Water Marginalised?

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Abstract[1]

Water can produce both favourable and unfavourable health outcomes. As this has been well known since the mid-nineteenth century, the following question arises: why did many polities across the world struggle to commit to improving water supplies and sanitation in the twentieth century? My research explores how the marginalisation of water within the fragmentary structures of imperial and international policy making shaped commitment (or lack thereof) to developing water supplies and sanitation facilities in twentieth-century Africa. By exploring how administrators and scientists did or did not conceptualise water as a key public health issue—and how this framing shaped imperial, colonial, national, and international health policy—we can better understand water's marginalisation in twentieth century health discourses. Researching at the Rockefeller Archive Center (RAC), I sought to better understand the role of Rockefeller Foundation, Near East Foundation, and Ford Foundation officials and associates in conceptualising the relationship between water and health, and between water and development, particularly in relation to the Sudan and Uganda. This report will focus primarily on the work of Rockefeller Foundation officials and associate researchers between c. 1925 and 1940. It also draws from papers held by officials and associate researchers, which were written for, or on behalf of, the League of Nations Health Organisation or the British Colonial Office.

Literature Review

The acceptance of germ theories of disease and discreditation of older environmental conceptualisations of disease in the nineteenth and early twentieth century had a significant impact on the development of water supplies and sanitation as public health interventions. Priority was given to understanding the causative agents of disease alongside the development of vaccines and chemical prophylactics. The rationale behind this move was, at least in part, to prioritise the development of cheaper measures with short term returns—"magic bullets"—to maintain people's health. Water supplies and sanitation systems were often larger-scale infrastructural developments, where the main benefits were realised in the long, rather than short, term.

The period between c.1880 and 1930 has received significant scholarly attention regarding European engagements with medicine in colonial territories. However, there is still a gap in our understanding of the preventive public health measures that were suggested, developed, and implemented in colonial territories. Exceptions that focus on the preventive strands are mostly concentrated in the nineteenth century or in the 1930s, with the rise of social medicine.[2] Preventive measures were most usually regarded as either secondary to curative measures or deemed impractical, due to the financial burden and finite access to personnel and materials.

Equally, water does not figure heavily in scholarship on international health organisations, such as the League of Nations Health Organisation (LNHO) or the World Health Organisation (WHO), nor does it have a prominent place in the scholarship on other philanthropic organisations, such as the Rockefeller Foundation and the Ford Foundation. This gap is particularly noticeable in the fifty years between c.1920 and 1970.

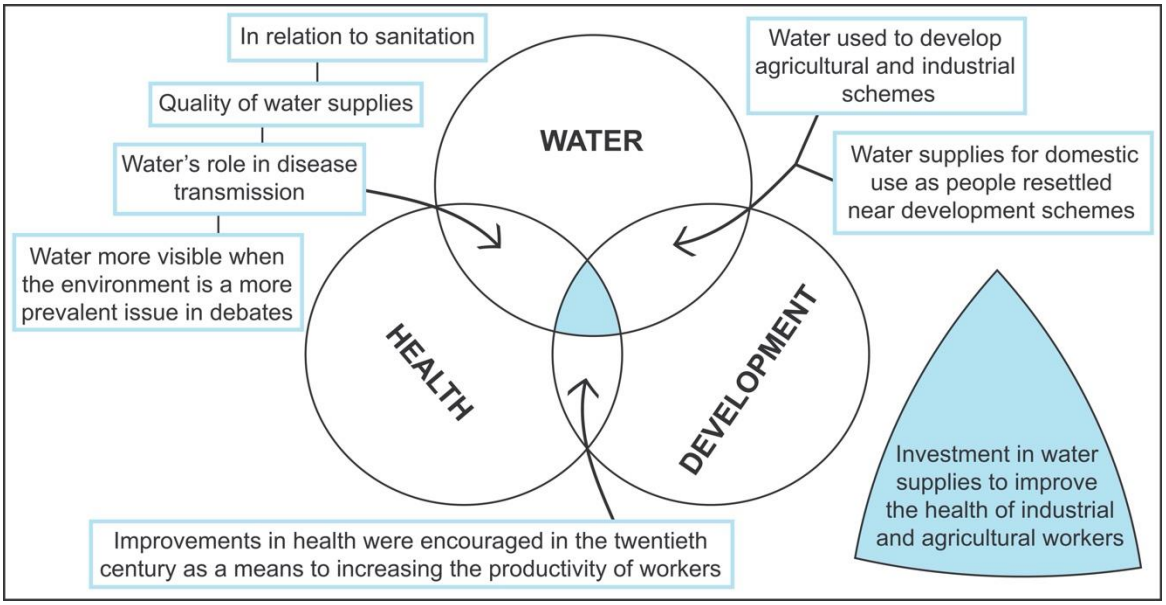
Water has not been considered in much depth within the development literature and, in general, historians have not engaged with the way that decisions about spending on development programmes could be informed by costs. Water is considered in greater detail in relation to the development of dams and irrigation

works, but water, as it related to public health (in a development context), has a lesser role in this literature.

Background and Methodology: Finding Water in Health & Development Discourse

Developing a clear picture of how people thought about and engaged with water is problematic due to bureaucratic fragmentation. My research traces the transmission of ideas about the link between water supplies, quality, and health and their entwinement in discourses not directly related to health (Figure 1). Regarding water in health discourses, my research explores two avenues. First, how people in the twentieth century sought to combat particular diseases and, second, programmes or concepts that incorporated the development of water supplies.

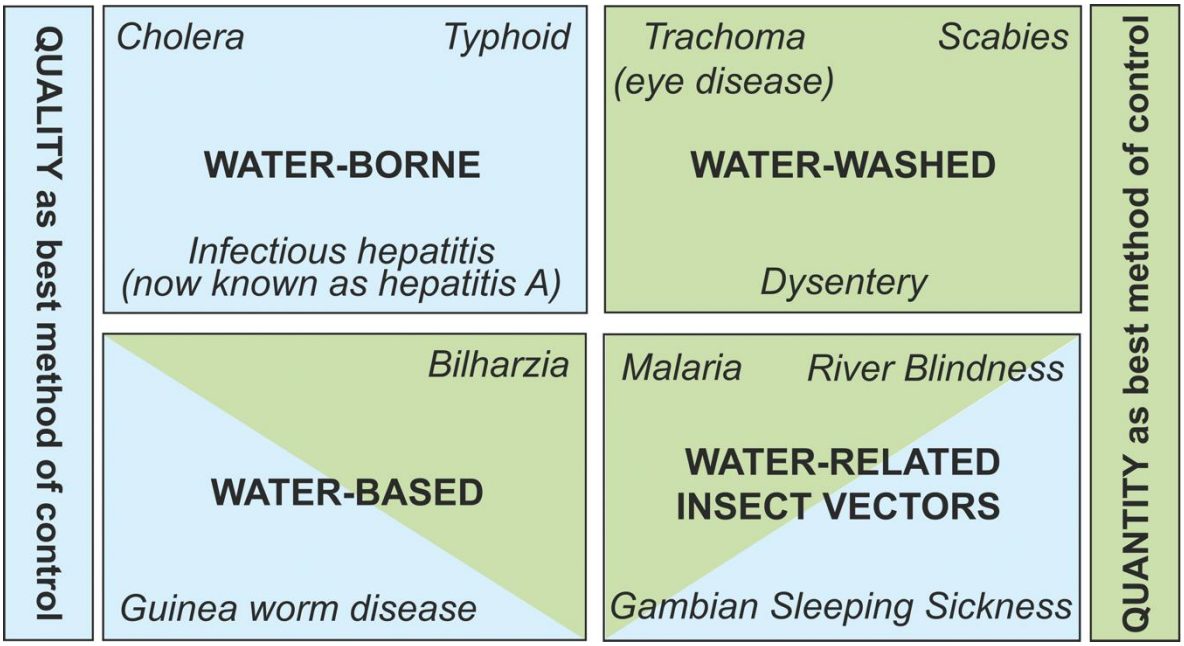
Figure 1: Discourse Convergence



Source: Created by Joanna Lunt Greenfield (2019).

The first avenue looks at how people in the twentieth century conceptualised and sought to combat particular diseases. Here, my research begins with David J. Bradley's re-classification of disease based on their transmission routes, as shown in Figure 2. This research is particularly interested in how Bradley's classification can be used as a framework for exploring how people conceptualised disease in the twentieth century.

Figure 2: David Bradley's Classification of Diseases Related to Water



Source: Diagrammed by Joanna Lunt Greenfield (2016) using White, Bradley, and White, Drawers of Water.[3]

The second avenue considers the sorts of programmes developed, and concepts used by the Rockefeller Foundation that may have included a water supplies element. Examples include the promotion of rural hygiene by the RF and the LNHO in the first part of the twentieth century (c. 1913-1945), the development of environmental sanitation/hygiene through the World Health Organisation (WHO), and, latterly, the UNICEF/WHO Primary Health Care programme.

In addition to exploring the ways in which people associated with the Rockefeller Foundation considered the role of water in relation to health, this research seeks to open up areas for further research, such as the role of water in wider

development activities (e.g., food production and education). My interest in water in a development context is first focused on understanding whether health or social aspects were considered in conjunction with agricultural development programmes; and second, how conceptualisations of the relationship between water and development affected the prioritisation of improving water supplies for maintaining and improving people's health.

Water and Health

The Rockefeller Foundation (RF) was established in 1913 and has since funded domestic and international health and development work. From the 1920s to the mid-1940s, the International Health Division (IHD) was particularly interested in understanding diseases—their causes, their methods of transmission, and ways to effectively control and eradicate them. RF involvement on the African continent, however, was limited in the first half of the twentieth century. In the 1920s and 1930s, the support that the RF did provide on the African continent was largely restricted to understanding and combating a small selection of diseases: hookworm (in Egypt), yellow fever (particularly in West, and then later, East Africa), and sleeping sickness. The Rockefeller Foundation worked in association with the League of Nations Health Organisation or through cooperation with national and colonial administrations. The RF's reach rarely extended to Sudan and Uganda until the 1930s, when cooperation between the IHD and British colonial administrations established a centre for yellow fever research in Entebbe, Uganda; this acted as a research base for isolating the yellow fever virus in East and Central Africa. Other regions, such as South America, received much greater RF support.[4] The reasons for this were twofold: many officials in Britain wanted to limit international influence in its colonial territories and African territories did not hold the same political importance for Britain as territories in Asia (and for the RF as South American countries).

I: Defining Diseases

This section explores ways in which water entered (or did not enter) the discourse in relation to a selection of diseases: sleeping sickness, yellow fever, malaria, and bilharzia. In David Bradley's reclassification of diseases by their transmission route, only Gambian (and not other strains of) sleeping sickness was mentioned under "water-related insect vectors." However, research to understand the role of water in the disease cycle was still ongoing in the early twentieth century. Yellow fever did not figure in Bradley's reclassification, but early twentieth century attempts to isolate the yellow fever virus included the collection of data regarding mosquito larvae in plant axils. Consequently, this section analyses some of the reports and correspondence regarding sleeping sickness (1920s and 1930s) and yellow fever (1930s and 1940s) to better understand how research undertaken in the first half of the twentieth century shaped the ways in which these two diseases were conceptualised and combatted. It also explores discussions to fund international research and interventions to combat malaria (1920s and 1930s) and bilharzia (late 1930s). Malaria and bilharzia both figured in David Bradley's reclassification of diseases by their transmission routes under "water-related insect vectors" and "water-based" headings respectively. Both malaria and bilharzia had more concrete connections with water than yellow fever or sleeping sickness, but international efforts to combat these two diseases did not often include Uganda or Sudan in the first half of the twentieth century.

I.I: Sleeping Sickness (Trypanosomiasis)

The research laboratory in Entebbe (Uganda) was the focal point for LNHO and RF investment across East Africa from the mid-1920s to the early 1950s and primarily addressed sleeping sickness and yellow fever. The laboratory underwent several name changes, as research priorities shifted between the mid-1920s and the early 1950s. It began as a sleeping sickness laboratory, which facilitated sleeping sickness commissions in the 1920s; this was LNHO-sponsored. It was converted into a yellow fever laboratory in the mid-1930s, supported by RF

personnel from 1936 and small financial donations following the outbreak of the Second World War. The Institute expanded its remit and was renamed the East African Virus Institute in 1950; RF continued to provide funding until 1952.[5]

The League of Nations Health Organisation provided a forum, which encouraged and enabled its member states, such as the European imperial powers, to undertake joint efforts to control diseases across borders.[6] As a result of the first international conference on sleeping sickness in 1925, the LNHO's first major initiative on the African continent was the Sleeping Sickness Commission. Reliant on RF funding and thus recognising its own limitations, the LNHO prioritised focused efforts to combat specific (often epidemic) diseases in its early years. The localised nature of sleeping sickness, which affected the borders areas of French Equatorial Africa, the Belgian Congo, Uganda, and Sudan, suited what the LNHO was able to offer. Southern Sudan was initially favoured as the location for base operations but after further discussion, Entebbe (Uganda) was chosen instead due to better transport links. On 24 August 1926, Ludwik Rajchman (LNHO medical director) wrote to Professor Selskar Gunn (IHD, RF), highlighting the positive work that the LNHO was able to facilitate through cooperation to tackle sleeping sickness in Africa:

> There are problems connected with diseases of special importance to a group of countries towards the solution of which effective international cooperation can accomplish much. The sleeping sickness commission now at work in Equatorial Africa is a good example of the manner in which problems of this nature may be investigated [...] the harmony with which the work is being carried out is gratifying.[7]

The place of water in sleeping sickness research was often in relation to the collection of specimens, frequently from vegetation close to bodies of water, or the control of people's movement to ensure their separation from the tsetse flies (which were responsible for sleeping sickness transmission). An interim report in 1923, produced in advance of the LNHO conference, raised concerns that local people were not respecting cordons in place to prevent interaction with the tsetse fly. The connection between water and sleeping sickness here was in the convergence of people and flies near water sources. Special reports detailing the control and management of sleeping sickness (published in Uganda between 1926

and 1932) were also peppered with comments about the challenges of keeping people away from tsetse fly infested areas.[8]

The *Final Report on the League of Nations International Commission on Human Trypanosomiasis 1928* was, however, focused predominantly on laboratory work and patient treatment, i.e. isolating and diagnosing strains of sleeping sickness; transmission experiments; different treatments used and their effectiveness; and attempts to create and use antisera on baboons, guinea-pigs, and other animals.[9] There were only a few mentions regarding the presence of tsetse flies in vegetation near water sources and these were primarily in reference to the collection of specimens for study from lake or river shores until Dr. Van Hoof's contributions on sleeping sickness in the Belgian Congo three quarters of the way into the report.[10]

The practical recommendations at the end of the report did, however, acknowledge the importance of separating people (and livestock) from the tsetse fly, particularly the first and last of the suggested measures. These recommendations were that movement should be controlled, a thorough census of infected people should be taken and maintained, infected people should be treated, and, as a last resort, heavily infected zones should be evacuated.

The focus on developing a greater understanding of the causative agents of disease—in this case, the trypanosomes responsible for sleeping sickness—meant that references to water, in relation to sleeping sickness, were often minimal as compared with the results, analysis, and application of laboratory experiments. However, given that two of the four main recommendations of the sleeping sickness commission involved controlling the movement of people, it is clear that researchers had concerns about how people came into contact with the tsetse fly. While the tsetse fly was also commonly found in forested areas without large bodies of water in the vicinity, the maps of sleeping sickness cases recorded in the Belgian Congo suggested a correlation between bodies of water and the incidence of sleeping sickness.[11]

I.II: Yellow Fever

Following the LNHO's support to combat sleeping sickness, African health administrations were "anxious that the Health Organisation should continue its collaboration on African health problems."[12] The LNHO was keen to do so but wanted to know the "health problems in which international action was most desirable."[13] Emerging from discussions across African health administrations, yellow fever was highlighted as a problem that was suited to international and local collaboration. As such, it was given priority on the agenda of the 1932 International Conference of Representatives of Health Services of African Territories and British India (ICR). During this meeting, the Gold Coast representative, Dr. David Duff, noted that "the introduction of a piped water supply has been found to be the most effective single measure which can be applied to a town to limit breeding" of yellow fever-transmitting mosquitoes.[14] Lengthy discussions about yellow fever were also an important feature of the Pan-African Health Conference in 1935, and before returning back to the United States, Fred Soper (RF epidemiologist) visited Kenya, Uganda, and the Anglo-Egyptian Sudan.[15]

Still, the League of Nation Health Organisation faced challenges in getting some colonial administrations on board. Some British colonial officials were very responsive to the involvement of the LNHO. William Ormsby-Gore, undersecretary of state for the colonies, noted that "politically it is essential that Great Britain should support a League interest."[16] Others, such as Thomas Stanton, challenged the LNHO in its attempts to coordinate health in Africa and argued that current forums were better suited to the interests of colonial powers.[17] Rockefeller Foundation officials were pleasantly surprised, therefore, when the British Colonial Office agreed, with Stanton's blessing, to a joint venture with the Rockefeller Foundation to research yellow fever in 1936.

By late 1935, it was clear that the laboratory established for sleeping sickness research in the 1920s was no longer required.[18] Yet the sense from George Strode (head of the RF's medical and public health work in Europe, Africa, and the Near East) was that British officials still needed some convincing of the value of yellow

fever research in Africa. On 3 March, Strode wrote to Wilbur Sawyer (director of the RF's International Health Division) on this matter:

> The problem in London was to familiarize key men with the latest advances in knowledge of yellow fever, which meant from the epidemiological point of view, reviewing the dramatic story of the disease as it has been unfolded in Brazil. Not a single auditor failed to be thrilled by the narrative. The next step was to suggest those things which should be done if the African yellow fever problem is to be equally well understood. As mentioned above Dr. Soper did this to perfection.[19]

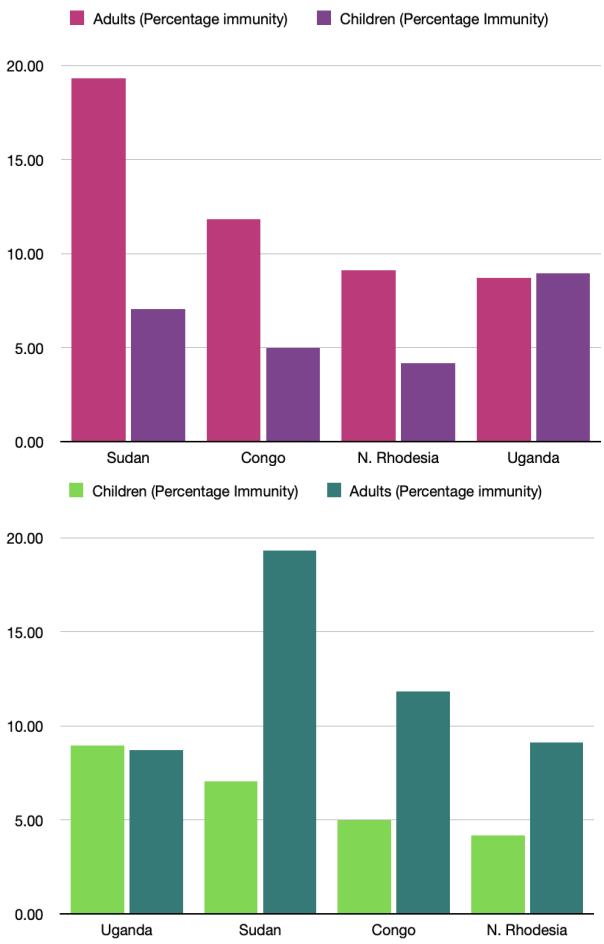
Strode continued in the letter to highlight the "outstanding importance" of getting Thomas Stanton on board. Given Stanton's strong (and often negative) views on LNHO involvement, RF concerns were well-founded. However, following "a good many hours of discourse," Stanton was "prepared, so he informed us, to authorize Uganda to go ahead or rather to accept the financial assistance Uganda offers, but lacking technically competent personnel to start the work, he has turned to the IHD to provide direction."[20]

After studies on yellow fever in Central and East Africa were agreed in 1936, researchers sought to understand the nature of the disease, how it spread, and the extent of its reach.[21] To do this, they needed to isolate the virus, which proved to be one of the biggest challenges between 1936 and 1940. During this time, yellow fever work was focused on the bordering regions of the West Nile District (Uganda) and Equatoria (Sudan). While the discovery of "two hitherto unknown viruses" in 1937 provided avenues for further research (Bwamba Fever & West Nile Virus), yellow fever cases evaded researchers.[22]

While the search for live yellow fever cases continued, immunity surveys were undertaken in Uganda, with further samples collected from eighteen other territories. As shown in Figure 3, the territories with the highest child immunity occurred in Uganda, Sudan, Congo, and N. Rhodesia and the highest adult immunity in Sudan, Congo, N. Rhodesia, and Uganda (where over 350 children or adult were tested for immunity).

Figure 3: Percentage of Child and Adult Yellow Fever Immunity (where at least 350 people were tested)

A: Adult Immunity (First to Fourth Highest)
B: Child Immunity (First to Fourth Highest)



Source: Summary Report on Yellow Fever Research 1939-1946.[23]

The immunity surveys proved that yellow fever had been present in the region, but there were still many sceptics who doubted the results. It was not until late 1940 that two strains of the yellow fever virus were isolated in the Nuba Mountains of Anglo-Egyptian Sudan. The epidemic was labelled as "the largest which has ever occurred in Africa, at least since Europeans have been on that continent," and it was noted that the outbreak occurred "during the season of

heaviest rains at a time when overland communications were most difficult."[24] An epidemic was also likely to have occurred between October 1939 and April/June 1941 in western Uganda, as people previously tested non-immune in 1939 were immune in mid-1941.

Two other research avenues were the investigation of wild animals as yellow fever hosts and the role of plant axils as breeding places for the *Aedes simpsoni* mosquito, which was found to transmit yellow fever in Africa. Regarding the latter, Mr. E.G. Gibbins' research established gonja bananas, colocasias, and pineapple as "important breeding places" of the *Aedes simpsoni* mosquito in Entebbe, Fort Portal, and Bwamba; further research undertaken by the team in East Africa supported Gibbins' results.[25] Earlier research in North and South America had also noted connections between the yellow fever transmitting-*Aedes aegypti* mosquito and water. Lewis Hackett, writing about the epidemiology of yellow fever from the nineteenth century, commented that (unlike the *Aedes simpsoni*) the *Aedes aegypti* mosquito bred only in "artificial water containers" and not in "natural waters":

> *Aedes aegypti* is very domestic in habits, breeds exclusively in and around house in artificial water containers [...] Larvae are found outside the house in cisterns, tanks, buckets, barrels, roof gutters, empty cans, broken bottles, old tires and vases of flowers in cemeteries [...] Inside the house it lays its eggs in any open receptable containing water including the fonts of holy water in churches.

The different breeding habits of yellow fever-transmitting mosquitoes highlighted the importance of different preventive measures to reduce disease incidence. While such research proved valuable in isolating the virus in mosquitos, the development of a vaccine in the late 1930s meant that priority was given to mass vaccination in the 1940s where possible, rather than focusing on preventive measures, which included improving water supplies.

I.III Malaria & Bilharzia (Schistosomiasis)

While targeted action to control sleeping sickness and yellow fever was prioritised over addressing the problem of malaria on the African continent, international discussions and personal thoughts of researchers concerning malaria highlighted some of the different ideas about combatting malaria in the first half of the twentieth century.[26] My research at the RAC found that there was a sharp distinction between American and European malariologists on how best to address malaria and the extent to which it could be controlled or eradicated in the late 1920s.[27] Commenting on the LNHO Malaria Commission's Conference in 1928, one RF researcher described the first group of largely European malariologists as believing that "conscious human effort would only hope to mitigate the severity of malaria." The researcher further noted that they had "no faith in anything but quinine," albeit with differing views held as to quinine's value as a curative and preventive measure.[28] The second group believed it possible to accelerate the "extirpation" of malaria through conscious human efforts and valued malaria control, and not quinine, as a preventive measure.[29] The diverse views expressed at the conference highlighted the difficulties in firmly establishing the best way forward: there was not "a method of choice superior to all others."[30] While some expressed hope that international cooperation in research was proving positive, others were less optimistic. As one RF participant described, "Nocht, in closing [the conference], said: 'The Conference closes an epoch in malaria. Work now to be undertaken will be done in accord and with the cooperation of all malariologists.' I am afraid he is a little too optimistic."[31] Indeed, such cooperation was not going to be easy to achieve.

In 1934, following a meeting convened by the League of Nations Health Organisation's malaria commission to discuss "the varieties of *maculipennis* [species of mosquito] and their relation to malaria," RF malariologist Lewis Hackett highlighted frustration in the LNHO's approach to the malaria problem.[32] Commenting on a meeting that took place in 1933, Hackett remarked that, "then, of course, treatment held the stage and the entomological side of malaria received

only a moment of grudging attention."[33] Hackett's letter to Frederick Russell was once again suggestive of discord and competition between malariologists. Some members were frustrated that Hackett had published thoughts ahead of the 1934 meeting; one cannot help but get the sense that this was a deliberate move by Hackett given evident irritation that the LNHO was prioritising the production and distribution of quinine over mosquito control measures.

This did not mean, however, that those who favoured the use of quinine to reduce the impact of malaria were either ignorant of the role of water in the transmission of malaria or deemed it unimportant. *Schistosomiasis and Malaria in relation to Irrigation*, a paper published in 1929 by J. F. C. Haslam and held at the RAC within the Nelson C. Davis papers, highlighted the impact water had on the incidence of malaria: "The disease cycle runs man—mosquito—man, but for continued existence and multiplication of the mosquito, and therefore for the spread of disease, water is a necessity."[34] Moreover, Malcolm Watson (director of the Ross Institute in London), commented in 1937 that the "management of water is the secret of the control of malaria."[35]

While most Rockefeller Foundation work in North Africa (in the RF files of the time, Sudan was assigned to this region) focused on research into hookworm and bilharzia in Egypt, this first section has shown some RF involvement in sleeping sickness—indirectly through LNHO commissions—and yellow fever—directly through personnel seconded to Africa. Oliver Atkey, director of the Sudan Medical Services in the 1920s and 1930s, did ask Claude Barlow (IHD), who was based in Egypt at the time, to visit Sudan to undertake bilharzia research, but Barlow's busy schedule was not permitting.[36] Barlow did write a short report on bilharzia in Sudan in 1931, but this file is limited in scope.

Increased efforts to control water and develop irrigation to improve crop yields had brought connections between water and health to the fore, particularly concerning the potential increases in bilharzia and malaria incidence.[37] In the late 1930s, Claude Barlow corresponded with Rajchman (LNHO) in support of making bilharzia the subject of international study and action, stating that "the disease is worthy of attention."[38] However, A.J. Warren (director of the IHD Paris Office)

was not convinced that the RF should get involved at this time. He noted that, "There seems to have been a great difference of opinion regarding the desirability and justification for such a commission and at the moment it seemed advisable for our organization to take no active part in the deliberations."[39] Warren and others believed the disease was "more or less limited" in its distribution and therefore did not merit international attention. It was difficult for those wanting to tackle bilharzia—such as medical staff in Egypt and Sudan—to persuade potential donors, such as the RF, to consider substantial investment.

Nevertheless, the LNHO held a meeting on 1 and 2 December 1938, albeit with only four attendees: Professor R.T. Leiper (London School of Hygiene), Dr. O.F.H. Atkey (Sudan Medical Services), Dr. E. Burnet (Pasteur Institute, Tunis), and Dr. Sergent (Pasteur Institute, Algiers). One way in which the members of this meeting hoped to promote the important of addressing bilharzia was by linking it with rural hygiene, the subject of the next section:

> All those factors which come within the scope of rural hygiene have a bearing upon it, that is to say the relation of man to the soil, agriculture, irrigation, housing, water supply, nutrition and sewage disposal. The study of Bilharziasis is therefore bound to contribute to the elucidation and solution of the wider problem of rural hygiene.[40]

While not directly working in Sudan or Uganda, the development of international research into malaria and other diseases gave researchers and administrators a platform to promote the importance of addressing these issues on the African continent.

II: Rural Hygiene and Beyond

My doctoral research showed that there was a shift between 1925 and 1935 from focusing solely on epidemic disease control, as greater attention was given to the social aspects of disease. Interest in social medicine, certainly in Europe, encouraged researchers to address broader socio-economic concerns, such as nutrition, rural hygiene, child welfare, and venereal disease. The development of

water supplies fell under the broad remit of rural hygiene. This section therefore looks briefly at the development of rural hygiene, initially through the European Conference that took place in 1931, as a programme that sought to address the socio-economic factors that impacted health.

While the influence of the Great War had brought the concerns of rural populations to the fore, concerted international efforts to better the position of rural communities were only first made in the late 1920s and early 1930s. The European Conference on Rural Hygiene in 1931 reflected the LNHO's move to action social medicine agendas as well as the growing influence of American practice in Europe. The RF had a longstanding interest in hygiene and sanitation, for example, and played an important role in supporting European health organisations such as the renamed London School of Hygiene and Tropical Medicine (known previously as the London School of Tropical Medicine, until RF support enabled an extension of its work). For example, Arthur Sweetser, a journalist and statesman, noted in a memorandum concerning the Rural Hygiene Conference that "American influences as regards sanitary engineering is particularly strong" and remarked that the sanitary engineering profession was "almost unknown" in Europe in 1930.[41]

While there was some cross-over in social medicine and rural hygiene agendas, a letter to RF's F.F. Russell further highlighted the different emphases across the Atlantic:

> I may say that it stuck me that [Europeans] they make more of work in what they call social medicine. They define social medicine in vague terms, but it includes health work not only in tuberculosis, venereal diseases, maternal and child welfare, but also in such things as eugenics and alcoholism on which some of them at least laid great stress.[42]

Part of the challenge in understanding the role of water supplies in relation to rural hygiene and social medicine is due to such vaguery in their definitions and applications across different settings. A cursory comparison of discussions on rural hygiene in Europe, Africa, and Asia highlights the different emphases evident at regional conferences in 1931, 1935, and 1937, respectively. While each

of these conferences sought to address socioeconomic issues in rural communities, the Bandoeng Conference made concerted efforts to bring together people from a variety of backgrounds, from doctors, educators, and agronomists to sanitary engineers, nutrition experts, and state administrators.[43] This was in contrast to the European and African Conferences, where the vast majority of attendees had a background in medicine or public health.

The three primary items on the agenda for the European Conference on Rural Hygiene in 1931 were how best to ensure effective: (1) medical assistance (2) health service organisation, and (3) sanitation in rural communities. [44] The dialogue on rural hygiene at the Pan African Health Conference in 1935 highlighted the need for economic development through better nutrition and housing, as well as the need for better coordination of services but discussions were centred on the importance of integrated preventive and curative services and the utilisation and training of local people. At the European and Bandoeng Conferences, the importance of water supplies and sewage disposal were addressed for rural communities; similar discussions were not so extensive at the Pan African Health Conference in 1935.[45] Some advocates of rural hygiene, such as William Kauntze (director of the Uganda Medical Department), found it difficult to persuade colleagues in East Africa to prioritise this area over others in the 1930s; they instead preferred to focus efforts on nutrition. In part, this can explain the differing discussions that took place at the Pan African Conference in 1935, as compared with the specific conferences on rural hygiene in Europe and Asia.

Such was Dr. Kauntze's interest in exploring rural hygiene for Uganda that he contacted George Strode in 1937 to discuss plans to visit various European countries to study their health activities. The Rockefeller Foundation, through Elizabeth Crowell (an American nurse, social worker, and RF staff member) was kind enough to provide letters of introduction to aid Kauntze's travels.[46] Kauntze's two areas of particular interest were in the training of local personnel and in the role of sanitary engineering. George Strode noted in his diary entry on 12 September 1937 that, as a result of his European travels, Kauntze wanted to train African doctors "to develop a preventive outlook" and was keen to procure the

services of a sanitary engineer for Uganda.[47] Kauntze's desire to pursue this subject highlighted the role of colonial administrators, particularly the directors of medical services, to shape the direction of health work within the territories under their charge.

Yet for Dr. Atkey, director of the Sudan Medical Services, attempts to secure visits by RF personnel to Sudan during the 1920s and early 1930s regarding bilharzia were not met with the same level of enthusiasm.[48] As discussions about bilharzia earlier suggested, this was not regarded as a disease of international importance in the 1920s and 1930s. When Kauntze pursued rural hygiene research, on the other hand, it had international recognition; perhaps, this is why those advocating for international studies on bilharzia sought to connect their research with the rural hygiene agenda. Therefore, while individuals were important in shaping health agendas, clearly, topics deemed of greater international importance (by a larger group of experts) were given priority, which is not surprising given the remit of the RF's IHD and the LNHO.

Conclusion

This report has highlighted the challenges faced in understanding whether water was conceptualised as a key public health issue c.1920-1940. The two main challenges were, first, that the diseases researched and combatted, with Rockefeller Foundation support in Uganda and Sudan, did not have consistent connections to water (sleeping sickness and yellow fever); second, the diseases that displayed a more consistent connection to water, such as malaria and bilharzia, were either minimally addressed or not addressed by international agencies in Uganda and Sudan. *Defining Diseases* highlighted the variety of conceptualisations of sleeping sickness, yellow fever, and malaria in the first half of the twentieth century. The RF was keen to support programmes of international importance, but what fell within this category was often subjective and dependent on the experiences of those researchers and administrators with greatest influence. *Rural Hygiene and Beyond* provided a cursory examination of the differing conceptualisations and applications of rural hygiene. It showed that

the development of water supplies and sanitation was given greater attention in Europe and Asia in the 1930s than in Africa but that there were individuals working on the African continent, such as Kauntze, who were interested in the role of water supplies and sanitation for improving health.

An Avenue for Further Research - Water and Development: Post-War Agendas and Onwards

After the Second World War and following the inauguration of the WHO, the Rockefeller Foundation prioritised food and education over health. Likewise, when the Ford Foundation reviewed their largest sectoral engagements in 1976 as "agriculture, population, education and social science research", Francis Sutton also commented that "health is notably absent from the list, since the Ford Foundation does not have programs in this field, except as they arise out of population interests or as nutritional interests that grow out of our concerns for agriculture and education."[49] An initial foray into the role of water in RF and Ford Foundation programmes after the Second World War, showed there were some connections to water in the development discourses; these can be observed in discussions and programmes that sought to address food and education deficiencies worldwide. As the relationship between health and development (particularly agricultural) once again came to the fore, it was increasingly evident that water was often threaded through this discourse. As such, this an avenue worthy of further research.

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[2] Randall Packard, "The History of the Social Determinants of Health in Africa," in *History of the Social Determinants of Health: Global Histories, Contemporary Debates*, ed. Harold J. Cook, Sanjoy Bhattacharya and Anne Hardy (Hyderabad: Orient Blackswan, 2009): 42- 77, 47. Packard refers to these as the "social determinants of health."

[3] Gilbert F. White, David J. Bradley and Anne U. White, *Drawers of Water: Domestic Water Use in East Africa* (Chicago and London: The University of Chicago Press, 1972), chap. 6, especially 162-176.

[4] Exceptions include work on hookworm and bilharzia in Egypt and yellow fever work in West Africa (and later in East Africa).

[5] The RAC holds various papers relating to this institute, particularly regarding its work on yellow fever in the 1930s and 1940s.

[6] Lunt Greenfield, (2018) *Water Marginalised*, http://etheses.whiterose.ac.uk/26922/, 126-129; Lunt, "The League of Nations Health Organization: Water, Health and Development in Colonial Africa, 1925-44,": 167-184; Rockefeller Archive Center (RAC), Rockefeller Foundation Archives (RF), RG 1.1, Series 100, Box 20, The League of Nations Health Section 1920-1928, *Memorandum on the Functions of the Health Organisation of the League of Nations, 1921*.

[7] RAC, RF RG 1.1, Series 100, Box 20, Folders 165-172 (Folder 170), The League of Nations Health Section 1920-1928, Letter to Professor Selskar Gunn from Ludwik Rajchman, 24 August 1926.

[8] See Uganda, *General Annual Medical Report (GAMR)*, for the years 1925 to 1945, Wellcome Library, London, WA28.HU4 U26: Uganda, *GAMR*, 1926, 64-71; Uganda, *GAMR*, 1927, 66-74; Uganda, *GAMR*, 1928, 75-83; Uganda, *GAMR*, 1929, 53-59; Uganda, *GAMR*, 1930, 88-93; Uganda, *GAMR*, 1931, 77-80.

[9] RAC, Nelson D. Davis Papers (FA048), RG IV2A28, Box 28, League of Nations Health Organisation, *Final Report of the League of Nations International Commissions on Human Trypanosomiasis*, Geneva, 1928.

[10] RAC, Nelson D. Davis Papers (FA048), RG IV2A28, Box 28, *Final Report of the League of Nations International Commissions on Human Trypanosomiasis*, 329-390. There were a few mentions relating to Lake Victoria earlier in the report. See 103, 222, and photographs 12-19 and 21-22 between pages 244 and 246.

[11] RAC, Nelson D. Davis Papers (FA048), RG IV2A28, Box 28, *Final Report of the League of Nations International Commissions on Human Trypanosomiasis*, 356 (map on following page).

[12] Cambridge University Library, Royal Commonwealth Society Collection, OP.109.0.103, C.3.M.3.1929.III, L. Raynaud, League of Nations Health Committee, Minutes of the thirteenth session 25-31 October 1928, Fourth Meeting; RAC, RF, RG 1.1 Series 100, Box 21, Folders 173-180 (Folder 176), League of Nations Health Section 1928-1937, Letter to Dr. Russell from Ludwik Rajchman, 17 June 1932.

[13] *Ibid.*

[14] Cambridge University Library, Royal Commonwealth Society Collection, OP. 309.25.01(2), "Report of the International Conference of Representatives of the Health Services of Certain African Territories and British India, Cape Town, 15-25 November 1932," 44.

[15] RAC, RF, RG 1.1, Series 2770, Box 1, Folders 1 to 12 (Folder 1), Entebbe Research Institute Yellow Fever, Uganda, 1934-47, RF Motion, Africa–Yellow Fever Studies—Continuation and Expansion of Program, 11 April 1936.

[16] The National Archives, England (TNA), CO 323/936/1, William Ormsby-Gore, Minute, 25 February 1925.

[17] TNA, CO 847/6/7, T. Stanton (Medical Adviser to the Colonial Office), Minute, 15 April 1936.

[18] RAC, RF, RG 1.1, Series 4770, Box 1, Folders 1 to 12 (Folder 2), Entebbe Research Institute Yellow Fever, Uganda, 1934-47, *A Yellow Fever Barrier*, Excerpt from Trustee Monthly Bulletin, May 1938; RAC, RF, RG 1.1, Series 4770, Box 1, Folders 1 to 12 (Folder 1), Entebbe Research Institute Yellow Fever, Uganda, 1934-47, Letter to Dr. Sawyer from Fred Soper, 26 December 1935: "a new laboratory building built for the Trypanosomiasis Commission which for some reason went phut (you see I have gone British) is available and is ample for all needs including two and possibly three residences for staff members."

[19] RAC, RF, RG 1.1, Series 4770, Box 1, Folders 1 to 12 (Folder 1), Entebbe Research Institute Yellow Fever, Uganda, 1934-47, Letter from George K. Strode to Dr. Sawyer, 3 March 1936.

[20] *Ibid.*

[21] RAC, RF, RG 1.1, Series 2770, Box 1, Folders 1 to 12 (Folder 1), Entebbe Research Institute Yellow Fever, Uganda, 1934-47, RF Motion, Africa–Yellow Fever Studies—Continuation and Expansion of Program, 11 April 1936.

[22] RAC, RF, RG 5.3, Series 4770, Box 211, Folders 2601 to 2613 (Folder 2608), *Summary Report on Yellow Fever Investigations 1939-1946*.

[23] RAC, RF, RG 5.3, Series 4770, Box 211, Folders 2601 to 2613 (Folder 2608), *Summary Report on Yellow Fever Investigations 1939-1946*.

[24] *Ibid.*

[25] *Ibid.*

[26] RAC, RF, RG 1.1, Box 21, Folders 173 to 180 (Folder 173), League of Nations Health Section, 1928-1937, Author Unknown, *Comments on the Conference held by the Malaria Commission of the League of Nations at Geneva 25-29 June 1928*: "the line was always pretty sharply drawn between the Americans (Plus Missiroli, plus the Malayans: Evans and Stanton) and the Europeans. There was (as Pittaluga said) very little converting done by either side, though a great many ideas were exchanged and clarified"; RAC, RF, RG 1, Series 100:I, Box 47, Folder 457, Diary entry (unknown), *Dr. Klotz, WAS, JAF [John A Ferrell], HHH, CHL, CWS, luncheon*, 8 December 1927; RAC, RF, RG 1, Series 100:I, Box 47, Folder 457, Memorandum from Persis Putnam to Dr. Russell, 26 Sept 1927.

[27] RAC, RF, RG 1.1, Box 21, Folders 173 to 180 (Folder 173), League of Nations Health Section, Author Unknown, *Comments on the Conference held by the Malaria Commission of the League of Nations at Geneva 25-29 June 1928*

[28] *Ibid.*

[29] *Ibid.*

[30] RAC, RF, RG 1.1, Box 21, Folders 173 to 180 (Folder 173), League of Nations Health Section, *Resume of the Conference held by the Malaria Commission of the League of Nations at Geneva 25-29 June 1928*.

[31] *Ibid.*

[32] RAC, RF, RG 1.1, Box 21, Folders 173 to 180 (Folder 178), League of Nations Health Section, Letter from L.W. Hackett to Dr. F.F. Russell, 11 September 1934.

[33] *Ibid.*

[34] Haslam was director of Library Services, London School of Hygiene and Tropical Medicine & assistant director, Bureau of Hygiene and Tropical Diseases. See RAC, Nelson C. Davis Papers, Series 3, Subseries 3, Box 22, Folder 160, J.F.C. Haslam, *Schistosomiasis and Malaria in relation to Irrigation*, London, May 1928, particularly 25-28; quote on 25.

[35] Malcolm Watson, "Malaria and Nutrition in Africa," *Journal of the Royal African Society*
36 (October 1937): 405-420, 407-408

[36] RAC, RG 1.1, Series 485 North Africa, Box 1, Folder 6 (Egypt & Hookworm), 1930-1932, Letter from Claude Barlow to Victor Heiser, 22 August 1931.

[37] Haslam, *Schistosomiasis and Malaria in relation to Irrigation*, 1929, 26: "the whole problem (so far as transmission and spread is concerned) centres round the fact that the provision of additional water for agricultural purposes may mean the provision of additional places for the breeding and multiplication of anopheles mosquitoes."

[38] RAC, RF, RG 6.1 Series 1, Box 38, Folder 470, League of Nations Health Section, Schistosomiasis Survey, 1938-39, Letter from C. Barlow to Dr. A.J. Warren, 7 November 1938.

[39] RAC, RF, RG 6.1 Series 1, Box 38, Folder 470, League of Nations Health Section, Schistosomiasis Survey, 1938-39, Memorandum no. 15 from A.J. Warren to Dr. C. Barlow, 8 November 1938.

[40] RAC, RF, RG 6.1 Series 1, Box 38, Folder 470, League of Nations Health Section, Schistosomiasis Survey, 1938-39, *Consultation of Experts on Bilharziasis (Schistosomiasis), Geneva, Dec 1 and 2 1938*, 14 December 1938.

[41] RAC, RF, RG 1.1, Box 21, Folders 173 to 180 (Folder 176), League of Nations Health Section, 1928-1937, Memorandum from Arthur Sweetser to Raymond Fosdick on *The European Conference on Rural Hygiene*, 24 Feb 1931, 5.

[42] RAC, RF, RG 1.1, Box 21, Folders 173 to 180 (Folder 175), League of Nations Health Section, 1928-1937, Letter from (?) Howell to F.F. Russell, 27 June 1930.

[43] RAC, RF, RG 1.1, Box 21, Folders 173 to 180 (Folder 180), League of Nations Health Section, 1928-1937, *Report on the League of Nations Rural Hygiene Conference*, Bandoeng, August 1937.

[44] RAC, RF, RG 1.1, Box 21, Folders 173 to 180 (Folder 176), League of Nations Health Section, 1928-1937, Memorandum from Arthur Sweetser to Raymond Fosdick on *The European Conference on Rural Hygiene*, 24 Feb 1931, 1.

[45] League of Nations, Health Organisation, European Conference on Rural Hygiene, Report of the Prepatory Committee on the Principles governing the Organisation of Medical Assistance, the Public Health Services and Sanitation in Rural Districts, (Geneva, June 1, 1931): 36-39 on sewage disposal; 39-43 on water supplies; RAC, RF, RG 1.1, Box 21, Folders 173 to 180 (Folder 180), League of Nations Health Section, 1928-1937, *Report on the League of Nations Rural Hygiene Conference*, Bandoeng, August 1937.

[46] RAC, RF, RG 6.1, Series 1.1, Box 7, Folder 172, W. H. Kauntze 1937-1939. See Kauntze correspondence with the RF.

[47] RAC, RF, RG 6.1, Series 1.1, Box 7, Folder 172, W.H. Kauntze 1937-1939, George Strode, Diary entry for 12 September 1937.

[48] RAC, RG 1.1 Series 485, North Africa, Box 1, Folder 5 (Egypt and Hookworm) 1928-1929, Hookworm, letter from Claude Barlow to Victor Heiser, 1 March 1931.

[49] RAC, Ford Foundation, Series 5, Box 57, Folder 28, F.X. Sutton, *The Foundations and the Governments of Developing Countries,* 1976, 19.