

**Claude Barlow and the
International Health Division's
Campaign to Eradicate Bilharzia
(Schistosomiasis) in Egypt,
1929-1940**

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Abstract

Disease eradication has often been likened to a siren song; the task has an immediate allure and a deceptive ease, yet many efforts to master eradication have floundered. The International Health Commission first encountered bilharzia (schistosomiasis) while conducting some of the first hookworm campaigns outside of the American South. While surveying the burden of hookworm in Egypt, staff stumbled across the true scale of schistosome fluke infection across the country. The Rockefeller Foundation's International Health Division returned to Egypt in 1929 and commenced an eleven-year eradication campaign overseen by parasitologists Claude Barlow and J. Allen Scott. What began as a seemingly simple mission to evaluate the success of sanitation interventions in rural villages soon became a complex and fraught program pitting both men against each other, local opinion, and the orthodoxies of international public health experts. In this research report, reflecting on one part of my wider research on the history of eradication thinking in public health, I focus on the important work of Barlow and overview significant aspects of his collected written communication held in the Rockefeller Archive Center. Beginning as an optimistic advocate of eradication, Barlow's experiences in Egypt transformed his views on the likelihood of elimination and – in important ways – foreshadows the ethical, socio-political, and technical limits currently emerging around contemporary philanthropic drives to eradicate infectious diseases.

Introduction

Bilharzia, or schistosomiasis, is currently estimated to impact as many as 200 million people in 74 countries globally, and is particularly burdensome in the Nile Valley and parts of Western Africa, with schistosome species also endemic in China and South America.¹ The disease is caused by the laying of eggs in human blood vessels by one of five species of parasitic Trematoda flatworms (or flukes) of the genus *Schistosoma*. The parasites are transmitted by freshwater snails and are commonly transferred to children and adults who come into regular contact with freshwater that is contaminated by the parasites released from their snail hosts. Once in the water, the parasites bore directly into human skin and release their eggs. These eggs are then trapped in the human liver, gastrointestinal tract, or genitourinary system, where they generate an immunological response. The severity of this response depends upon the number of worms and eggs trapped in the body, but symptoms of chronic bilharzia include blood discharge in urine, lesions occurring in the intestines and liver, and the debilitating enlargement of the liver and spleen. The distribution, epidemiology, and pathology of bilharzia mean that it has long been considered a neglected disease, albeit one with significant impact on human health and economic productivity in predominantly rural and marginal areas.

The Rockefeller interest in bilharzia emerges from, what seems at first, a surprising direction - the Rockefeller Sanitary Commission for the Eradication of Hookworm Disease, founded in 1909 with a grant of \$1 million from John D. Rockefeller, Sr. Wickliffe Rose, Administrative Secretary to the Commission, pioneered survey, treatment, and prevention methods against hookworm in the American South. Rose's approach to hookworm eradication prioritised demonstration of modern medicine and sanitation as a means of convincing reluctant rural Southerners to take preventative doses of anthelmintic thymol and to invest in cheap and sanitary outhouses.² At the beginning of this campaign, Frederick Gates, philanthropic advisor to the Rockefeller family, had suggested that Rose expand the horizons of the mission to map the incidence of the disease around the world. Here, we see the beginnings of what was to become a global ambition to treat, prevent, and eradicate diseases – and other concerns – seen to

have unwelcome impacts on human life, economic productivity, and societal uplift.³ Following the incorporation of the Rockefeller Foundation (RF) in 1913, Gates and Rose returned to the international dimensions of public health and made the case for expanding hookworm eradication work into other areas of the world.⁴ In 1914, with the support of the Board of the Rockefeller Foundation, the Sanitary Commission was dissolved, and its replacement, the International Health Commission, was tasked with extending the work on hookworm to new areas of the world.

Rose travelled the world seeking support among the colonial powers for prioritisation and investment in anti-hookworm work, particularly in tropical areas believed to be akin to the American South in climate, disease burden, and economic stagnation. Lessons learned in the South, it was assumed, could be translated simply and effectively to new regions. First arriving in Egypt in 1914, after initial visits to London, Rose soon convinced the Egyptian Public Health Department to initiate a thymol-oriented campaign against the hookworms that had plagued the region for millennia. The campaign made slow progress and encountered forms of evasion and resistance similar to those met by the original Sanitary Commission in the American South.⁵ Rose hoped that the work against hookworm could be continued and expanded, but the Rockefeller public health connections to Egypt quickly came to an end, as the country was formally declared a British Protectorate and public health efforts were diverted to meet needs linked to the First World War. One of the lasting impacts of the 1914 hookworm campaign, however, was in revealing the burden of another disease in the country: *bilharzia*. Writing to Rose, a doctor at the American Mission Hospital in Egypt concluded that “probably 30% of the inhabitants [of the country] have bilharzia,” with Rose concluding that it was “one of the greatest scourges here.”⁶

Egypt was to become a key site in the battle against bilharzia, with inter-war British and Egyptian researchers going on to develop the use of: a) irrigation by intravenous tartar emetic to kill parasites in the human bloodstream; and, b) the application of copper sulphate to bodies of water in order to kill snails. An entire experimental complex was developed across the country in the years immediately following the First World War, with bilharzia treatment annexes attached to most hospitals in the country.⁷ Treatment completion rates were low due to the painful

ordeal of injecting intravenous tartar emetic into the bloodstream and because of the economic impact of lost employment arising from the lengthy irrigation procedure. Outcomes from the research dimension of the campaign initially seemed far more positive. Mohammed Khalil, a graduate of the London School of Hygiene and Tropical Medicine, began the first field trials of copper sulphate at the Dakhla Oasis in the Western Desert during 1926 and claimed that the introduction of the drug to spring-fed streams had led to a significant reduction in the incidence of both snails and bilharzia.⁸ Against this backdrop of uneven success in the campaign, the Egyptian authorities requested further external support to conduct research into the life-course of the snails. There was also an acute need for technical expertise in extending the supply of safe drinking water and sanitary sewage systems.⁹ It was this latter request that led to the return of the Rockefeller Foundation to Egypt after a period of 13 years, as the RF sought to apply lessons concerning the importance of sanitation learned from the hookworm eradication campaigns to new diseases and locations. Bilharzia has certain differences to hookworm – hookworm, for example, having no intermediate host - but was eventually considered an ideal candidate for demonstrating the viability and impact of eradication as a public health strategy. Egypt was positioned as a useful laboratory for the global application of eradication techniques honed on hookworm in the American South, just as the country had – and would go on to be – a laboratory for colonial and neoliberal forms of governance.¹⁰

From Baltimore to Cairo

It is telling that the first Rockefeller references to bilharzia work in Egypt frame the disease as a problem of sanitation. Victor Heiser, Associate Director of the International Health Division (IHD), argued that “the fundamental problem ... for the control of bilharzia is the prevention of soil pollution.”¹¹ These words from Heiser are indicative of the cross fertilisation of ideas and strategies from the ongoing work on hookworm eradication into other campaigns. The International Health Division allocated a 1927 grant toward the sanitary reform of Egyptian

villages and, following the earlier invitation from the Egyptian Government, opted to deploy American personnel to the country (unwittingly giving rise to tensions between foreign and domestic scientists that would simmer for decades). The ideal sanitary team, according to Heiser, would embody “the willingness to bring about the complete installation of the right kind of latrines in a suitable village of several thousand population.”¹² To support and strengthen the on-going Egyptian bilharzia campaign, the IHD hired two promising parasitologists, J. Allen Scott and Claude Barlow. Both men were former graduates of Johns Hopkins School of Hygiene and Public Health in Baltimore and they had each received a D.Sc degree in Hygiene (Scott having worked on hookworm and Barlow having researched the *Fasciolopsis buski* parasite). Arriving in Cairo in 1929, their stated mission was to discern “what, if any, influence the sanitation campaign had upon the transmission of the two diseases ankylostomiasis and bilharzia.”¹³ Sanitation was to be an entry point for the IHD’s attempts to strengthen Egyptian public health, but also became a locus for efforts seeking to reform peasant and village life.

Barlow was, in many respects, a foundation man, with his early research and subsequent professional career supported by the Rockefeller Foundation. Before coming into contact with the RF, he had already completed 21 years with the American Baptist Foreign Mission Society in China, after graduating with a degree in medicine from Northwestern University. His personal correspondence from this time is full of illuminating reflections and light-hearted illustrations of Chinese public health, uneven development, and theology.¹⁴ He first received a Rockefeller grant in 1921 to conduct *F. buski* research in China, and was later encouraged to return to America to submit what became a celebrated thesis at Johns Hopkins in 1925.¹⁵ Adoration for the published thesis extended far beyond the university with one newspaper reviewer concluding that “[i]t is a story of patient and unremitting toil, of perseverance in the face of repeated discouragement, of seemingly insuperable obstacles overcome, of personal heroism unsurpassed on any battlefield since the first Egyptian pharaoh led an army against the Hittite chiefs.”¹⁶ Here we see the public health researcher as a celebrated hero in the war against parasites and the saint-like conqueror of both underdevelopment and ignorance. Public health research was clearly a higher calling for Barlow, and the call from the International Health Division to support the eradication of bilharzia represented an opportunity to continue his personal

and ordained mission of serving the poor and the sick. “It seems to me a real call to service which is too personal for me to disregard,” he wrote to his supporters in the American Baptist Foreign Mission Society. Then, capturing both the practical and emotional scope of eradication, he went on to write that the work in Egypt “is a project which involves thousands of lives and the efficiency of hundreds of thousands of people and therein lies its strong appeal to me ... as one of their contributions to the Cause of Christian Missions.”¹⁷

Upon their arrival in Egypt, Barlow and Scott soon encountered difficulties as the implementation of the sanitation scheme floundered. The men were tasked with comparing the incidence of hookworm and bilharzia in two selected villages north of Cairo, Bahtim and Mostorud.¹⁸ Bahtim had been given a sanitary latrine funded by the International Health Division grant, while Mostorud received no latrine and was left as a ‘control’ case in an early example of an experimental approach to tackling public health problems. Local residents reacted angrily to their enrolment in this external research project and the residents of Mostorud, in particular, felt that they were being denied interventions that others were benefitting from. In his 1930 *Annual Report*, Barlow documents how villagers subverted the collection of individual stool samples from cans that were meant to be searched for excreted eggs. Barlow identified cases where stools had been ‘pooled’ from an entire household into one can, deliberately contaminated with buffalo or camel excrement, and even simply returned to collectors empty.¹⁹ In the report of the following year, Barlow wrote that there had been “no appreciable effect, due to sanitation” other than that “Bahtim is a cleaner-smelling, more wholesome village with its latrines than it used to be without them.”²⁰ The sense of frustration in these reflections continues into later years as the search for evidence progress against the parasites increasingly segues into a hubristic account of latrine building progress along the Nile Valley. Despite the setbacks, Barlow concluded that “I am convinced that our statistics will eventually show a significant improvement in worm diseases.”²¹

The egg counting data that Scott had been busy collating suggested no such grounds for optimism and, increasingly disillusioned with the narrow focus on latrines, he returned to Johns Hopkins in 1936 to author a quite damning overview of arrogance and experimental over-reach in the Egyptian sanitation

campaign. Writing to the Scientific Directors of the International Health Division, Scott concluded that “[t]he crux of the matter is that this sanitation was installed in the houses, while the most important parasites were transmitted in the fields.”²² A basic disconnect between the sites of infection and intervention had undermined the entire campaign.

New Directions, Familiar Problems

Barlow’s correspondence indicates that he had never been entirely convinced by the focus on sanitation. “I feel that snail study, looking to control, is the one supremely crucial factor in prophylaxis,” he wrote to his superiors in New York.²³ Prevention, put simply, would undoubtedly be more impactful than mere sanitation and would help – in his words – “unfix a doubtful species.”²⁴ Eradication campaigns elsewhere in the world offered hope to the snail researchers in Egypt, as demonstrated in the successful use of Paris Green larvicide spraying against malarial mosquitoes in Italy.²⁵ Barlow’s correspondence clearly suggests that even while conducting the sanitation work, he felt a concerted attack on the snails themselves would likely reap the greatest reward. Khalil’s treatment of water with copper sulphate at the Dakhla Oasis, and the documented drastic declines in snail populations, proved a most promising avenue of research, and raised the hope that treatment across the entire Nile basin might eradicate snails from the interconnected canal and river ecosystems for good.²⁶ Here we see consideration of an attempt to intervene and engineer a socio-technical solution on a previously unheard of scale.

Barlow’s zeal for killing snails eventually abated as the chemical and technical arsenal at his disposal was blunted. He accused Khalil of fraudulently generating results for his much-publicised research with copper sulphate, and these accusations levelled against a leading national scientist by a foreigner caused a significant uproar in the Egyptian research community. Khalil, according to observations made by Barlow on a field visit, had diverted a stream in the Oasis and manipulated the streambed to remove snail habitats.²⁷ Copper sulphate, in other words, was not a proven snail-killer but a much-hyped intervention that

captured the hopes and desires of the Egyptian scientific community. Various experiments with seasonal draining of canals and the drying of muddy banksides also failed as snail species proved capable of surviving months away from water.²⁸ Rubber boots to protect the feet of snail collectors and clearers were in scarce supply.²⁹ The payment of local men to hand clear weeds and snails from the water proved simpler and more effective by disrupting snail breeding sites. “The results obtained,” an increasingly exasperated Barlow wrote, “were decisively positive and point encouragingly to the use of clearance as the most important measure in a scheme for the control of schistosomiasis in Egypt.”³⁰

In New York, George Strode – the then Director of the International Health Division – agreed with Barlow that sanitation was not working, and encouraged the focus of the work in Egypt to pivot to experimental snail clearance from 1937.³¹ Now without Scott, Barlow employed an expanded team of local men to clear certain river and canal sites while leaving others as ‘control’ zones. The results of this work, reported in 1939, indicate a substantial decline in snail numbers in the clearance zones (from 3,895 counted in December 1937 to 45 in December 1938) against an overall increase in the control areas.³² This was the hard, quantitative evidence of progress that the Division had craved since 1929. It was, however, also the evidence needed to close down the IHD's involvement with bilharzia in Egypt. “On the basis of these experiments,” the Division’s directors wrote, “it is estimated that schistosomiasis could be entirely eliminated from Egypt by canal clearance over a period of twenty-five years.” It was now time, in other words, for the IHD to hand over the campaign to Egypt by helping to “create an organization within the government to continue the work after the withdrawal of the Division’s aid.”³³ In the spirit of Rockefeller philanthropy, the IHD’s grant money was intended to evidence the catalytic potential of targeted interventions rather than create longer-term dependency. The twenty-five year target, like many attempts to set eradication timeframes since, also positioned success as both near-at-hand and yet also sufficiently distant; Rockefeller Foundation involvement could be presented as a success, while also absolving the RF from the more difficult task of completing the job. Once clearance had been proven effective, the IHD moved on; it withdrew from Egypt in 1940.

The Continued Pursuit of Progress

Barlow became the Director of the Egyptian Government's Bilharzia Snail Eradication Section and he went on to lock horns again with Khalil, who had led the rival Endemic Disease Section since 1928.³⁴ The clash between Barlow and Khalil doomed the fight against snails in the late 1940s. Khalil, angered by the recruitment of a foreign national to lead a Section, successfully lobbied for a ministerial committee to be launched to investigate Barlow's intentions. Barlow suggested that this move "had such a political scent that it developed into a positive stench."³⁵ The committee opted to create one unified and permanent Bilharzia Snail Eradication Section, headed by Barlow. "I'm still in the fight against schistosomiasis but they can count me out entirely if I have to fight politics as well as snails," Barlow wrote to his wife.³⁶ The creeping politicisation of eradication seemingly angered Barlow, but the campaign had *always* been political; it is hard, for instance, to see external assistance intended to improve Egyptian health and productivity as anything other than targeted interventions in the political economy of a geopolitically significant region.

The conflict with Khalil continued as the Egyptian made several ultimately unsuccessful efforts to unseat and replace Barlow as the head of the permanent Section. Khalil's memoranda to Barlow are frequently accompanied by Barlow's handwritten notes debunking the Egyptian's arguments, accusing him of misattributing quotes from senior politicians, and listing his obstructions to the work of the Section.³⁷ In an undated memorandum written at the time, Barlow narrated why he had stayed in Egypt despite the setbacks and the opposition:

"There is only one reason. I am not my own master. I am under a dictatorship. Not the dictatorship of the Director of the Section [Khalil], nor the Government. I am under the dictatorship of the bilharzial snail and so are we all, whether we like it or not, and I do not wish to leave until I have accomplished what I set out to do: BREAK THAT TYRANNY."³⁸

Barlow's leadership of the Section ended in 1943, although he would remain a special advisor to his (Egyptian) successor. Eradication of the snails would not

take place and the policy of clearance eventually become unpopular as the use of chemicals (copper sulphate) once again returned to the fore. In the late 1940s, the International Health Division would again turn its attention to bilharzia in Egypt as part of the Sindbis village study aiming to understand the impact of the new social medicine on the health and productivity of so-called underdeveloped areas.³⁹ Socioeconomic conditions, this study claimed, lay at the root of most health problems. In prioritising snail elimination over efforts to distance social and economic activity from proximity to contaminated water, Barlow had – once again – concentrated his efforts in the wrong place.

Looking back at Barlow’s work in Egypt, it is easy to see similarities between the eradication project and other, contemporary initiatives intended to end infectious disease for good. Whether it is malaria, polio, or another candidate, the possibility of perfecting eradication attracts a certain zeal and hubris.⁴⁰ Promising technology, for example, often fails to meet expectations, especially when applied in unfamiliar contexts. Overt and covert resistance are common among populations sceptical of external intervention or even of the need to eradicate a disease that has been accommodated for centuries. The viruses or parasites themselves also play a cunning role, resisting human efforts to master, control, and eliminate them by lurking in the shadows or – as Barlow and his men found out – in the muddy reed beds. Any attempt to understand contemporary campaigns must be cognisant of past attempts to eradicate disease. It is in returning to the work and writings of researchers like Barlow that we see, painted so vividly, historical antecedents of the many promises *and* pitfalls of contemporary global health interventions.

¹ WHO (2019) Schistosomiasis Fact Sheet. <https://www.who.int/news-room/fact-sheets/detail/schistosomiasis>, last accessed 18 October 2019.

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³ Fosdick, R. (1952) *The Story of the Rockefeller Foundation*. New York: Harper, p. 15. See also: Nally, D. and Taylor, S. (2015) “The politics of self-help: the Rockefeller Foundation, philanthropy and the ‘long’ Green Revolution,” *Political Geography* 49, 51-63.

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- ⁵ Rose to J. Ferrell, April 3, 1914. Rockefeller Foundation Archives, RG 5, Series 1.2, Box 15, Folder 213.
- ⁶ H. L. Finley to Rose, July 31, 1913; Rose to Ferrell, April 3, 1914. Rockefeller Foundation Archives, RG 5, Series 1.2, Box 15, Folder 213.
- ⁷ Khalil, M. (1924) *Ankylostomiasis and Bilharziasis in Egypt: Reports and Notes of the Public Health Laboratories, Cairo*. Cairo: Government Publications Office.
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- ¹² Ibid.
- ¹³ F. Russell to C. Barlow, May 16, 1929. Claude H. Barlow Papers, Series 1, Box 1, Folder 2.
- ¹⁴ Barlow to H. Barlow, July 10, 1922. Claude H. Barlow Papers, Series 1, Box 1, Folder 1.
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- ¹⁷ Barlow to J. Franklin, May 10 1929. Claude H. Barlow Papers, Series 1, Box 1, Folder 2.
- ¹⁸ Barlow to American Baptist Foreign Mission Society, November 29, 1930. Claude H. Barlow Papers, Series 1, Box 1, Folder 3.
- ¹⁹ Barlow, *Annual Report*, 1930. Claude H. Barlow Papers, Series 4, Box 6, Folder 82.
- ²⁰ Barlow, *Annual Report*, 1931. Claude H. Barlow Papers, Series 4, Box 6, Folder 82.
- ²¹ Ibid.
- ²² J. A. Scott, "Infestation rates of *S. haematobium*, *S. mansoni* hookworms, and *Ascaris* in Egyptian villages following sanitation." *Preliminary Report*, October 1935. Rockefeller Foundation Archives, RG 1.1, Series 485H, Box 1, Folder 5.
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