

ROUNDTABLE

Hitching a Ride: Cholera, the Canal, and Quarantine

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Returning by ship from the hajj in 1902, Aida and Fatma landed at the quarantine station of El Tor, 120 miles south of the city of Suez in the Sinai Peninsula.¹ The El Tor station had been set up in the Egyptian town following international sanitary conferences convened to promote international standards for sanitary protections to safeguard Europe from “Asiatic” diseases, most notably cholera. Endemic in India for centuries, cholera had spread out of the Ganges basin in the nineteenth century through globalizing networks of trade and steam transport. The opening of the Suez Canal in 1869, with its shortening of travel times and distances, increased the danger of epidemics turning into pandemics. Although pathways of the cholera pathogen included routes across the Eurasian steppe and Russia into Germany, European authorities focused on the hajj as the catalyst for diffusion of the disease—a super-spreader event. El Tor was meant to be the linchpin in the system of stopping disease from passing through the Suez Canal to Europe.²

Arriving together or separately, Aida and Fatma were two of the approximately 40,000 mostly male pilgrims who would pass through the El Tor camp that year. Once loaded in a special boat, they were pulled by tug to one of three disinfecting stations. There, the two women would have been separated from male traveling companions and placed their goods and clothing in a numbered sack that went into a disinfecting oven for twenty minutes. While waiting, pilgrims undergoing disinfection donned a sterilized *galabiya* and proceeded to special rooms for a hot or cold shower or seawater bath. Once bathed, they would have undergone a physical exam by a woman doctor, who checked their pulse, glands, tongues and, if necessary, their temperature. They then went by foot or train the short distance to the camp, which was secured by a cordon of soldiers surrounding each section and Bedouins at the outposts, and from which there was no escape. Directed to a fenced area two hundred meters by fifty meters that held up to six hundred inhabitants and was separated from the next batch of pilgrims by an empty plot, they were assigned to a tent in the four rows of twenty-five tents in the area, which each slept six. In their fenced-off area, they had access to piped water for washing and drinking, food at the concession stand, and a general provision store.³

¹ Milton Crendiropoulo and Miss B. Sheldon Amos, “On Agglutination of Vibrios,” *Journal of Pathology and Bacteriology* 9 (1904): 261; M. Crendiropoulo and Cornelia B. Sheldon Amos, “Further Observations on the Influence of Calcium Chloride on the Agglutination of Vibrios,” *The Lancet* (22 December 1906): 1722–23.

² Valeska Huber, *Channelling Mobilities: Migration and Globalisation in the Suez Canal Region and Beyond, 1869–1914* (Cambridge, UK: Cambridge University Press, 2013). For background on cholera, see Myron Echenberg, *Africa in the Age of Cholera: A History of Pandemics from 1817 to the Present* (Cambridge, UK: Cambridge University Press, 2011); Frank M. Snowden, *Epidemics and Society: From the Black Death to the Present* (New Haven, CT: Yale University Press, 2019), ch 13; and Sheldon Watts, *Epidemics and History: Disease, Power and Imperialism* (New Haven, CT: Yale University Press, 1997), ch 5.

³ *Al-Ahram* (3 April 1902): 1; John G. Long, “The Quarantine Camp at El Tor,” *Public Health Reports (1896–1970)*, vol. 17, no. 20 (16 May 1902): 1156–59. As US agent and consul-general for the US in Egypt, Long wrote to inform the

Twice a day, Aida and Fatma—like all quarantined pilgrims—would have undergone a health check by the doctor assigned to their unit. Imperial doctors closely observed the two women and others passing through El Tor, for there had been a cholera outbreak in Mecca that year. The water-borne disease moved swiftly through congested areas with poor sanitation. It moved equally swiftly through individual bodies, manifesting in rapid loss of bodily fluids from diarrhea and vomiting; cramping from dehydration; discoloration as the body, lacking oxygen, turned blue; and sunken eyes. It was painful to watch, much more painful to endure. When the two women showed signs of infection, they would have been moved to an isolated tent segregated by sex and then a wooden isolation hut. Aida died on the third day of her illness and was buried in the Sinai, likely in lime with little ceremony. Fatma was more fortunate: having recovered, she would have proceeded on her way home, wherever that was, after fifteen or more days.⁴

Examining the experiences of those struck by the disease and stuck in El Tor alongside the work of scientists in the laboratory illuminates the history of cholera as pathogens hitching a ride through human bodies and bodies of water such as the Suez Canal. It showcases the quarantine station not just as a liminal and melancholic space of waiting, but as a place of experimentation and imperial knowledge production. Yet it also shows the uncertainty of science in confronting infectious disease, even as scientists spoke in a language of certainty. This may all seem familiar or obvious to us now, as veterans of the Covid-19 pandemic, as we process our own experiences and observations. Looking at the history of epidemics, cholera in this case, and attempts to stop it at gateways such as the Suez Canal has a great deal to teach us about gender, disease, space, time, and travel. Women doctors and female pilgrims have often been overlooked in histories of science and quarantine studies. This is an attempt to rethink these histories.

Neither Aida's death nor Fatma's departure from the quarantine station occurred before the female English doctor Bonté Elgood had collected and analyzed samples from the women's "dejecta," confirming the presence of cholera vibrios. An intestinal infection caused by the ingestion of toxic bacteria, cholera passes to other humans through the contamination of food and water by fecal matter. The stools of those suffering from cholera look like rice water and contain mucus and epithelial cells from the infected intestines. At the time of Aida's death, there was little doctors could do to treat infected patients: rehydration protocols had not yet been established, antibiotics had yet to be discovered, and cholera vaccine development was still at an early stage of testing and not in widespread use. The key to prevention was through the provision of uncontaminated food and water, alongside proper sanitation, and the key to containment was through establishing quarantines. However, at the source of the disease, in India, British colonial officials refused to acknowledge widely accepted ideas about cholera contagion and containment through proper sanitation and quarantines, allowing the disease to run rampant, prioritizing trade and the movement of goods over preventing and containing contagion.⁵ Once cholera spread from India, it became a global problem and had to be stopped elsewhere.

Bonté Elgood joined the International Sanitary, Maritime, and Quarantine Board of Egypt as an assistant medical officer in 1900, with her main duties being the inspection of female passengers on ships transiting the Suez Canal and overseeing the quarantine at El Tor of women returning from the hajj, treating those with infectious and other diseases.⁶ She

assistant secretary of state of the cholera outbreak at El Tor, drawing closely from the description of the procedures in *al-Ahram* or a translation of it; the US did not have a representative on the International Sanitary Board. See also Marc Armand Ruffer, "Measures Taken at Tor and Suez against Ships Coming from the Red Sea and the Far East," *The Lancet*, paper read 15 December 1899: 31–35.

⁴ Creniropoulo and Amos, "On Agglutination of Vibrios," 261; Creniropoulo and Amos, "Further Observations"; and Ruffer, "Measures Taken at Tor."

⁵ Sheldon Watts, "From Rapid Change to Stasis: Official Responses to Cholera in British-Ruled India and Egypt: 1860 to c.1921," *Journal of World History* 12, no. 2 (2001): 321–74.

⁶ Wellcome Institute, Private Papers (PP), Elgood (ELG), A2, Maurice Amos's Memoir, 107; PP/ELG/D3.

arrived at the quarantine station just as a new bacteriological laboratory, post-mortem room, and dispensary had been built, establishing the camp at El Tor, in the words of the president of the Quarantine Board, Marc Armand Ruffer, as “an immense field for pathological research.”⁷ Elgood would spend several seasons at El Tor, including 1902, when Aida and Fatma were quarantined, spending the rest of the year at Suez and then Alexandria, where she was transferred in 1903.⁸ It is in Elgood’s scientific articles that we find traces of Aida and Fatma’s journeys. The vibrio cholera she collected from the two were subsequently used in a series of laboratory experiments she undertook with colleagues.

Egypt has long been pivotal in the story of cholera. The epidemic of 1883, one of a number the country faced in the nineteenth century, provided an opportunity for Robert Koch and his German team to identify the cholera bacillus, which they discovered in the intestinal mucosa of dead cholera victims in Alexandria. Koch’s team subsequently confirmed that the micro-organism caused cholera, and was not only a consequence of it, in India, where cholera also ravaged the population. Egypt continued to be a laboratory for European scientists competing to understand, diagnose, treat, and stop the disease’s spread north through the Suez Canal. Elgood, and Aida and Fatma by implication, played a role in identifying a new vibrio, “El Tor,” named after the location where it was first viewed under a microscope.⁹

Although Aida and Fatma’s nationalities were never noted, according to officials at the time, pilgrims stopping at the quarantine station came in two main groups. The first, made up of Algerians, Moroccans, Herzegovinians, Serbians, Bulgarians, and pilgrims from Anatolia, the Caucasus, and Central Asia as far as Mongolia, had visited Medina first and then went to Mecca. The second group, arriving at the station four or five weeks later, came from Egypt, Sudan, and Greater Syria and had visited Mecca first and then went on to Medina. Both groups embarked on their Red Sea journeys home from the ports of Yanbu or Jidda. It is unclear if Aida and Fatma were part of the first or second group, but as with most pilgrims they likely travelled on overcrowded vessels with poor sanitary arrangements, as captains and ship owners transporting pilgrims tried to maximize profits.

While we do not know Fatma’s ultimate destination, it is possible that she landed at Suez and proceeded home with other Egyptian pilgrims. That year, 1902, Egypt witnessed one of its worst cholera outbreaks ever, one which Dr. Naguib Mahfouz (the medical doctor, not the novelist) discussed in his memoirs. Then still a medical student, Mahfouz volunteered to go to the Upper Egyptian village of Musha, where the cholera outbreak was first reported and, in his words, “played havoc with the inhabitants of the village, who died in large numbers.” There he mapped wells and deaths, correlating the two to find the source of the contagion. He ultimately pinpointed its source to a well hidden in a home into which holy water carried back from the hajj by the village mayor had been poured. Mahfouz was subsequently transferred to other sites of disease outbreak at Dakhala, Dayrat, and Minya, as well as a coastal village near Alexandria. Throughout, he worked with Egyptian and colonial medical officers to identify tainted water supplies, disinfect homes, and isolate patients.¹⁰

The epidemic of 1902 hit the poor peasants of Upper Egypt particularly hard. Two decades earlier, in 1880, the country’s water provisioning had been privatized, with the Cairo Water Company—a foreign-owned and managed enterprise—assigned the concession. The company, which was supposed to provide spigots in urban areas throughout Egypt,

⁷ Ruffer, “Measures Taken at Tor,” 31–32.

⁸ Bertrand Russell, *Autobiography of Bertrand Russell, 1872-1914* (Boston: Little, Brown and Company, 1967), 210.

⁹ Claude Chastel, “Le centenaire de la decouverte du vibriion d’El Tor (1905) ou les debuts incertains de la septieme pandemie du cholera,” *Histoire des Sciences Medicales* 41, no. 1 (2007): 72–73; Myron Echenberg, *Africa in the Age of Cholera: A History of Pandemics* (Cambridge, UK: Cambridge University Press, 2011); Ng on Fang, *China and the Cholera Pandemic: Restructuring Society under Mao* (Pittsburgh, PA: University of Pittsburgh Press, 2021).

¹⁰ Naguib Mahfouz, *Hayat Tabib* (1966; repr. Cairo: al-Hay’a al-Misriyya al-`amma li-l-Kitab, 2013), 69–82, 93–106; Naguib Mahfouz, *The Life of an Egyptian Doctor* (Edinburgh: Livingstone, 1966), 38–51, 55–64; quote from 38. The novelist Naguib Mahfouz was named after Dr. Naguib Mahfouz, who was the medical officer who delivered him. See Beth Baron, “Of Fistulas, Sutures, and Silences,” *International Journal of Middle East Studies* 53, no. 1 (2021): 133–37.

concentrated on providing water in the capital, the Delta, and Middle Egypt to wealthier homes and foreign habitations, neglecting the villages of Upper Egypt, which were seen as places of extraction not infrastructural investment. Although Egypt had been under British occupation for two decades when the 1902 epidemic broke, little to no effort had been expended on providing clean water to Upper Egyptian villagers. From the identification of the cholera bacillus and new understandings of contagion and germ theory, it was clear to the international scientific community that cholera was a water-borne disease and the most meaningful way of preventing its spread was to ensure clean water supplies and proper sanitation. Villagers, who depended on water from wells or the Nile, paid the price with their lives, as Mahfouz showed.¹¹ Yet, in earlier and subsequent epidemics, villagers in the north of Egypt were also at the mercy of the disease. The switch from basin to perennial irrigation had been accompanied by the building of a network of canals to water Egypt's cotton fields. These canals became ideal sanctuaries for the cholera bacillus and disease transmission, as peasants used the water, which was often standing and not flowing, for multiple purposes, including drinking, washing clothes, and bathing.

For the international collection of doctors at El Tor, the pilgrims caught in the quarantine net were perfect subjects for medical studies. As Elgood wrote, "During the pilgrim season of 1901, at the Quarantine Station at Tor (Sinai), the writer was much impressed by the prevalence of fatal dysentery among the pilgrims, by the variety of types of the disease present, and by the comparative rarity of amoebic dysentery." She continued, "The post-mortem appearances of the fatal cases were also very varied."¹² As a result of her interest and observations, her boss, Ruffer, an eminent bacteriologist, asked her to review the current literature on dysentery. The product, "A Critical Review of Recent Work on the Etiology and Pathology of Dysentery," was published in *The Journal of Pathology and Bacteriology* in 1902.¹³ Elgood continued her research on dysentery in the hospital at El Tor, summarizing her findings of four years of clinical treatment of patients, all of whom were "Africans, Asiatics, or Turks," at the quarantine camp for *The Lancet*.¹⁴

Elgood built on her work and samples from El Tor at the Port Vieux Laboratory in Alexandria, the Quarantine Board's headquarters. In collaboration with Milton Crendiropoulo, a Greek doctor, she co-authored two articles exploring laboratory methods to quickly identify cholera bacterium through the agglutination of vibrios by adding salts to the serum. In the first paper, they tested thirteen vibrios, twelve from cholera patients and one from sea water. Most of the thirteen vibrios in this study came from cholera patients in Alexandria: three specifically from the Greek Hospital and the rest from El Tor.¹⁵ Elgood and her collaborator's second paper was based on an increased number of samples, looking toward a more general rule for testing to identify the cholera pathogen. Most of the seventeen samples in the second study were blinded with names and numbers. In addition to the 1 through 6 vibrios from El Tor, there were vibrios from Berlin: 70, 76, and 115.¹⁶ We know Aida and Fatma's identities, or at least their first names, because theirs were

¹¹ Zeinab Abul-Magd, *Imagined Empires: A History of Revolt in Egypt* (Berkeley, CA: University of California Press, 2013), 137–39; Zeinab Abul-Magd, "Rebellion in the Time of Cholera: Failed Empire, Unfinished Nation in Egypt, 1840–1920," *Journal of World History* 21, no.4 (2010): 691–719.

¹² Miss Sheldon Amos, "A Critical Review of Recent Work on the Etiology and Pathology of Dysentery," *The Journal of Pathology and Bacteriology* (September 1902): 366.

¹³ *Ibid.*, 366–67.

¹⁴ C.B. Sheldon Amos, "A Note on the Treatment of Catarrhal and Gangrenous Dysentery," *The Lancet*, 4 August 1906: 295–96.

¹⁵ Crendiropoulo and Amos, "On Agglutination of Vibrios." In their first paper, published in the *Journal of Pathology and Bacteriology*, Elgood and Crendiropoulo looked at the action of various salts on cholera vibrios isolated from patients such as Aida and Fatma, concluding, among other things, that several groups of vibrios are found in cholera patients and while some salts cause agglutination, others do not, but agglutination cannot occur in the absence of salt.

¹⁶ Crendiropoulo and Amos, "Further Observations."

among the few vibrios not blinded and named after patients, not towns or cities, revealing the bodies behind the science.

The two scientists worked to find better ways to identify cholera at a time when colleagues at El Tor were puzzling over the problem of classification. Already in 1897, doctors examining samples were surprised by some vibrios they encountered; ones resembling cholera but with distinct differences. In 1905, Dr. Felix Gotschlich, a physician at the El Tor quarantine station, published a paper on this research, identifying vibrios that closely resembled cholera in the stool specimen of two pilgrims returning from Mecca. Because these vibrios were hemolytic—causing damage to red blood cells—which it was thought cholera was not, and since there was not a cholera outbreak at the quarantine station or in Mecca at the time, Gotschlich did not identify the vibrio as cholera. Elgood and her colleague agreed with Gotschlich, who had provided the El Tor vibrios for their study, that these vibrios were distinct from classic cholera; a finding they published in their second article, which appeared in *The Lancet*.¹⁷

Elgood had initially come to Egypt to work in Suez and El Tor, benefiting from the imperial need for women doctors to inspect female Muslim passengers on ships and in the quarantine station. After working with the Quarantine Board for six years, she moved to Cairo to become the medical inspector for girls' schools. Like many imperial doctors, she took an interest in producing scientific knowledge in order to advance medicine, enhance her standing in the field, and sate her curiosity. Studying quarantine patients—and later students—as subjects, she produced a steady stream of articles, but faced limits to advancing up the colonial medical hierarchy as a “lady doctress.” Elgood retired in 1922 but remained in Egypt as part of the diminishing British colony; in 1956, however, she was forced out during the Suez crisis and returned to England, where she died in 1960. She did not live to see the cholera epidemic connected to the El Tor vibrio in Sulawesi, Indonesia, in 1961. Endemic in Indonesia from the 1930s, the vibrio subsequently spread to China, Hong Kong, Manila, the Philippines, and eventually Africa and Latin America in the seventh pandemic, also known as El Tor cholera.¹⁸

At the turn of the century, some of the Muslim pilgrims headed toward the Suez Canal who transited through the quarantine station at El Tor and proceeded through had extra baggage. The El Tor vibrio carried in their bowels from Mecca was different from previous iterations of the bacteria. It had a lower fatality rate than the vibrios that caused the first six pandemics, but was much more contagious; and, as many of the carriers showed no symptoms, quarantine proved ineffective. We do not know the names of the earliest carriers of this new cholera variant, only that it was present in the stool of ship passengers who stopped in El Tor. Unlike Aida and Fatma's vibrios, the El Tor vibrio was named after a place, not people. This is not to say that the disease originated in El Tor. Rather, the imperial scientists presiding over the laboratories at the station and its headquarters saw the pathogen through their microscopes and, with their authority to name, chose the name of the place. This naming stigmatized El Tor in the annals of medical history, reinforcing the idea of cholera as an “Asiatic” disease and, at the same time, obscuring British colonial officials' role in India and elsewhere in facilitating the spread of the disease.

In fact, it is likely the pilgrims carrying the pathogen that later erupted into the seventh pandemic did not even stop at El Tor, but rather took another path to Southeast Asia, where the new cholera iteration waited over half a century to spread beyond the island. Southeast Asians returning from Mecca would have headed south, around the Arabian Peninsula, into the Indian Ocean, and home. They had faced quarantine on their way to the hajj, when they were stopped, after long sea voyages, by Ottoman or colonial authorities at Kamaran—a tiny,

¹⁷ Ibid.; F. Gotschlich, *Vibrions Cholériques isolés au campement de Tor. Retour du pèlerinage de l'année 1905. Rapport adressé au président du Conseil quarantenaire d'Égypte*, 1 brochure de 10 p., Alexandrie, 1905 in *Bulletin de l'Institut Pasteur* (1905): 726–27.

¹⁸ Claude Chastel, “Le centenaire de la découverte du vibron d'El Tor”; Echenberg, *Africa in the Time of Cholera*.

barren island off the coast of Yemen—for ten to fifteen days. Kamaran was the largest quarantine station established by sanitary authorities in the Red Sea, and—like El Tor—had bacteriological laboratories, basic accommodations, and grave sites. It is unclear whether pilgrims stopped on their return as well.¹⁹

Microbes moved through bodies, bodies moved on ships, and ships moved up the Gulf of Suez, heading toward the Suez Canal. These multiple passages and passengers, as microbes hitched their fates to intestines and hijacked bodies, proved illuminating and illusive to scientists and patients alike. Aida, Fatma, and Bonté Elgood's paths intersected in a particular place—El Tor—at a specific moment in time. The English scientist benefited from the pilgrims' travails but also worked to understand a disease that proved deadly to patients and sometimes scientists and doctors. Aida and Fatma may not have directly benefited from the science their bodies helped produce; they would have benefited from colonial projects that protected colonized people's food and water.

¹⁹ Eric Tagliacozzo, "Hajj in the Time of Cholera," in *Global Muslims in the Age of Steam and Print*, eds. James Gelvin and Nile Green (Los Angeles: University of California Press, 2013), 103–20; Personal email communication from Eric Tagliacozzo, 5 May 2022.