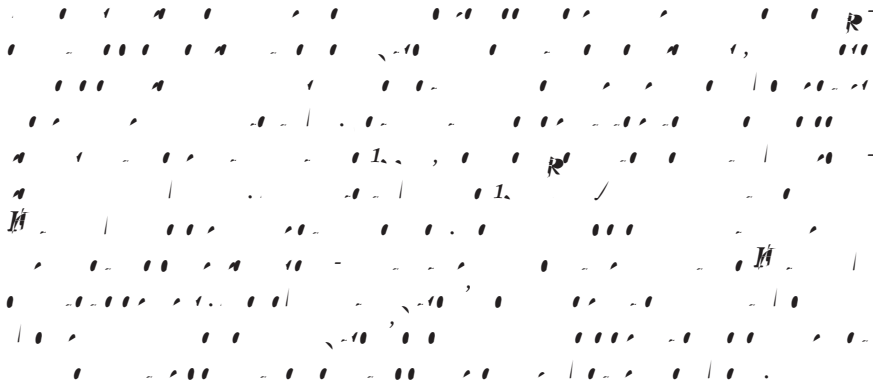


# The Dammed Body: Thinking Historically about Water Security & Public Health

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**O**n March 30, 1977, the legendary Egyptian singer and actor ‘Abd al-Halim Hafiz died at the age of forty-seven from complications of a chronic and severe parasitic infection. Few stars in Egypt have been as beloved as ‘Abd al-Halim. His musical career was tightly intertwined with the rule of Egyptian President Gamal Abdel Nasser (1954– 1970) and the politics of that period. Young, charismatic, and inspired, Nasser was fiercely anticolonial and populist. ‘Abd al-Halim helped give voice to these politics. While he sang of love and longing, a subset of his music championed the nation and the struggles of its ordinary citizens. When Egypt’s “nightingale” died, the crowds who thronged the streets of Cairo for his funeral were so distraught that they sang his name over and over again. [Egyassener92929292y](#)  
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Scott estimated that approximately 60 percent of Egypt's population was infected with the parasites that cause schistosomiasis.<sup>2</sup> Despite the fame and fortune that

tensifying environmental transformation. As the effects of climate change accumulate, some argue that dams might serve as a form of protection during years of drought and flood and a relatively “clean” way to produce energy.<sup>8</sup> This argument is reflective of a broader approach that believes solutions to climate change will come in the form of big technologies that reshape our environments and protect us from the spiraling effects of ongoing damage. Twentieth-century Egyptian history serves as a potent reminder that environmental interventions are also bodily, one manifestation of which is disease, as Julie Livingston’s contribution to this issue of *JES* describes from a number of different angles.<sup>9</sup> This history also demonstrates that disease never falls equally on a population as its distribution and its effects are inevitably structured by questions of race, class, and geography. This was as true of schistosomiasis in twentieth-century Egypt as it is with respect to the ongoing COVID-19 pandemic.<sup>10</sup>

Neither does the comparison of similar forms of technology across time and space reveal the complexities of their embeddedness and experience. While a shared body of environmental effects has often marked the construction of dams in Africa, a closer look demonstrates that technology is not determinative in its form but rather functions as a material manifestation of specific political economies and technologies of rule, a point highlighted by Allen Isaacman in this volume in his discussion of the decades of controversy that have surrounded the Cahora Bassa Dam.<sup>11</sup> Comparisons can obscure what is necessarily particular, unforeseen, and unfamiliar. In Egypt as elsewhere on the African continent, current threats to water security and the impact of proposed solutions are specific, contextual, and more complex than a simple function of environmental change. The histories of climate change will be those of social hierarchy, global capitalism and its local forms, and approaches to governance. As Egypt’s trajectory demonstrates, change will not (only) be experienced at the scale of the globe or even that of the nation but also through individual bodies that exist in different sets of relations with a physical world.

One history of ‘Abd al-Halim Hafiz’s early death might begin in the southern Egyptian town of Aswan. In 1898, it was there that construction began on the first modern dam built on the Nile River, Khazan Aswan. Thirty-seven meters tall, when it was complete, it formed a reservoir that could store 980,000,000 cubic meters of water and transformed Egypt’s agricultural landscape.<sup>12</sup> For millennia, Egyptian agriculture had depended on the annual Nile flood, which cultivators had channeled into large basins where it soaked and fertilized the soils in which crops were sown. Egypt’s major produce had consisted of crops like wheat, which farmers planted following the evacuation of floodwaters, tended during winter, and harvested in spring.<sup>13</sup> Other crops grew during summer and the season of the flood but as they had to be watered by hand or animal,

the surface area that they covered was more limited. Following the completion of Khazan Aswan, an irrigation frontier divided Egypt. Perennial irrigation and year-round agricultural production predominated in the Nile Delta and the northern portion of the Nile Valley while the southern regions of Egypt's Nile Valley continued to practice basin irrigation.<sup>14</sup> In those regions that were perennially irrigated, irrigation canals and drains replaced basins. These waterways helped to sever with the relationship of agriculture to the temporality of the flood. By 1912, 3.3 of Egypt's 5.3 million cultivable acres were perennially irrigated.<sup>15</sup> Plots of land that had once grown a single crop grew two and sometimes three each year; these crops included cotton, sugarcane, and maize, whose widespread cultivation was impossible with basin irrigation.

Khazan Aswan was built by the British during their occupation of Egypt (1882–1923). During this time, Egypt developed a colonial economy characterized by the dominance of cash crop agriculture, cotton in particular, the consolidation of agricultural land in the hands of the elite, and the continued impoverishment of the rural working classes. The roots of this economy can be traced to earlier in the nineteenth century and the policies introduced by the country's Ottoman rulers.<sup>16</sup> When the occupation began, the Ottoman-Egyptian government's deep debt was one pretense cited as a justification for British control of Egypt.<sup>17</sup> The spread of perennial irrigation not only promised to fill state coffers with the land tax revenues; a large proportion of Egypt's cotton production flowed to textile mills in the north of England, further fueling British enthusiasm for the dam.<sup>18</sup> Large landowners were also eager to increase the productivity of their estates, the cultivation of lucrative cash crops in particular.

While the completion of Khazan Aswan was a boon to Egypt's ruling classes and colonial officials alike, it was those who labored in agriculture who experienced its construction and environmental impacts most intimately.<sup>19</sup> During the late nineteenth and early twentieth centuries, the majority of Egypt's population lived in the countryside and farmed the land. Some cultivated their own small plots; many worked for wages or as sharecroppers on large cotton-producing estates owned by the Egyptian elite. The introduction of perennial irrigation and year-round production meant more work for the countryside. It also entailed new forms of environmental contact. Laborers from rural Egypt excavated the canals and drains that carried water to and from crops year-round and cleared canals each winter of the silt that threatened to clog them. No longer performed by the energy of the flood, irrigation became the work of cultivators who waded in canals to channel water into the pulleys and Archimedean screws that helped lift water to the fields.<sup>20</sup>

The water that filled irrigation canals and drains was teeming with life. In addition to human beings, the *Schistosoma* and *Ascaris* parasites that cause schistosomiasis thrived in the slow-moving freshwater. So did

the two species of tiny freshwater snails, *Biomphalaria* and *Lymnaea*, that serve as the parasites' intermediate hosts. The eggs of these parasites exit the human body in urine and feces, hatching in freshwater. When this water also contains their intermediate mollusk host, the parasites undergo a series of organismal transformations that enable them to penetrate unbroken skin and infect a human body. Rural populations who were vulnerable to infection as most villages lacked easy access to water and canals became sites at which to wash, fetch water, and play. Men were particularly vulnerable to repeat and severe infections with these parasites. From their teenage years, the work of irrigation saw them wading in the water that filled canals during the time of the year in which the parasites were most infective.<sup>21</sup> While *Biomphalaria* and *Lymnaea* are endemic in Egypt, rates of infection in regions practicing basin irrigation were quite low, hovering around 5 percent.<sup>22</sup> The introduction of perennial irrigation caused the prevalence of the disease to skyrocket, averaging 60 percent nationwide and climbing as high as 90 percent in some regions.<sup>23</sup>

Parasites thrived also in the soils of Egypt's new agricultural landscape. Before the construction of the dam and the spread of perennial irrigation, soil had dried and cracked in the dry season that followed the harvest of crops and preceded the arrival of the flood. Perennial irrigation meant the near continuous presence of water on the land, which increased its moisture content. These changed conditions proved conducive to the life cycle of *Ascaris* parasites, which cause one form of hookworm disease.<sup>24</sup> The eggs of these parasites exit the human body in feces and, on soil with the right moisture and nutrition, the parasites hatch and transform, descending a short distance into the soil to await a new human host. As most Egyptians who lived in the countryside went barefoot, they were infected with the organism through their feet. While hookworm is endemic in Egypt, the spread of perennial irrigation altered the regional distribution of the parasite as well as the prevalence of infection among the population.<sup>25</sup> In the early twentieth century, the visible marks of hookworm infection were the most common cause disqualifying recruits for the Egyptian army.<sup>26</sup> By the middle of the 1930s, Scott estimated that five million of Egypt's twelve million inhabitants suffered from the disease.<sup>27</sup>

The spread of perennial irrigation throughout large portions of the countryside also changed the diets of rural populations. Historically, Egyptians had relied for sustenance on grain crops that included barley, millet, and wheat.<sup>28</sup> By the early twentieth century, corn had replaced other traditional grains to become a staple in rural diets, especially in the Nile Delta. It was also one of Egypt's top-ranking exports. The crop's growing season resembled that of cotton, meaning that as perennial irrigation spread, so did the cultivation of corn.<sup>29</sup> It was also durable, and its kernels easily stored. Finally, corn required less labor than other staple grain crops, important traits when considering the extended calendar of labor associat-



and enlarge its reservoir and the surface area of land that it irrigated and, by extension, the proportion of Egypt's population who suffered the diseases that were embedded in this landscape. The regime that made this choice was not controlled by foreign powers but rather comprised of the Egyptian elite. In 1919, a revolt protesting the continued British occupation had erupted. By 1922, Egypt had renegotiated its relationship with the colonial power and while Britain continued to exercise a decisive role in the country, its government was firmly in the hands of Egyptian elites.<sup>33</sup> Under this regime, Egypt's economy continued to rely heavily on export-oriented, cash crop agriculture (cotton in particular), and the social relations of the countryside persisted much as they had during the occupation.

Control of the Nile River was an important tenet of Egyptian nationalism. Before World War I, the British had begun construction on the Gezira scheme in Sudan, an agricultural region that they hoped would be one of the largest cotton-growing areas in the world.<sup>34</sup> In 1919, when the war had ended and the British sought to construct irrigation works in their possessions to the south of Egypt, a heated debate flared concerning the impact these works would have on the quantity of Nile water available to Egypt. In what would prove an enduring problem, Egypt felt its vulnerability as the furthest downstream country. When the British completed the Sennar Dam, which helped to water the Gezira scheme, tension between the countries intensified and, in an attempt to stake its claim to the Nile, Egypt invited an international commission to assess the safety of raising Khazan Aswan.<sup>35</sup>

The commitment to a dammed Nile River set the country on a particular path. Egyptian political officials not only understood the Nile River as an important feature of their landscape, culture, and history, but national development was also associated with a dammed Nile and water-intensive agriculture.<sup>36</sup> While British authorities had made almost no effort to address the epidemic of disease that raged in the countryside, during the interwar period, national development was paired with public health outreach. Hookworm and schistosomiasis were of particular interest. Effective treatment for the former had existed since the late nineteenth century; that for schistosomiasis had been introduced to Egypt around the period of World War I. Beginning in the 1920s, the Egyptian Public Health Department established treatment centers for schistosomiasis and hookworm in Egypt's cities and throughout the towns of the countryside. While the month-long treatment regimen for schistosomiasis caused considerable discomfort, even pain, by the 1940s, approximately 400,000 patients were treated for schistosomiasis each year in these clinics.<sup>37</sup>

Despite treatment, large numbers continued to suffer from schistosomiasis. Even when they were cured of the disease, the vast majority were reinfected with their return to rural life and labor. The lack of infrastructure in Egyptian villages meant that irrigation canals continued to occupy a prominent role in village life, and for cultivators, there was no way to avoid the physicality of irrigation and the

threat of parasitic infection that it posed. While physicians and political officials alike acknowledged that the efficacy of treatment was limited, there was no suggestion that the dam or the patterns of agricultural production that it supported might be undone. A particular archetype of national development had been normalized: like the heightening of the dam, mass treatment demonstrated scientific and bureaucratic sophistication, furthering the cause of national development.

In 1952, a group of junior army officers orchestrated a popularly supported coup that forced the Egyptian monarchy from power. Two years later, one of these young officers, Gamal 'Abd al-Nasser, became Egypt's president. Under his leadership, Egypt became a populist authoritarian state, animated by Nasser's fiercely anticolonial politics. Before the coup, Egyptian politicians had debated the prospect of replacing Khazan Aswan with a hydroelectric dam; the project became a priority in the early days of Nasser's presidency.<sup>38</sup> For funding, Egypt first negotiated with the United States and Great Britain. When Nasser refused to bow to the political conditions attached to the aid—specifically to back down from his conflict with Israel and position Egypt as a quiescent Cold War client state—each country in turn withdrew its support.<sup>39</sup> The Soviet Union stepped in with an offer of financing and soon after, in July of 1956, Nasser nationalized the company that administered the Suez Canal, announcing his intention to use its profits to fund the construction of a new dam on the Nile. In an attempt to corral Nasser's ambition and quash his regional influence, Britain, France, and Israel attacked Egypt, withdrawing their forces from Egyptian territory only after pressure from the United States. While the war was a military defeat for Egypt, Nasser emerged a hero for his willingness to stand strong in the face of neocolonial aggression. In 1958, Egypt and the Soviet Union agreed on the terms of financing and, in 1960, construction on the High Dam began.

The potential of the Aswan High Dam to transform Egypt figured prominently during Nasser's rule (1954–1970). The period of its construction witnessed the implementation of reforms that sought to lift Egyptians from poverty and address the dramatically unequal distribution of wealth that had marked the time of the British occupation and that of the interwar period. The era of Nasser's rule saw the implementation of several land reforms, the championing of the rural poor, an endeavor to end the country's dependence on export-oriented agriculture, and the development of Egypt's industrial sector. However, like the regime he had helped topple, Nasser understood the performance of technological mastery and environmental claim-making as central to nationalist development. This time, it was not water for cotton but electricity to power Egyptian industry and light the countryside that fueled enthusiasm for the dam.

When construction was ongoing, Nasser's regime prepared for the possibility that an increase in the prevalence of schistosomiasis would follow the dam's com-





pated. When Khazan Aswan was built, schistosomiasis had been endemic throughout Egypt while malaria had been confined to particular regions of the northern Nile Delta. By the 1970s, this was no longer the case.<sup>46</sup> Schistosomiasis had spread into new territories, eventually becoming the more common cause of disease.<sup>47</sup> It is likely that this migration began decades before the High Dam was built. When he conducted his nationwide survey in the 1930s, Scott wondered whether schistosomiasis had begun to move beyond its historically endemic territories. Residing in the intestinal system, the species produces a slightly different set of symptoms and sometimes a more severe form of disease than malaria. While the geographies of infection shifted, the profile of who was most vulnerable did not. Among the rural poor, men fell ill in greater numbers than women and rates of infection were highest from childhood through the early years of adulthood.<sup>48</sup>

In the past several decades, the transmission of schistosomiasis has been eliminated or greatly reduced throughout the Middle East and North Africa.<sup>49</sup> Its prevalence is highest in Yemen, which has been destroyed by a Saudi bombing campaign and is wracked by civil conflict. As of 2014, there were approximately 12.7 million individuals infected with schistosomiasis in the Middle East and North Africa, about 10 million of them in Egypt and Yemen. In 2016, estimates placed the nationwide rate of infection in Egypt at 0.2 percent of the population.<sup>50</sup>

This tremendous reduction can, in large part, be attributed to the development of a new and effective oral therapy, Praziquantel, in the 1970s. As patients no longer needed to submit themselves to lengthy courses of injections, treatment could be administered on a large scale and indiscriminately, especially to high-risk populations like children who had not been tested for the presence of the disease. The use of this drug, in conjunction with snail control efforts, health education, and sanitary infrastructure improvements, allowed Egypt's government to gain the upper hand over an epidemic that had haunted the country for almost a century. Other less intentional developments also likely altered the course of the disease. In the 1980s, crayfish were introduced in the Nile Delta for aquaculture and spread rapidly. These creatures happen to prey on the species of snails that serve as the intermediate hosts for schistosomiasis parasites.<sup>51</sup> In recent years, the end of schistosomiasis in Egypt has finally come into view. In 2016, the Egyptian government announced a plan in cooperation with the World Health Organization to eliminate schistosomiasis by 2020.<sup>52</sup> At the time of writing, the results of this endeavor had not yet been announced.

While the Aswan High Dam did not have the anticipated effect on the landscape of environmental disease in Egypt, the harms that have flowed from the dam's construction have been considerable. Nearly 100,000 members of Egypt's Nubian community— and a larger number in Sudan— were displaced and much displaced and

in the town of Kom Ombo, relatively distant from the Nile and the life ways that had once sustained them.<sup>53</sup> The dam's reservoir, Lake Nasser, flooded a number of archaeological sites in Egypt and Sudan. Some, like Abu Simbel, were moved to other locations. Others were gifted to museums abroad and a handful are submerged in the waters of the lake.<sup>54</sup> The effects of the High Dam on the riparian environment have also been substantial.<sup>55</sup> Deprived of adequate sediment, Egypt's northern coastline has eroded; a significant quantity of agricultural land has disappeared; the soil is no longer as productive as it once was; and commentators have long debated the impact of the dam on fish populations in the Mediterranean Sea.

One wonders whether large dams like the Aswan High Dam are one of the great postcolonial traps, destined to pit those who are concerned about their environmental effects and cultural erasures against those who are seeking resources and national development according to the terms that came to predominate in the twentieth century. As the construction of large dams accelerates, many governments find themselves faced with a set of dilemmas resembling those confronted by the Egyptian regime more than sixty years ago. In the short term, agricultural productivity, protection from the variability of floods, and the provision of electricity are attractive prospects. So is the national pride and political favor that attaches to the construction of infrastructure. However, this thirst for resources and development often produces a skewed vision of the cost of dam construction, one that omits the significant price of damage to the environment, public health programs, and the civilian infrastructure necessary to mitigate their effects.

In Egypt, the long history of damming the Nile has also produced consumption habits and expectations that are ill-suited for a world in which resources are ever scarcer. Two of Egypt's most important crops—rice and sugarcane—are both water intensive. Recently, the government has made moves to limit rice cultivation, these policies landing hardest on the farmers who grow the crop. Neither is there a deep history of water conserving irrigation.<sup>56</sup> The current controversy in Egypt that surrounds the construction of the Grand Ethiopian Renaissance Dam (described in Harry Verhoeven's essay in this issue of *J. of ...*) is in part rooted in the government's long-standing concern about the vulnerability produced by its position on the Nile and the tiny amounts of rain that fall in its fields each year.<sup>57</sup> It also stems from the reality that the government will be forced to confront the country's water poverty, which the long history of the dammed Nile has allowed it to avoid.

How Egyptians will experience a future that will be further freighted by the challenges of climate change, among them water security, will, like the country's history of dams, be shaped by questions of political economy and the technologies of power. Khazan Aswan was built under a colonial regime to support a form of agricultural production that servebe shaola

classes. The Aswan High Dam was imagined as an escape from the geopolitical relationships and material constraints of the past. And yet, like the dam that preceded it, it was a manifestation of environmental authoritarianism. Not only did the government dictate the pathways of water, power, and displacement; it mandated the chemical treatment of human bodies and the environment in order to combat the harms that flowed from the dammed Nile. The strategies that Egypt's current regime deploys to respond to climate change will be similarly shaped by its aggressive authoritarianism, the absence of legitimate channels through which to express dissent, and the interests of the ruling classes, the military primary among them.

If there are lessons to be learned, it is the intractable relationship of human and environment health and the persistent influence of social and economic structures in shaping these terms. History accretes in the body. On global as well as



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