

Approaching the history of an Egyptian biomedicine

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Abstract

This piece explores the history of medicine in Egypt, the roots of an Egyptian practice of biomedicine in particular, through its historiography. In the period after World War II, the term “biomedicine” came to describe a practice of medicine defined by the close relations among clinicians, biological laboratory research, and the pharmaceutical industry in Europe and the United States. The history of medicine in Egypt and other parts of the Middle East and North Africa has long possessed close links to that in regions of Europe. In Egypt too, biomedicine has deep historical roots shaped by the influence of the nineteenth-century Ottoman-Egyptian state, the experience of colonialism, and the anti-colonial objectives of the post-colonial Egyptian state in the second half of the twentieth century. These influences were particularly important in relation to the treatment of schistosomiasis, one of Egypt's top-ranking health problems of the twentieth century. The history of schistosomiasis demonstrates the gaps in the historiography of medicine in modern Egypt as well as how we might begin to consider the emergence of biomedical knowledge and theory at sites in Global South.

To honor science and scientists has been one of the main steps of our scientific renaissance which was coupled with our revolution in July 1952. The revolutionary government had honored science and gave it its rightful position, making it one of the principal foundations for the building of our modern society.¹

Dr. Salah al-Din al-Hidayat, Egyptian Minister of Scientific Research, May 1962

1 | INTRODUCTION

In early May 1962, Egyptian and German scientists, physicians, and government officials gathered together in Cairo for the “First International Symposium on Bilharziasis.” At the conference, a long list of researchers, the vast majority of them Egyptian, presented their findings concerning various aspects of the disease schistosomiasis, also known as “bilharziasis” or “bilharzia.” Caused by infection with a parasite, the prevalence of the disease in Egypt had risen dramatically in the early twentieth century following the damming of the Nile River. In 1962, the Egyptian government was working to complete a new dam on the Nile, the Aswan High Dam, that they anticipated would cause rates of infection to rise even higher.² The occasion of the symposium marked the establishment of the Theodor Bilharz Research Institute, which was to be dedicated to the study and treatment of the disease.³

During the 1950s and 1960s, the promotion of biomedical research, the provision of medical care, and the organization of public health campaigns were central tenets of Egyptian President Gamal Abdel Nasser's populist, anti-colonial agenda. Nasser had come to power in the aftermath of a 1952 coup orchestrated by junior army officers who were frustrated with a regime dominated by elites and the persistence of British colonial influence in the country. Egypt's president sought to position himself as an advocate for the downtrodden, his domestic agenda formulated as an antidote to the material and ideational conditions of colonialism, disease and poverty among them.

Nasser's political program was facilitated by the long-standing institutionalization of medicine in Egypt. Beginning in the second decade of the nineteenth century, the Ottoman-Egyptian state began to build hospitals, clinics, and a medical school to formally train physicians.⁴ These medical institutions became important sites for research performed by Egyptian and European medical practitioners alike. That European practitioners would be drawn to Egypt was not a development of the nineteenth century. Physicians, especially from France and Italy, had practiced in the territories of the Ottoman Empire.⁵ Shared texts, conceptual approaches to disease, and therapeutics long linked the practice of medicine in Egypt and other regions of the Middle East and North Africa to the lands on the northern shore of the Mediterranean.⁶ Through the first decades of the nineteenth century, Hippocratic-Galenic theories of disease predominated in Egypt, as in many parts of Europe.⁷ This framework posited a body composed of humors that became ill through their imbalance, the cause of which could be the changing seasons, climatic events, the position of the stars, or individual proclivities.

When in the nineteenth century, European colonialism arrived in the Middle East and North Africa, the intertwined histories of medicine in Europe and the territories that belonged to the Ottoman Empire took a different turn. In Egypt, the decades of the British occupation were also those in which an evolving field of human biology came to guide understandings of medicine and disease. Biomedicine is sometimes referred to as “Western” medicine, a reference to the European origins of its theories of the body and methods of intervention as well as those of the individuals credited with its development. The association of biomedicine with “the West” also gestures to the existence of alternate philosophies of the body and forms of healing in regions beyond Europe and its settler colonies. The history of medicine in Egypt fits neatly in neither of these categories: while a range of cultural and historical influences have shaped remedies and care, there has existed no comprehensive system of understanding disease and the body that would set the history of medicine in Egypt apart from that in many regions of Europe. In some parts of the globe, biomedicine is burdened by the perception that it is foreign in its history and origins. In Egypt, the history of biomedicine is also freighted, but more often with the character of the state with which it has been associated, its methods of coercion, and its failures.

In this piece, I trace the history of biomedicine in Egypt through its historiography and the silences of this body of work.⁸ My exploration begins in the first half of the nineteenth century with the formation of the “modern” Egyptian state and ends in the 1960s with the rising significance of global pharmaceutical and chemical companies in the practice of medicine. At the center sits the epidemic with which I began, that of the parasitic disease schistosomiasis, which for a century, was one of the primary threats to the health of Egypt's population. It was in the institutions of the Ottoman-Egyptian state that Europeans first “discovered” schistosomiasis. In the colonial

period, Egypt came to be a center for research on the disease, which contributed to the emergent field of tropical medicine. The mass treatment programs that were organized by the state beginning in the interwar period and stretching throughout the decades of the twentieth century were, for many, their first encounter with institutional medicine. In Europe and the United States, the term “biomedicine” came into use in the period after World War II to describe a practice of medicine rooted in the close relations among clinicians, laboratory research, and industry. Such a formation also took shape in Egypt, molded by the particular relationship of medicine to the state as well as the country's colonial and anti-colonial history.

2 | THE INSTITUTIONS AND BUREAUCRATS OF MODERN STATE MEDICINE

In the historiography of Egypt, the practice of “modern medicine” traces its roots to the first half of the nineteenth century. It was in this period that the hospitals that would function as biomedical institutions in the twentieth century were established and practitioners began to be trained through a formal curriculum. A province of the Ottoman Empire since the early sixteenth century, in the early nineteenth century, Egypt became the realm of a new governor, Mehmed Ali (r. 1805–1848), who built a modern state through the construction of an extensive bureaucracy, the conscription of a military, and the deployment of new forms of coercion, surveillance, and bodily control.⁹ Mehmed Ali's interest in medicine was driven by his desire to build a strong military.¹⁰ After the Sudanese slaves who he intended to be soldiers died in large numbers, many from disease, Mehmed Ali began to conscript Egyptian peasants and implemented measures to ensure their health.¹¹ In 1827, he built hospitals for the military at Abu Za'bal on the outskirts of Cairo and in the coastal city of Alexandria.¹² At Abu Za'bal, he also established Egypt's first modern medical school, which a decade later moved to its current location at Qasr al-'Ayni along with the hospital to which it was attached.

While it was first developed to maintain the health of the military, the new state medical apparatus eventually treated civilian populations as well. In 1819, the state began to vaccinate tens of thousands of its civilians against smallpox.¹³ This practice was not unfamiliar. Midwives had long used variolation to protect children against smallpox. In the 1840s, it was reported that it was common for nomad populations of the deserts and oases to vaccinate themselves with cowpox; it is not known when vaccination began.¹⁴ In Cairo, the state also established a hospital for civilians in the neighborhood of al-Azbakiya and an ophthalmic hospital and string of clinics to treat the eye diseases for which the country was infamous.¹⁵ In the 1840s, general hospitals and clinics were built in towns that lay far from the capital.¹⁶ During this same period, private European hospitals were established, which treated their resident communities as well as Egyptians.¹⁷

The physicians who staffed Egypt's new medical institutions belonged to a new class of state bureaucrats.¹⁸ The medical school at Qasr al-'Ayni was one piece of a larger state project that trained technocrats. Before the nineteenth century, officials of the Ottoman state usually hailed from distant regions of the empire and were Ottoman Turkish in their linguistic and cultural orientation. One of the legacies of Mehmed Ali's state was the education and inculcation of Arabic-speaking Egyptian state bureaucrats, among them physicians, who came to understand themselves as part of a new middle class.¹⁹ Those trained at the medical school were male; a separate state system trained female practitioners.²⁰ When it was first founded, the school had a difficult time attracting students as its mission was unfamiliar to the population. The first Egyptians trained as modern physicians were not of the elite but instead came from peasant families and received financial support from the state while they pursued their education.²¹

In his project to build a new state form in Egypt, Mehmed Ali drew inspiration from outside of the Ottoman Empire. It is important to note that unlike those appointed during the British occupation, the Europeans who held state positions under Egypt's viceroy served at his pleasure and in pursuit of his objectives. Soon after Qasr al-'Ayni was established, Mehmed Ali appointed the French surgeon Antoine Bartholomew Clot—Clot Bey as he was known in Egypt—to lead the institution, a position he dominated for more than three decades. While the faculty were mostly French and Italian in the early years of its existence, Qasr al-'Ayni's identity began to shift in the 1830s with

the appointment of Egyptians to the faculty. In 1847, Muhammad Shafi'i became the first Egyptian director and from 1858 until the British took control during the occupation, the leadership of the institution was exclusively Egyptian as were most members of the faculty.²² When Muhammad 'Ali al-Baqli was director (1863–1876), all but one of Qasr al-'Ayni's faculty members were Egyptian.²³

3 | APPROACHING DISEASE

While medical institutions and training were made modern through their association with the state, during the first half of the nineteenth century, the theories of disease that prevailed within them differed significantly from those that would hold sway by century's end. In Egypt and in Europe, this was a period marked by heterogeneity and change in the field of medicine. Because of his prominence and his multiple and easily accessible publications, the figure of Clot dominates much of the historiography focused on Egyptian medicine. Clot followed the physiological school, which attempted to link the symptoms experienced by living patients to observations of organ abnormality or injury that were made during autopsies.²⁴ He was a partisan of the French physician, surgeon, and pathologist François Broussais who theorized that disease originated with an irritation that spread through the organs of the body, causing inflammation and a change in function.²⁵ Clot did not believe that illness could be caused or spread by contagion. When epidemics of cholera and plague struck Egypt in the 1830s, Clot was opposed to the implementation of quarantines as he believed that the source of disease was miasma, or the bad air that emanated from spaces that were dank, musty, and lacked proper ventilation.²⁶

While his imprint was strong, Clot was only one influence on the early history of modern medicine in Egypt, even among the Europeans appointed to Qasr al-'Ayni. When the aforementioned epidemics struck in the 1830s, Mehmed Ali adopted containment measures designed to target both contagion and miasma, splitting the difference between Clot and the contagionists.²⁷ During his brief tenure as director of Qasr al-'Ayni, the German pathologist Wilhelm Griesinger was the first European to link the symptoms of hookworm disease to the presence of *Ancylostoma duodenale* parasites in the body. Soon after, his student Theodor Bilharz, who was also on faculty, was the first European to hypothesize that the *Schistosoma* parasites that he located in the organs of autopsy patients were the cause of the blood in the urine that many Egyptians suffered.²⁸ Decades later, at the turn of the nineteenth century, hookworm and schistosomiasis would come to be central concerns of the field of tropical medicine in Egypt.

The Egyptian physicians who worked with Griesinger and Bilharz certainly made their own discoveries and observations. There is evidence that Egyptian physicians penned important works of their own in addition to the annotated translations of the foreign medical texts that they produced.²⁹ Medical students studied a wide array of topics that included physics, chemistry, pathology, anatomy, hygiene, and pharmacy.³⁰ After graduation, the most promising students were sent to Europe, usually France, for additional training.³¹ By 1864, there was a chemical laboratory at Qasr al-'Ayni.³² For a brief period, the institution published its own medical journal in Arabic.³³ While there is reason to believe that Egyptian approaches would have shared much in common with those that were prominent in Europe, critical considerations of the work produced by Egyptians are sorely lacking in the historiography of medicine in nineteenth-century Egypt.³⁴ The heavy historiographical emphasis on Europeans works to anachronistically produce a colonial history of medicine in a period in which Egyptians were also active in medical practice and thought.

While important to the state, the reception of new medical interventions was more troubled, and their impact uneven among the population.³⁵ With the exception of vaccination campaigns, the historiography does not elaborate on what types of therapeutic interventions were on offer in the state's hospitals, whether these interventions were effective, or how the nature of treatment evolved. In the countryside, Egyptians avoided the state's medical officials and facilities, at times resisting medical interventions with force.³⁶ These responses were rooted in the nature of the state's intrusions in other realms of their lives, which included military conscription, forced labor, and the extraction of large taxation burdens. When the state first began to vaccinate against

smallpox, there was tremendous opposition among rural populations who feared that their children were being marked for conscription.³⁷ In urban areas, populations seemed relatively more receptive to new medical institutions and practices. While the rich preferred to be treated at home, there is evidence to suggest that some urban dwellers patronized new hospitals and clinics.³⁸ Forensic medical examination was another means through which civilians engaged state medicine and it was not uncommon for individuals to seek it out to provide evidence in court or against the police.³⁹ Throughout, a kind of curative eclecticism prevailed among the population. Even among those who sought care at hospitals, local practitioners who included barbers, bonesetters, and midwives continued to be important as were resorts to the divine through popular Muslim, Christian, and Jewish spiritual practices.⁴⁰

4 | COLONIAL CLAIM MAKING

During the four decades of the British occupation, Egypt's hospitals and medical school were restructured to reflect colonial hierarchies. In 1893, just a little more than a decade after the occupation began, colonial officials took control of Qasr al-'Ayni, bringing a period of more than three decades of Egyptian leadership to a close. European—most often British—physicians were appointed to lead its various departments and the language of instruction was changed from Arabic to English.⁴¹ Egyptian physicians remained at the institution but as assistants to Europeans, often appointed to departments that were other than their area of specialization.⁴² The status of female practitioners declined even further.⁴³ During the occupation, the numbers of physicians trained remained relatively small, in part due to the cost of a medical education.⁴⁴ The British implemented a system whereby education at Egypt's professional schools was fee-based and graduates were expected to travel to England for additional training.⁴⁵ Consequently, many medical students came from more elite families than the physicians of an earlier period.⁴⁶ Moreover, Egyptians complained that the training they received was intentionally insufficient and worked to relegate them to inferior positions.⁴⁷

In Egypt, the coalescence of a field of tropical medicine at the turn of the nineteenth century was tightly linked to the practice and material entanglements of colonial economy. The expansion of cotton production, most of which fed textile mills in the north of England, was one fixation of the British during their occupation of Egypt. In 1902, the first dam on the Nile River was completed and in the years that followed, the waters stored in its reservoir transformed Egypt's agricultural landscape, irrigating cotton crops and fueling a dramatic increase in the prevalence of parasitic disease, schistosomiasis in particular. While the parasites that cause schistosomiasis certainly afflicted Egyptian bodies when Bilharz and Griesinger recorded their research findings, the damming of the Nile caused the level of infection to reach epidemic proportions. The production of a particular colonial economic environment went hand in hand with the trajectory of specialization in the field of tropical medicine. Qasr al-'Ayni became a center for research on the diseases fueled by cotton production, which in addition to schistosomiasis included hookworm and pellagra, and European and North American specialists in the emergent field of tropical medicine came to Egypt for research.⁴⁸ In the first years of the twentieth century, as infections soared, so did the number of research publications that described disease in Egyptian bodies.⁴⁹

While the environment was rich in opportunity for European physicians, Egyptians were sidelined and their authority undermined. The hierarchies and systems of attribution that marked the colonial period worked to hobble the production and visibility of research by Egyptian physicians. The growing importance of English-language medical journals in the citation of scientific discovery also placed them at a considerable disadvantage. Nonetheless, Egyptian physicians were important, if often unacknowledged, actors in the practice of medicine and the execution of medical research. The work that these “assistants” performed as translators and cultural interlocutors surely played a decisive role in clinical contexts. Moreover, Europeans often relied on their Egyptian colleagues to conduct research outside of the hospital. Among the sparse records of research productivity among Egyptian physicians is one of the first local surveys of schistosomiasis, which was performed by Muhammad Tal'at, who was

the assistant to Fleming Mant Sandwith, the first English professor of clinical medicine at Qasr al-'Ayni and the former vice director of the Sanitary Department.⁵⁰ As the structure of colonial medical authority meant that the Egyptians who were central to its production were often not credited, it is rare for work like Tal'at's to be visible in the historical record.

5 | ANTI-COLONIAL BIOMEDICINE

With the formation of a quasi-independent regime in 1923, Egyptian physicians and scientists rose to new positions of authority in the Public Health Department, at the medical school, and within hospitals.⁵¹ By 1929, Egyptians were again in leadership positions at Qasr al-'Ayni and the institution became a faculty of the Egyptian University (now Cairo University).⁵² During the interwar period, parasitic infections continued to sicken Egypt's rural population. Cotton maintained its position as Egypt's top-ranking export; the irrigation practices that supported it and the ecologies in which parasites thrived continued to spread throughout the countryside. By the 1930s, approximately 60% of the population suffered from schistosomiasis. In areas that grew cotton, the prevalence of the disease could be much higher.⁵³ For the Egyptian physicians of the interwar period, access to populations infected with schistosomiasis and ongoing outbreaks of disease represented unique opportunities to register their authority and contributions in a world of medical research that continued to be structured by colonial hierarchies.⁵⁴

Treatment programs for hookworm and schistosomiasis were the first occasion on which the state aggressively promoted to the population a medicine that was rooted in emergent notions of biology and laboratory science. In 1922, Egyptian physician Muhammad 'Abd al-Khalīq Khalīl was appointed to direct the "Bilharzia Research Unit" of the Department of Public Health. Khalīl had graduated from Qasr al-'Ayni before moving to London to work with Robert Leiper, a leading expert on parasitic disease. Under his leadership, the Public Health Department began a nationwide testing and treatment campaign for parasitic disease. Beginning in the 1920s, clinics were built in cities, large towns, and heavily-impacted regions of the countryside to treat hookworm and schistosomiasis. Urine and stool samples were examined for the presence of parasites; those who were infected were offered treatment.⁵⁵ It proved relatively easier to treat hookworm than schistosomiasis, whose month-long treatment regimen with an antimony-derived compound caused considerable discomfort. In 1934, working with a German scientist in the Bayer AG division of the German chemical company IG Farben, Khalīl and Egyptian scientist M.H. Betache unveiled a shorter treatment for the disease, "Fouadin," named after Egypt's king.⁵⁶ Both regimens were used in hospitals and clinics.

When treatment began, it was neither welcomed by the population nor free of coercion. Most rural Egyptians did not understand the presence of disease in their bodies through emergent notions of human biology. During the occupation, exposure to institutional medicine had been minimal, especially in rural areas. Occupation officials did not believe the state should play a role in public health and the hospitals located in cities and large towns charged a fee, placing their services out of reach for the vast majority of Egyptians.⁵⁷ In 1914, when the first small-scale campaign was organized to treat hookworm, one of its lead physicians reported that patients were beaten to force them to accept treatment.⁵⁸ There are no such reports from the facilities established during the interwar period. In the decades that stretched from the 1920s, the numbers of patients who visited treatment facilities rose exponentially. By the 1940s, more than 400,000 patients received treatment for schistosomiasis at state facilities each year.⁵⁹ Physicians reported crowds at rural clinics and some of those who suffered the worst ravages of severe and complicated infection traveled great distances to seek relief at hospitals. Nonetheless, manifest through the social hierarchies that dominated the countryside, coercion likely continued to play an important role in mediating the relationship between patients and the state's medical apparatus. Wealthy landowners exercised an enormous amount of power in rural Egypt, especially with respect to the populations who resided on and cultivated their land as sharecroppers and wage laborers. Many of these landowners worried about the ravages of widespread parasitic disease on the productivity of their laborers.⁶⁰

In the 1950s and 1960s, medicine became part and parcel of an anti-colonial state agenda. The populist authoritarian regime of President Gamal Abdel Nasser (r. 1954–1970) sought to undermine the power of the elite through land reform and to implement state programs that ameliorated the grinding poverty that was common in the countryside. In the 1940s, the former regime had begun to take steps to increase access to medical care and the number of physicians in rural areas. In this endeavor, it built health care centers and faculties of medicine were established at 'Ain Shams University and Farouk University (now Alexandria University).⁶¹ Under Nasser, these efforts expanded further. Between 1951 and 1963, the state budget devoted to healthcare nearly quadrupled,⁶² so did the number of hospitals and clinics increase.⁶³ Some rural clinics were staffed by recent medical school graduates, who were required to fulfill a period of government service when they completed their training.⁶⁴ It was also under Nasser that the state endeavored to provide health care free of charge to the population.⁶⁵

Schistosomiasis remained Egypt's primary challenge in the field of public health. The state continued to treat the disease, expanding access through its new facilities. Many Egyptian medical students chose to specialize in the field of tropical medicine, which treated a large subset of those infected with the disease.⁶⁶ The state also promoted medical research, one manifestation of which was the establishment of the Theodor Bilharz Research Institute, which was supported by funds from the West German government. After 1956, Nasser's state aggressively promoted a program of state-led industrialization of which pharmaceuticals were one piece. Egyptian news magazines featured photoshoots of their production lines, staffed by white-coated Egyptian workers.

So were the state's environmental interventions important to the practice of Egyptian biomedicine. Because patients returned to rural life and the unavoidable forms of agricultural work through which they became infected, treating the human body alone had failed to produce the desired reduction in the prevalence of schistosomiasis. In the irrigation drains and canals that supported agriculture, tiny freshwater snails lived in abundance, these organisms serving as the intermediate hosts for *Schistosoma* parasites. In their absence, parasites are unable to proceed through a cycle of physical transformation that enables them to infect human beings. Efforts to develop effective means through which to kill snails had been underway since the 1920s.⁶⁷ During the 1950s and 1960s, this endeavor became global, and multi-national pharmaceutical and chemical companies, one mark of post-colonial Egyptian biomedicine. Officials at international organizations that included UNICEF and the World Health Organization, whose Eastern Mediterranean Regional Office was located in Alexandria, developed an acute interest in the project; so did foreign governments. West Germany was particularly eager to promote the products produced by their own Bayer AG. Multiple field experiments testing chemicals against snails were conducted in Egypt during the 1950s and 1960s.⁶⁸ One wonders whether such experiments could have been conducted in the United States or Europe as in addition to their stated aim, these experiments functioned as largescale tests of the toxicity of the various chemicals used.

6 | AN INDIGENOUS AND IMPOVERISHED BIOMEDICINE

Schistosomiasis continued to represent a significant threat to rural populations in Egypt until an oral therapy was developed and made widely available in the 1980s that was inexpensive, less toxic, and could be administered preventatively. The history of the disease's persistence was also that of poverty, social inequality, and inadequate civilian infrastructure. Worldwide, schistosomiasis continues to afflict 240 million individuals; over 90% of this number lives on the African continent. Consequently, despite a dramatic reduction of its prevalence in Egypt, schistosomiasis is one of the primary "Neglected Tropical Diseases" and is a frequent target of global public health initiatives.

The Egyptian history of schistosomiasis is a useful lens through which to approach the historiography of biomedicine in Egypt and the gaps in this body of scholarship. Its textbook version begins with the discoveries of Europeans. And yet, Bilharz did not come to fixate on *Schistosoma* parasites in a European lab nor was he toiling in a small village. He found the object of his interest in an Ottoman-Egyptian state laboratory in Cairo where many of

his colleagues were Egyptian. The fact of this setting begs the question of what other stories might be told about the development of medical knowledge, including that pertaining to schistosomiasis, in nineteenth-century Egypt. The historiography of Egyptian medicine during this period is predominantly a social history. When it considers questions of theory, this body of scholarship relies on accepted tropes of European discovery. A closer look at the work of Egyptian physicians might facilitate a different telling of the history of this “tropical” disease.

Beginning in the interwar period, schistosomiasis became an Egyptian national cause. It remained so during the years of Nasser's presidency. Despite the populist politics of Nasser's regime, access to biomedicine in Egypt remained stratified and deeply uneven. When Nasser died in 1970, war, corruption, and the high cost of social welfare programs had hobbled the project to provide the population with access to quality medical care. In addition to the state system that I describe in this piece, a parallel private system also formed during the nineteenth century and persisted, even alongside the development of a robust public sector in the 1960s. Private medicine expanded further with the state's divestment from its social welfare system, which began in earnest in the 1970s. The vast majority of those who suffered from schistosomiasis were rural and poor. This was increasingly true during the second half of the twentieth century, which with declining state investment, meant their experience of biomedicine was of crumbling facilities, inadequate supplies, outdated technologies, and poorly compensated physicians.

Patients are, however, only one component of the equation. Practitioners are also biomedical subjects. While the concept of “biomedicine” dates to the period after World War II, in Egypt, the culture and history of its experts predate this period. Since the founding of Egypt's first modern medical school, the class origins, gender, and politics of Egyptian physicians have shifted as have approaches to the theory and practice of medicine. Nonetheless, for almost two centuries, “medicine,” in its various forms, has functioned as a guiding ideology. In the twentieth century, this ideology was rooted in a particular incarnation of biomedicine, shaped by Egypt's history, as well as the travel of ideas, practices, and structures—some marked by differentials of power—from other parts of the globe. Today, that many Egyptian physicians work for little pay in unenviable conditions does not somehow undermine their status as biomedical subjects nor does it foreclose the possibility of innovation.

The historiography of biomedicine in the second half of the twentieth century in Egypt is characterized by some of the same gaps that mark the earlier period. With the waning of colonialism, schistosomiasis was no longer a topic of interest for scientists in Europe and the United States. It was rather physicians in the Global South who sat at the forefront of clinical research, many of whom worked in conditions of relative impoverishment. Despite this fact, there is little scholarship that describes their work. For many, the history of biomedicine is—or should be—a progress narrative in which better technology is understood to produce lives less troubled by disease. And yet, while the high cost of research has meant its concentration in resource-rich geographies, the production of biomedical knowledge occurs even where such resources are scarce. While the practice of biomedicine is global, the material conditions that frame its theory, practice, and development are not universal. Medicine is shorthand for a wide range of different therapeutic contexts within which the production of knowledge is specific. The history of schistosomiasis in Egypt is but one example of the existence of other geographies of knowledge and the potential richness of other paths of historical investigation.

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ENDNOTES

- ¹ “Speech,” Dr. Salah al-Din al-Hidayat, *Proceedings of the First Annual Symposium on Bilharziasis*, Organized by the Ministry of Science Research, May 3–9, 1962, 7.
- ² Ibid, 9.
- ³ Interview with an Egyptian physician who also directed the Institute, March 3, 2020 (Name withheld because of conditions of IRB approval).
- ⁴ European consuls and religious communities also began to build hospitals during this period. See Shana Minkin, *Imperial Bodies: Empire and Death in Alexandria, Egypt* (Stanford, CA; Stanford University Press, 2020), 17–44.

- ⁵ Kuhnke, *Lives at Risk*, 29; Sonbol, *Creation of a Medical Profession*, 35–36.
- ⁶ Kuhnke, *Lives at Risk*, 27–28.
- ⁷ Ibid, 28.
- ⁸ The body of historiography that informs this piece is the English-language historiography. There also exist in Arabic important historical works treating the history of medicine in the country. While many of the themes in the different bodies of work echo one another, I have not been able to cite the Arabic-language historiography because of the difficulties of access created by the ongoing COVID-19 pandemic.
- ⁹ For a detailed treatment of this argument, see Khaled Fahmy's *All the Pasha's Men: Mehmed Ali, his Army, and the Making of Modern Egypt* (Cairo: The American University in Cairo Press, 2002).
- ¹⁰ Ibid, 12.
- ¹¹ Fahmy, *All the Pasha's Men*, 86–89, 92; Sonbol, *Creation of a Medical Profession*, 39.
- ¹² Sonbol, *Creation of a Medical Profession*, 103; Fahmy, *All the Pasha's Men*, 212.
- ¹³ Kuhnke, *Lives at Risk*, 111–121, 134–135; Sonbol, *Creation of a Medical Profession*, 48–49; Fahmy, *All the Pasha's Men*, 210; Hibba Abugideiri, *Gender and the Making of Modern Medicine in Colonial Egypt* (NY, NY: Routledge, 2016), 45–47.
- ¹⁴ Kuhnke, *Lives at Risk*, 113.
- ¹⁵ Sonbol, *Creation of a Medical Profession*, 48.
- ¹⁶ Kuhnke, *Lives at Risk*, 138–140, 142; Sonbol, *Creation of a Medical Profession*, 49.
- ¹⁷ Minkin, *Imperial Bodies*, 22–23.
- ¹⁸ Sonbol, *Creation of a Medical Profession*, 33.
- ¹⁹ Ibid, 36–37, 74.
- ²⁰ See Khaled Fahmy, “Women, medicine and power in nineteenth-century Egypt” in *Remaking Women: Feminism and Modernity in the Middle East* edited by Lila Abu-Lughod (Princeton: Princeton University Press, 1998), 35–72.
- ²¹ Sonbol, *Creation of a Medical Profession*, 26–27, 57.
- ²² Abugideiri, *Gender and the Making of Modern Medicine*, 32; Khaled Fahmy, *In Quest of Justice: Islamic Law and Forensic Medicine in Modern Egypt* (Berkeley, CA: University of California Press, 2018), 44; Abugideiri, *Gender and the Making of Modern Medicine*, 32, citing Naguib Mahfouz, *The History of Medical Education in Egypt* (Cairo: Government Press, 1935), 94. Kuhnke, *Lives at Risk*, 49.
- ²³ Mahfouz, *History of Medical Education*, 94; Kuhnke, *Lives at Risk*, 47.
- ²⁴ Kuhnke, *Lives at Risk*, 36–37; Sonbol, *Creation of a Medical Profession*, 62–63; Fahmy, “Medicine and Power,” 26–27 (2000).
- ²⁵ Kuhnke, *Lives at Risk*, 36–37.
- ²⁶ Fahmy, *In Quest of Justice*, 56.
- ²⁷ Kuhnke, *Lives at Risk*, 49.
- ²⁸ Kuhnke, 31, 37, 45; Jennifer L. Derr, *The Lived Nile: Environment, Disease, and Material Colonial Economy in Egypt* (Stanford, CA: Stanford University Press, 2019), 116–117.
- ²⁹ Sonbol, *Creation of a Medical Profession*, 60–61, 94–97; Fahmy, *In Quest of Justice*, 206; Fahmy, *All the Pasha's Men*, 217; Abugideiri, *Gender and the Making of Modern Medicine*, 37–38.
- ³⁰ Sonbol, *Creation of a Medical Profession*, 66–67.
- ³¹ Among the first class of students to graduate from Qasr al-'Ayni, 12 were dispatched to France, returning in 1831. Sonbol, 72–75, 77.
- ³² Fahmy, *In Quest of Justice*, 179–180.
- ³³ Kuhnke, *Lives at Risk*, 47.
- ³⁴ The exception to this characterization being Khaled Fahmy's *In Quest of Justice*, which explores the content of this work in relation to autopsies and post-mortem examinations and also food, specifically market regulations.
- ³⁵ Fahmy, *All the Pasha's Men*, 213.
- ³⁶ Kuhnke, *Lives at Risk*, 116–118; Sonbol, *Creation of a Medical Profession*, 82; Fahmy, *All the Pasha's Men*, 225–226.
- ³⁷ Kuhnke, *Lives at Risk*, 116–119.
- ³⁸ Minkin, *Imperial Bodies*, 20.
- ³⁹ Khaled Fahmy, “Women, Medicine and Power in Nineteenth-Century Egypt,” 61; Ibid, “The Police and the People in Nineteenth-Century Egypt,” *Die Welt des Islams* New Series, 39, no. 3 (Nov., 1999b), 366–7; Ibid, “The Anatomy of Justice: Forensic Medicine and Criminal Law in Nineteenth-Century Egypt,” *Islamic Law and Society* 6, no. 2 (1999a): 224–271; Liat Kozma, *Policing Egyptian Women* (Syracuse, NY: Syracuse University Press, 2011); Liat Kozma, “Negotiating Virginity: Narratives of defloration within late nineteenth-century Egypt,” *Comparative Studies of South Asia, Africa and the Middle East* 24, no 1 (2006): 55–65.
- ⁴⁰ Derr, *The Lived Nile*, 114–115.
- ⁴¹ Abugideiri, *Gender and the Making of Modern Medicine*, 79, 11.
- ⁴² Ibid, 89, 94, 98.

- ⁴³ Ibid, 115–157.
- ⁴⁴ Sonbol, *Creation of a Medical Profession*, 108–109; Abugideiri, *Gender and the Making of Modern Medicine*, 101–102.
- ⁴⁵ Abugideiri, *Gender and the Making of Modern Medicine*, 101–102, 108–109.
- ⁴⁶ Sonbol, *Creation of a Medical Profession*, 58, 109, 119.
- ⁴⁷ Sonbol, *Creation of a Medical Profession*, 114; Abugideiri, *Gender and the Making of Modern Medicine*, 99.
- ⁴⁸ Derr, *The Lived Nile*, 113–126.
- ⁴⁹ Ibid, 118–126.
- ⁵⁰ Ibid, 120, 122.
- ⁵¹ Ibid, 131–138.
- ⁵² Sonbol, *Creation of a Medical Profession*, 122.
- ⁵³ Derr, *The Lived Nile*, 105.
- ⁵⁴ Ibid, 131.
- ⁵⁵ Ibid, 133–134.
- ⁵⁶ Ibid, 136.
- ⁵⁷ Kuhnke, *Lives at Risk*, 8–9; Sonbol, *Creation of a Medical Profession*, 126–128.
- ⁵⁸ Derr, *The Lived Nile*, 130 citing John Farley, *Bilharzia: A History of Imperial Tropical Medicine* (Cambridge: Cambridge University Press, 2003), 78.
- ⁵⁹ Derr, *The Lived Nile*, 138.
- ⁶⁰ Ibid, 145–146.
- ⁶¹ The project to build these centers had begun in 1946. Raymond William Baker, *Egypt's Uncertain Revolution Under Nasser and Sadat* (Cambridge, MA: Harvard University Press, 1978), 219.
- ⁶² Ibid, 220.
- ⁶³ The number of rural health care units also increased, from 382 before the coup to 1525 by 1965. Ibid, 219–222.
- ⁶⁴ Some of the medical school graduates posted to rural clinics sought to evade the obligations of their service, retreating to the comforts of urban life. This system, *taklif*, dates to the period of Mehmed Ali's rule. Sonbol, *Creation of a Medical Profession*, 86–87.
- ⁶⁵ Marcia C. Inhorn, *Quest for Conception: Gender, Infertility, and Egyptian Medical Traditions* (Philadelphia: University of Pennsylvania Press, 2009), 251.
- ⁶⁶ Interviews with Egyptian physicians, March 3rd and 4th, 2020 (Names withheld because of conditions of IRB approval).
- ⁶⁷ Derr, *The Lived Nile*, 147–150.
- ⁶⁸ See, for example, Donald B. McMullen and Marshall B. Rainey, "Report on the Preliminary Survey by the Bilharziasis Advisory Team, Part II Egypt," February 20th, 1959, pg. 24, schisto1-emro-egypt 1955–1962, Archives of the Parasitology Collection, Archives of the World Health Organization.

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