantly. Moreover, farmers, who had become increasingly "contract-minded," seemed incapable of taking a long-term view of the experiments. In his report, the director of the Department of Agriculture expressed shock that the villagers' only response to his detailed explanations of the method and purposes of mechanization was to ask, "will there be any more contracts for clearing next season?" (cited in Berry 1998, 161).²⁰

In his analysis of colonial policy following the Second World War, Christophe Bonneuil (1999, 2000) reads the emphasis on experimentation as a strategic rhetoric that helped the colonial state achieve greater control over its territory and justified the money lost when large-scale development schemes ended in failure. Regardless of their agricultural impact, experiments in mechanization, swamp drainage, and resettlement made villages more amenable for surveillance and intervention: they generated unmediated data on the population and, in so doing, shifted the object of governmental control from the community to the household heads. Throughout the 1950s and early 1960s, approximately 10,000 additional hectares

of swamp were reclaimed for rice production in the Gambia to relatively limited economic success (Webb 1992). These vertical, technocratic experiments transformed Gambian agrarian society into a series of individualized units that, ironically, would serve as the basis for “grassroots” development projects in the 1980s and 1990s (Sumberg 1998).

The pragmatic possibilities of experimentation for the Colonial Office, and later the independent Gambian state, did not undermine the potential of the Gambia for basic scientific research. On the contrary, following the collapse of the Gambia Experiment, Platt, in his position as director of the HNRU, negotiated further funding for a research laboratory at Fajara. With an expanded brief, the newly named MRC Laboratories, the Gambia, planned to conduct “not only research in tropical medicine but also in general medical problems, some of which can more easily be studied in the Gambia where many cases can be seen of diseases which are rare [in the UK]” (Platt quoted in Berry 1998, 199).²¹ One of the first overseas basic research facilities, the MRC Laboratories in the Gambia was designed to conduct fundamental research in biochemistry and virology. In the years that followed, it would provide significant contributions to international science, while partly abandoning the task of directly applying that knowledge.²² As the MRC unit grew, exploring topics from anemia to liver disease and establishing new field stations up river, its approach to tropical medicine came to be referred to as “medicine in the tropics” (Tansey and Reynolds 2001, 37). The implication of that shift away from site-specific or “applied” problems was that the MRC could operate independently from governmental interests whether represented by the Colonial Office or, later, the Gambian state.

In hindsight, the biopolitical orientation of the Gambia Experiment—to bring scientific knowledge to bear on the organization and life of the population—was exceptional for research undertaken in the country.²³ After independence, the Gambian government experimented with both small- and large-scale swamp development and irrigation schemes to increase the productivity of rice growers (Carney 2008; Carney and Watts 1991). But these projects had no point of contact with the extensive research (nutritional or otherwise) conducted under the auspices of the MRC and were designed and implemented with foreign assistance—provided alternatively by the Taiwanese government, the World Bank, and the People’s Republic of China. The MRC, meanwhile, has continued to operate independently from the government, though owing to its long institutional presence and the sheer

size of its operations it has had a considerable impact on the health and wealth of the population. Its interactions with public institutions—such as hospitals, health centers, and universities—have depended on the scope of particular experiments and involved periodic support. The tenor of the MRC’s view of its relationship to the Gambian government has remained consistent with how it was initially described in its 1957 report: “The African population is cooperative and the Government has warmly welcomed the presence of a research project, which makes an important impact on the life of a small community. Relations on all sides are cordial, to the benefit of all concerned” (cited in Reynolds and Tansey 2001, 21).

The following section gives those relations empirical texture by describing an MRC trial conducted in the vicinity of Genieri almost sixty years after the village first became an experimental site. Though by no means as “applied” as the Gambia Experiment, the Larval Control Project (LCP) piloted a policy of environmental management and thus aimed to establish links between research protocol and local practice—in other words, to “graft” a new technology onto the particular features of the experimental locality. Like the Gambia Experiment, the LCP’s intervention was deemed inappropriate for its setting; the scale of the problem investigated could not be sustained by the scope of a scientific study. The LCP’s fate, and that of the upcountry field station from which it was conducted, reveals what has changed in the relationship between science and government in the postcolonial Gambian context but also what ideas about the role and reach of research activity have remained constant over the past seventy years.

A Laboratory Landscape

Our study is unique in that it covers such a large area over an extended time period in contrast to the majority of published ecology studies, which were small-scale in space and time. . . . [But] using simple, low-cost technology is not an intervention that works everywhere, careful consideration needs to be given to the habitat characteristics responsible for the proliferation of malaria vectors.

—Majambere et al., “Is Mosquito Larval Source Management Appropriate for Reducing Malaria in Areas of Extensive Flooding in The Gambia?”

In an air-conditioned conference room at the Bill and Melinda Gates–funded Centre for Innovation against Malaria (CIAM), Lamin Jarju presented the findings of his masters of science thesis to an audience of donors, scien-

tists, policy makers, and health practitioners.²⁴ A former data entry clerk at the MRC upcountry field station in Farafenni, Lamin had been selected to pursue a course in entomology at Durham University (UK) as part of a capacity building scheme built into a large-scale malaria control study funded by the U.S. National Institute of Health (NIH). The LCP, conducted between 2003 and 2008, aimed to reduce the incidence of malaria through the application of microbial larvicides to the landward edges of upcountry floodplains. Lamin's research explored one aspect of larval control: the impact of concrete bulwarks (or bunds) intended to prevent soil erosion and flooding on mosquito breeding grounds. Constructed in the early 1980s, the network of bunds was one of several agricultural projects funded by the International Foundation for Agricultural Development (IFAD), a UN investment scheme that granted direct support to communities by bypassing state bureaucracy.²⁵ Over the course of a year, Lamin had traveled across the country, undertaking the arduous task of collecting and analyzing samples from the water pooled around the embankments. His findings revealed that while reducing the salinity of low lying fields, the bunds also served as ideal breeding grounds for *Anopheles gambiae*, the most common malaria vector (Jarju 2008). Lamin concluded his talk with an admonition to the attending governmental ministers: "Healthy nation breeds wealthy nation: the Gambia's future depends on agricultural policy and malaria control working hand in hand."²⁶

Lamin's rephrasing of a quintessentially modern governmentality is provocative.²⁷ Considering the MRC's remit to generate scientific insights of international relevance and the role of foreign bodies in agrarian reform, calibrating Gambian health and wealth hardly seem affairs of the state (e.g., Hansen and Stepputat 2001; Sharma and Gupta 2006). The trajectory of malaria research in the Gambia underscores that disjuncture between expert knowledge and national concerns. One of the more intractable public health problems, malaria intersects with housing, urban infrastructure, and rural development—the disease is a matter of governmental capacity (Suffian 2007). However, since the 1950s, global health policies have worked to disentangle malaria control from social and economic progress. Albeit in different ways, mid-century and contemporary eradication campaigns emphasize innovation in prevention, privileging the transfer of technology over building local capacity (Kelly and Beisel 2011).

Returning to a strategy neglected for the better part of the century, the LCP's investigative focus on environment management was a massive under-

taking. A public health anachronism, the project aimed to situate malaria control within the specific ecological setting of upcountry Gambia. Because larval habitats are transient and unpredictable, the LCP required exhaustive and continual surveys of the experimental site, an area of approximately four hundred square kilometers along the north and south banks of the river (Majambere et al. 2007). In 2004, two years before the application of larvicide was to begin, the principal investigator, Steve Lindsay—a professor of vector biology at Durham University—hired four technicians from the National Malaria Control Programme (NMCP) and, in a small pilot area bordering the MRC’s upcountry Farafenni field station, trained them to recognize larval habitats, identify mosquitoes, and use compasses and handheld Global Positioning Systems (GPS).

To gather baseline entomological data, the intervention area was divided into four zones, roughly one hundred square kilometers each, and surveyed continuously during the rainy seasons of 2004 and 2005. With villages located from one to eight kilometers from the river, the zones encompassed a wide range of micro-ecologies, including grassland, stream fringe, rice fields, and mangrove forest. Over the course of two years, monthly visits were made to each of 1,076 semipermanent water bodies identified during surveys. On these visits, the surveyors were asked to describe water bodies (noting temperature, pH, salinity, depth, and surrounding vegetation), to sample habitats for the presence of larvae, and occasionally to catch fish and frogs so that the contents of their guts could be examined at the lab.

When spraying began, surveillance intensified. The LCP used a species-specific, nonresidual microbial insecticide, Bti. While highly effective in killing mosquito larvae, Bti passes quickly through the ecosystem and must be reapplied on a weekly basis; spraying, therefore, required considerable and consistent manpower. Rather than hire fieldworkers from the coast, Silas Majambere and Margaret Pinder, the LCP’s implementing scientists, recruited sixty Gambians residing in each of the four LCP intervention zones. After a month of training, the group was broken into teams of three to four spray men each led by a NMCP supervisor. Five days a week, from seven in the morning until one in the afternoon, the team would walk abreast, across two kilometers-long transects, spreading Bti from the buckets strapped to their necks.

The advantage of enrolling residents as spray men was their familiarity with the landscape. The challenge was reorienting that awareness for the purposes of larval control—as Steve put it, “learning to see the breeding

grounds from the swamp.” Initially, this proved difficult. *Anophelese* mosquitoes typically breed in sunlit pools that require no greater depth than a footprint filled with rain. Further, there was a great deal of acreage to cover; finding all the potential habitats required meticulous and intensive attention. Further, because this was an experiment and not a program, these men were not hired for their services but compensated for their volunteered participation. While the money was good—roughly 150 dalasi or US\$5 a day—the participatory emphasis of the project made it difficult to enforce rigorous quality controls or to replace people who seemed less up to the job. The arduous task of traversing large swaths of muddy landscape, carrying buckets, larvae dippers, maps, and heavy spray packs was exacerbated during the rainy season. When the routine application of larvicide was most critical, the swamp pools were at their greatest depth. The spray men, who, for the most part, could not swim, were reluctant to wade into water above their knees. To identify any habitats that might have been missed, Steve enlisted officers from the NMCP to conduct random spot checks of water bodies in the days following weekly application.

Recruiting spray men locally was risky. Indeed, when it became clear that larval control would not work in this environment, the spray men’s lack of experience was cited as one of the contributing factors (Majambere et al. 2010). However, participation was central to the LCP’s methodology. Rather than merely trialing intervention, the experiment was designed to produce knowledge about a specific policy; it was a pilot study for incipient government programs. What was on trial was a community-led system of management: could the training of local spray men be eventually extended to a nationwide, state-led disease control program? Like the Gambia Experiment, the LCP aimed to preempt the problem of sustainability by grafting the method to the context of intervention and thus generate social and technical links between the test setting to a future government intervention (Lezaun and Millo 2006).

Also like the Gambia Experiment, the LCP was a public health project: the value of its intervention was linked to its clinical effectiveness. To demonstrate the impact of larval control on the incidence of malaria, the LCP team enrolled eight hundred adults and two thousand children, aged six months to ten. In addition to a biannual collection of blood samples, a nurse and a fieldworker were stationed in each zone to monitor the participants’ health, record all cases of malaria, and provide on-site care at any hour. Village health workers (VHWS) were a critical component in this surveillance

strategy.²⁸ Initiated by the WHO's Alma Ata Declaration (1978), VHWS were intended to offer an administrative bridge between government structures and citizens (Gilson et al. 1989). In the Gambia VHWS are selected by village development committees, a volunteer body intended to encourage civic engagement, and are given six weeks' training in preventative and curative medicine (Davis, Hulme, and Woodhouse 1994). Perceived as a panacea for a weak and underfunded health system, the VHWS receive no payment from the state but rather nominal compensation from members of the community who seek their care (Menon 1991). Occasionally VHWS are hired by MRC projects to serve as reporters, informing researchers of cases occurring in their villages that might be relevant for specific investigative purposes.

In the context of the LCP, the VHWS' role surpassed that of reportage. The protocol described a partnership between VHWS and nurses, the latter providing diagnostic support and pharmaceuticals and the former responsible for treatment. The advantages of enrolling VHWS were similar to those afforded by the local spray men: the VHWS' familiarity with their communities bolstered the empirical capacity of research. However, the VHW clinical skills were found wanting. Few were able to read and write; fewer still had any formal education. Moreover, as opposed to the traditional birth assistants (TBAs) who occupied a social role as healers, the VHWS were a new actor in the village political ecology (Cham et al. 1987). The ambiguous position of the VHW between the government, community, and the MRC meant that often, rather than facilitating community access, the VHW entrenched distrust of research, leading to high dropout rates.

Though it posed clear challenges, the VHW-MRC nurse coalition was an investigative priority. At the start of the rains, LCP staff ran a series of workshops in conjunction with the relevant district health teams to retrain VHWS to treat and recognize the signs of malaria. The LCP team devised a three-part treatment strategy, whereby participant mothers were asked to approach project nurses when their children fell ill. Following diagnosis, the nurse would issue the mother a prescription slip to deliver to the VHW, who would issue drugs given to them by the project at the start of the trial.²⁹ While seemingly convoluted, the system was unilaterally popular. The MRC nurses claimed that VHWS enabled them to reach more patients; the VHWS believed the support from MRC nurses reinforced their practice; the villager residents, who enjoyed continual access to health care, found their children's health, and that of their community, dramatically improved (Kelly 2011). Embedding the experiment within the local health care infrastructure also

had positive implications for the trial. The participants regarded the study positively and, consequently, accommodated the spray men on their lands and brought their children to have their fingers pricked on blood-sampling days.

Through the alignment of local and scientific knowledge, the LCP transformed villages and flood plains into venues of knowledge production and disease management. In the project the boundaries between social and scientific orders were porous—the experimental entanglements between local actors and research institution reformatted the public dimensions of health. Again, like the Gambia Experiment, the LCP impact on the community was registered directly, through extension rather than via policy recommendations. However, despite its impressive operational successes, the LCP did not result in a reduction in malaria infections. The relatively stable transmission rate had less to do with the competence of the spray team—after two years of spraying, the presence of *Anophelese* larvae had dropped by 92 percent—than the rather surprising capacity of mosquitoes to fly great distances from areas not covered by the experiment. In the Gambian floodplains whether or not community-led, manually applied larval control was effective could not be demonstrated experimentally. Here, larval control would only work comprehensively, on a national scale: “in areas with extensive flooding, such as river floodplains and major areas of irrigated rice, significant impact might only be achieved with aerial application because large areas can be treated rapidly at full coverage” (Majambere et al. 2010, 183).

These conclusions—along with the results of Lamin’s thesis—were presented during the meeting at the CIAM in July 2007. The LCP’s negative results and Steve’s recommendation to fund for an area application of Bti provoked little response. What interested the audience, particularly those in the Health and Agricultural Ministry, was the connection Lamin drew between farming techniques and malaria incidence. His presentation sparked a heated debate on the state of the agrarian economy under Yahya A. J. J. Jammeh—the Gambia’s president following the 1994 military coup. Those critical of the president’s development strategy claimed that rice production had fallen dramatically in the last decade and its increasing reliance on technical assistance from Taiwan had failed to yield any real improvements. Proponents of his policies insisted that Taiwanese-sponsored projects had helped the farmers produce more than 10,000 tons of high quality and high-yielding rice yearly. Further, the secretary of state for agriculture, Kanja Sanneh, revealed that the government of Taiwan was prepared to send the Gambia

eight tons of DDT as soon as it received a detailed plan from the government for its domestic application. He suggested that the focus of the meeting shift from discussing completed projects to how the MRC and the National Malaria Control Program (NMCP) might take advantage of this opportunity.

As the LCP disseminated its results back to the participant communities, the NMCP, under the behest of President Jammeh, made preparations to target 80 percent of households in the Gambia as the first step in the newly launched, nationwide campaign—Operation Eradicate Malaria. Lamin, who was made a senior officer at the NMCP, enlisted the LCP research team's support in training a new squadron of spray men in the handling and distribution of DDT. In turn, Margaret, Silas, and Steve secured a grant from the MRC to conduct a randomized controlled study on the effectiveness of the spray campaign and whether it provided any additional protection over the current best practice of long-lasting insecticide-impregnated nets (LLIN). Continuing the work begun by the LCP, the new research project (SANTE) has set aside resources to train the VHWS in the use of rapid diagnostic technologies (RDTs) for detecting malarial parasites. However, though their salaries will be paid for through the research project, this time, the spray men will be government employees.

The trajectory of the LCP reveals the ways in which governmental policy and scientific practice intersect in the Gambia today. Though the research conducted under the auspices of the LCP aimed to generate data of global significance, its experimental practices animated government infrastructure. That this experiment-policy overlap was extended after the LCP was deemed a failure makes the pragmatic potential of the project all that more striking. As contributors to this edited volume show, contemporary public health in Africa is characterized by deterritorialized modalities of governance. Funded by private partners, nongovernmental agencies, and transnational bodies, medical research and therapeutic care no longer exist in a space characterized by the “public”; the nation-state, therefore, seems an inappropriate category for conceptualizing biopolitical life (Ferguson 2006). And yet in the context of the LCP, the state continues to operate as a significant imaginary. Here, research emerges as an awkward form of stewardship. As soon as it ended, the LCP was reformulated to respond to the interlocking commitments of the international scientific community, the economic and political interests of governments, and the health of the population.

In pointing to the ways in which international research can become enrolled in national projects, I do not mean to suggest that scientific and

governmental practices are in any way isomorphic. Despite its investigative focus on public health management (and here, perhaps malaria control presents a particular case) the primary aim of the LCP was to publish papers, advance the careers of scientists, and generate further funding for research. Whatever improvements it affected through its implementation, the aim of the experiment was not to transform the lives of Gambians as a population. Launched in 2009, SANTE has accentuated that discrepancy. The experiment initiated the national distribution of bed nets, with the understanding that the government would wait on spraying after initial results were generated. But under the time pressures of Operation Eradicate Malaria, the NMCP spray teams ignored SANTE's randomized design, which requires that particular villages be left unsprayed. As Margaret struggles to reformat the experimental protocol so that it can demonstrate the relative effectiveness of the campaign, Jammeh's malaria eradication plan will be scaled up to include all inhabitable houses, but as she points out, without a clear sense of best practice. Once again, the scale of the experiment does not correspond to the needs of government policy.

The campaign marks a critical shift in the history of research in the Gambia. While the MRC has held the monopoly on malaria research and control, recently health has become a charged domain to exercise and demonstrate state power. The question that faces the research community today is what this repoliticization of the bioscience means for the MRC.

Experiments and Exit

Sir, presidents come and presidents go, but the MRC is for the people of the Gambia.

— Sir Christopher Booth, 1981, in Reynolds and Tansey, *British Contributions to Medical Research and Education in Africa after the Second World War*

Though the team did not know it then, the LCP was one of the last trials to be hosted in the Farafenni MRC Laboratories. In February 2009, the country-based MRC staff and scientists were informed that head offices in London had shifted its vision: rather than focus its investments in the Gambia, the MRC would support regional collaborations across West Africa. In addition to closing Farafenni, the MRC will cut the Gambia's budget in half over the next five years. The rationale is to allow MRC researchers to investigate a greater number of people in diverse circumstances and thus enhance the generalizability of their research and the speed at which it is conducted.

In a closing ceremony, the MRC donated the station to the University of the Gambia's School of Medicine and Allied Health Sciences. While heralded by the MRC as a new chapter in a long-standing partnership, this plan has not been well received by Gambians. The former head of Farafenni station, now paid to monitor the empty buildings while the university figures out what to do with them (and how much it will cost), has received hundreds of letters from neighboring villagers protesting the closure. "For the most part," he said, "these people feel abandoned. Some feel betrayed. They had participated with the MRC because they believed it was a lasting commitment."³⁰

The MRC's decision to pull out of the Gambia characterizes the contemporary biopolitical regime: extending its reach across state spaces, the MRC laboratories in the Gambia will form just another island in the "archipelago" of international scientific activity (see Geissler, introduction in this volume). If anything, the MRC's long-term commitment to the Gambia is anachronistic. Today, research has less and less to do with specific places than with experimental networks. However, what is particular to the Gambian case is that the MRC's shift in policy is coterminous with Jammeh's increasing interest and involvement in public health issues. More notorious than Operation Eradicate Malaria is the president's claim that he can cure AIDS through a fusion of traditional healing and Koranic-inspired therapies. To administer this "national cure," Jammeh took over a hospital built with foreign donations and enrolled hundreds of HIV patients, who were promptly taken off their ARVs. For criticizing this therapeutic strategy, the president has expelled or detained foreign officials and nationals (Cassidy and Leach 2009). His speech to the Sixty-Fourth United Nations General Assembly in 2009 outlined his position:

HIV/AIDS, malaria, tuberculosis are killer diseases. While I would like to reiterate my delegation's support for the work of the Global Fund to fighting these diseases, I wish to call for concerted efforts at resource mobilization to support international research on traditional medicine and alternative diseases treatment programs. These traditional systems are in most instances more cost-effective, yet abandoned for the sorts of criticisms that come from multinationals who feel threatened that certain traditional breakthroughs would be detrimental to their corporate existence and interests. These multinationals value their monetary gains more than human life. They should not be allowed to hold humanity for ransom. Their insatiable appetite for massive wealth at any cost has pushed them

to the point of blindness and insensitivity to human suffering and loss of human life in the developing world, especially in Africa.³¹

According to Jammeh, the pursuit of health and wealth short-circuits the well-being of Africans, a biopolitical arrangement that he will aim to undo. Though his methods are reckless and his regime repressive, Jammeh's decision to flex national power through therapeutic practice makes political sense, particularly against the *longue durée* of biomedical intervention in the country. In their analysis of Jammeh's motivations, Cassidy and Leach (2009, 561) suggest that "they can be read, in part, as a consequence of global scientific governance: as backlashes which contest its power." In other words, Jammeh's "cure" is a way of wrestling back sovereign power from the grasp of philanthro-capitalist visions of "grand health challenges."

The MRC's response to Jammeh's assertion has been muted. Their silence can be read as either a pragmatic effort to protect their HIV research activities or as an ideological stance regarding institutional integrity and its distance from political affairs, articulated by Christopher Booth (quoted in Reynolds and Tansey 2001, 38) in the quotation above. Whatever the logic, the MRC is finding a way to disentangle its operations from the political context of the Gambian state, completing a process of separation that began seventy years ago.

Notes

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- 1 Immediately following the independence of Senegal from France in 1960, the British attempted to develop a formal association—Senegambia—to bolster the Gambia's economy, taking some of the financial pressure off the UK. While Senegal had several reasons to support a fuller integration, including clamping down on smuggling and securing its own political security against the more radical West African governments, for the Gambia, the advantages of being absorbed into another country with a different language, ethnic composition, and higher tariff structures were less clear. The Gambia government rejected the UN's recommendations for a merger and in 1965 the British agreed to grant the Gambia independence regardless of any agreement reached with Senegal. The Senegambia Federation was briefly reinvigorated in 1982, when President Jawara asked for support of the Senegalese army to suppress a coup, but ultimately dissolved six years later after conflicts over the degree of military support

- provided by the Gambia to Senegal. Under the current president, Jammeh, relations have soured further, as he is believed to be supporting rebels in the southern Senegalese district of the Casamance (Hughes and Perfect 2006, 254–59).
- 2 For instance, to prevent direct competition with hospitals for labor, the MRC will only hire clinical staff six months after they have terminated their governmental appointments. Because nurses are only contracted by particular research projects, this policy places nurses in a precarious situation, whereby they might work for the MRC for twenty years or more but only in erratic two- to three-year stints.
 - 3 Sir Ian McGregor comments: “So much research depends, in its interpretation, on accurate knowledge of vital statistics of the communities under study—birth rates, death rates, the effect of season on these particular rates, how individuals grow, what is the nutritional status, what are the standards. In the years following the Second World War such information did not exist for communities in rural areas in West Africa. . . . There was a need to create a facility whereby this information could be supplied accurately. We tried to do this in the Gambia through long-term studies investigating a series of villages” (Reynolds and Tansey 2001, 24).
 - 4 Though the Gambian population is not as genetically homogeneous or isolated as the Icelanders (in the late 1990s, DeCode Genetics, a start-up genetics company, endeavored to combine the genetic identity of the population of Iceland into a single database [e.g., Pálsson and Rabinow 1999]), its significance for the biomedical research enterprise can equally be understood in terms of the completeness and accuracy of its epidemiological history.
 - 5 Though the Gambia only became a colony in 1893, Great Britain administered the territory surrounding Bathurst since the early 1820s, immediately after it had founded the city. For the latter part of the nineteenth century, this cluster of land was administered from Britain’s more important possession Sierra Leone. Because the British government would not provide any financial support outside of military costs, Bathurst was built with revenue derived from tax on imports (Gailey 1964, 37, 62–65).
 - 6 By the mid-seventeenth century, indigenous rice seeds had been replaced by Asian varieties (Wright 2010, 81).
 - 7 Over four hundred Gambians served in the British West African Frontier Force, which was stationed in East Africa during the war (Gray 1940, 485).
 - 8 The subsequent tightening of boundaries between the Gambia and Vichy-ruled Senegal during the Second World War added further strain to the groundnut market, as it brought a halt to the seasonal migration of workers from neighboring territories—“strange farmers” (*samalaalu*)—upon whom groundnut production had come to depend (Webb 1992).
 - 9 Following the Second World War, the British were also under considerable pressure from the international community to improve the situation of colonial subjects, a point explicitly raised in connection to the Gambia, which Franklin D.

Roosevelt described to Churchill as “that hell-hole of yours called Bathurst” (Wright 1995, 47–58).

- 10 Motivated by concerns over Britain’s unemployment, the primary aim of the 1929 act was “to aid and develop agriculture and industry in the Colonies, Protectorates and Mandated Territories, and thereby promote commerce with or industry in the United Kingdom” (Colonial Office Memoranda, 1921, quoted in Meredith 1975, 486). The act of 1939 also wrote of over eleven million pounds of debt incurred by colonial governments.
- 11 The protectorate was, for the most part, left undeveloped and, as it was never entirely certain that the colony would stay in British hands, reluctant to invest in any public works or infrastructural improvements that would ultimately be to a French advantage. In 1925 the total budget for the Gambia was £273, 284, and only £13,996 was budgeted directly for provincial administration (Gailey 1964, 234).
- 12 The Department of Agriculture, established in 1924, conducted experiments in diversifying agricultural production throughout the 1930s. These attempts had largely been unsuccessful, for despite efforts to encourage farmers to plant other seed varieties or pursue other crops, groundnuts remained the most lucrative—if not always stable—form of income (Gailey 1964, 144).
- 13 *The Gambia Experiment* (Berry 1998), edited and published by the wife of the team leader, Dr. William Berry, describes the last of three surveys conducted under the direction of Human Nutrition Research Unit and funded by the Medical Research Council.
- 14 Tested through a series of “wall building trials,” described by Berry: “In one such test seventy-five hours were spent building twelve-foot-high walls, over a period of ten days, with a gang of six Africans working on contract. African compared favorably with the European,” Report May 1947–1948, in Berry (1998, 44).
- 15 The extension of the experiment from rice to all crops commonly grown in the Gambia—and, in particular, groundnuts—was the explicit recommendation of the Colonial Office, which felt it necessary to ensure that nutritional investigations addressed economic output (Berry 1998, 23–24; 33–35).
- 16 W. T. C. Berry and A. H. Bunting, 1946, “Suggestions for a Field Working Party in Gambia Protectorate,” in Berry (1998, 25). Bunting had previously worked at the Rothampsted Experimentation Farm in Harpenden, Hertfordshire (1940–43), where R. A. Fischer had recently developed and piloted the experimental design for randomized controlled trials.
- 17 Kenneth L. Little, April 1, 1948, Report on a visit to the Gambia in connection with the appointment of a Sociologist to the Nutritional Field Working Party: “its significance so far as the sociological process of ‘grafting’ new methods of life and organization on to the old, may not be conclusive, but its real value will undoubtedly lie in demonstrating what potentially can be achieved in terms of social and nutritional improvement as a result of much increased agricultural productivity. There may still remain, therefore, the fundamental problem, be-

- cause the ultimate success of all such developmental work depends upon the community itself shouldering responsibility for the necessary changes, expansion and social improvement” (quoted in Berry 1998, 169).
- 18 Both of these projects ended in disaster; the losses were a source of considerable embarrassment for the Colonial Office (Cohen 1984, 68–70).
 - 19 Margaret Haswell continued to conduct detailed research on the socioeconomics of Genieri over the following decade.
 - 20 This interpretation that at the basis of problems was the individualist farmer tallies with the commonly held belief on the part of the Colonial Office of the disjuncture between developmental schemes and local practices. As Raymond Firth writes: “Much experiment, demonstration, and extension work has been carried on, and some of the results . . . have been very fruitful. At the same time one is forced to the conclusion that the response of the African farmers has been extremely slow; that the vast majority of them are not convinced that the methods advocated by government are capable of being applied to their own circumstances” (Firth 1947, 78).
 - 21 For a discussion of how the MRC gained a foothold in tropical medicine despite the efforts of the Colonial Office to retain control of the research facilities, see Sir Ian McGregor’s comments in Reynolds and Tansey (2001, 20–24).
 - 22 Roger Whitehead, MRC unit director in Kampala, 1959, recalls: “In general, the MRC were more interested in fundamental research, developments of importance to fundamental science. . . . I think the MRC’s record in Africa, when viewed internationally in terms of contributions to international science, is pre-eminent. Perhaps in terms of applying that knowledge, the MRC’s record was not so good” (Reynolds and Tansey 2001, 58).
 - 23 According to Foucault (2007, 18), biopolitics is a matter of achieving equilibrium between people and available resources by “organizing circulation, eliminating the dangerous elements, making a division between good and bad circulation, and maximizing the good circulation and diminishing the bad.” Science, Foucault suggests, becomes the instrument through which these complex adjustments to the dynamics of exchange, accumulation, propagation, and sanitation are made, rendering the population intelligible for management.
 - 24 The CIAM is one of four training centers built by the Gates Malaria Partnership in Africa intended to strengthen public health services by forging links between international and national researchers, funding bodies, policy makers, and health practitioners. The relationship the CIAM poses between science and government is one of infrastructural stimulation: “with its roots embedded in human resource strengthening,” the CIAM hopes to reduce malaria through “equipping individuals and communities with the necessary skills”; see the CIAM website: www.ciam.gm.
 - 25 The scheme has come under scrutiny by the IFAD (2005), whose evaluation of projects funded in the Gambia described the bunds as “in need of refashioning” and “only half-done” because—and here the report echoes the Colonial Office’s

comments about rice schemes in the 1950s—“the villagers have no real sense of ownership of the schemes . . . they await the next dose of help and seem unwilling to take any initiative themselves” (IFAD 2005, 21).

- 26 CIAM research meeting, July 14, 2007.
- 27 In a Foucauldian sense, Lamin’s thesis is an exemplar of the tête-à-tête of truth and the art of government (Foucault 2007). However, whereas Foucault grounded his analysis of governmentality in the context of European nation-states, the interventions Lamin describes are predicated on a political economy shaped by colonialism and forged through the global development regime.
- 28 The concept of the vhw was made famous by the Chinese barefoot doctor program, which made use of village volunteers as health auxiliaries in the mid-1950s. The dramatic success of this program inspired a number of other countries to follow the Chinese example, particularly those with large underserved areas and where the political agenda centered on eradicating social inequities.
- 29 As vhw’s were, for the most part, illiterate, to ensure the accurate delivery of medicine at appropriate doses, treatment sheets and prescription slips had pictorial representation (e.g., suns for chloroquine and stars for fansidar).
- 30 Interview with author, May 25, 2009.
- 31 President Jammeh’s Address to the General Assembly of the UN, September 24, 2009. <http://www.un.org/en/ga/64/generaldebate/GM.shtml>.

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