

Reflections on Malaria in Jerusalem

Vicken V. Kalbian



Figure 1: Dr. Vahan Kalbian, from the family collection of the author.

Malaria shaped and influenced the history of Jerusalem and Palestine in the early twentieth century, in ordinary times, during World War I, and under British administration. The Ottomans only employed token efforts to control this widespread disease. The only serious attempts to control malaria in the region were in northern Palestine, where Jewish settlers initiated the elimination of mosquito breeding sites by simply draining the swamps in and around their settlements.¹ For many Jerusalemites, my family included, malaria, aggravated by the arrival of Spanish flu in 1918 and 1919, continued to be an enemy to be battled well into the British Mandate period.

My father, Dr. Vahan Kalbian (1887–1970) was the chief medical officer of the Ottoman military hospital in the Russian compound in Jerusalem during the closing months of Ottoman administration (see figure 1). Years later, when I was a young man, he shared with me the story of an auspicious incident that occurred under his watch – one that would have long-term political consequences for Palestine.

According to my father, in the late summer of 1917, a distinguished gentleman tried to arrange a meeting with my father. My father refused: as a high-ranking Armenian officer in the Ottoman army, surrounded by several junior Turkish officers, he followed the anti-corruption regulations imposed by Jamal Pasha rigorously, and a golden rule was that under no circumstance should a medical officer be perceived to show favoritism by receiving civilian visitors at his offices. After the gentleman tried repeatedly to see my father with no success, the acting Armenian Patriarch of Jerusalem, Malachia Ormanian, intervened.² The patriarch asked my father to call on him at the Armenian

convent and told him that the person who was attempting to visit my father was Raghib al-Nashashibi, a member of parliament and the city engineer, who had been very helpful to the Armenian community. Coaxed by the patriarch, father agreed to see Mr. Nashashibi.

After some small talk, a cup of coffee, and a cigarette, Mr. Nashashibi asked my father if he would kindly release one of the inpatients at the Russian hospital on a three-month medical leave. My father categorically refused to engage in fraud to grant such a favor and Mr. Nashashibi left disappointed and irate. The next day, my father cautiously walked up to the ward to check the patient in question. The young officer appeared healthy. Nevertheless, my father examined him and found that the young man had an enlarged spleen, which by the medical criteria of that time was bona fide evidence of chronic malaria. Moreover, a urine test was positive for urobilinogen, which further confirmed the presence of malaria.³ Based on this diagnosis, my father implemented the army medical manual instructions and discharged the young officer to benefit from three months convalescent home leave, able to grant Nashashibi his wish after all without engaging in fraud or deception. A few days later, the British launched their major offensive on the Gaza–Beersheba front. In response, Jamal Pasha, commander of the Ottoman Fourth Army, ordered all hospitalized soldiers who were ambulant to the front in order to bolster the number of troops already there. Had Nashashibi’s friend still been an inpatient, he most certainly would have been sent to the front and likely would not have come back, as very few Ottoman troops returned from that deadly British assault.

The young man with the enlarged spleen, it turns out, was none other than Hajj Amin al-Husayni, whose life, in all probability, was “saved” by his close friend Raghib al-Nashashibi’s timely intervention. There is no mention of this incident in biographies of Hajj Amin’s.⁴ However, one biographer, Taysir Jbara recounts an earlier incident that suggests that this was not the first time that Hajj Amin had “evaded” active service. Hajj Amin had been trained as an officer at the Istanbul military college but his army experience was minimal. According to Jbara, he detested “sleeping in cold barracks riddled with bed bugs.” After serving three months as an officer in Izmir, Hajj Amin became “sick” and was hospitalized. There he became friends with another officer from Jerusalem, Yusif al-Munir (presumably a doctor). Munir succeeded in getting Hajj Amin permission to leave Izmir for medical reasons, and he arrived home in Jerusalem in late February 1917 to recuperate for three months. Later, the Husaynis amply compensated the Munir family for that favor.⁵

A decade later these two close friends, Hajj Amin al-Husayni and Raghib al-Nashashibi, who could have posed a united front against the Zionist threat, became embittered opponents. Hajj Amin rose to become mufti of Jerusalem and the leader of the resistance movement against the British and the Zionists, while Raghib Bey, as the appointed mayor of Jerusalem, led the reconciliatory moderate elements (see figure 2). Meanwhile, my father and Raghib al-Nashashibi became lifelong friends. As I grew up, he was ‘ammo (uncle) Raghib in our home. Sadly, in 1951 my father and I took care of him at the Augusta Victoria Hospital in his final days, where he died of pancreatic cancer.

My father’s story of diagnosing malaria in the young Amin al-Husayni has always intrigued me, and it led me to delve more deeply into the prevalence of malaria in



Figure 2: Raghib al-Nashashibi (left) and Hajj Amin al-Husayni (right) as members of the Arab Higher Committee in 1936, from the collection of the Library of Congress.

Jerusalem during that era. History is replete with examples of how malaria has shaped events globally: “It was justly feared as it had been a threat to the human race from time immemorial and had been responsible for calamities as great as the destruction of empires and various military disasters throughout history.”⁶ Jerusalem in the World War I period was no exception. After consulting various sources and relying on memories and personal accounts of my parents, I realized that historians might benefit from a more careful study of the “historic” role malaria played in the area’s tumultuous history. In this paper I will briefly describe malaria, its prevalence in Jerusalem, and the role it played in the early part of the twentieth century based on narratives from my parents who lived there, as well as on my own unpublished reminiscences. I will depict how residents of Jerusalem came to terms with malaria and mosquitoes in their daily life. Finally,

I will refer to the Spanish Flu that battered Jerusalem in the closing days of World War I as it spread north through the Middle East. For those readers who are not familiar with the disease, let me begin by offering a brief medical overview.

Malaria

Malaria is a chronic debilitating disease with a significant morbidity and mortality in its severe form (*P. falciparum*).⁷ It is an ancient disease, depicted as early as 2,700 BCE and prevalent in ancient Rome, where it was linked with marshes in areas close to human habitation, hence the disease acquired its name “mal aria” (bad air). Treatments for malaria also have a long history, extending back two millennia in China. In the sixteenth century, Jesuit missionaries learned of the curative power of a native Peruvian tree bark that grew naturally on the eastern slopes of the Andes from Columbia to Bolivia.⁸ In 1820, a Frenchman isolated the active ingredient and named it quinine. Throughout the nineteenth and the early twentieth centuries, quinine was the only available drug worldwide for the prevention and cure of malaria, but was fully dependent on the supply of the bark. Ironically, it took the threat of war to bring about the development of a life-saving drug. As the clouds of war loomed over Europe for the second time in the first half of the twentieth century, leaders on both sides were aware of the heavy toll that malaria would

take in a war. The main source of the quinine bark at the time was the island of Java, a colony of the Netherlands, a country unfriendly to the Germans. It became imperative for Germany to find a synthetic substitute. This led to the manufacture of the antimalarial drugs Atabrine, developed by the German firm IG Farben in the 1930s, and Chloroquine, developed a few years later by the German firm Bayer. Both drugs were mainstays in the prevention and treatment of malaria during World War II, when it was a major health problem in North Africa, Italy, East Africa, the Middle East, and the Pacific front.

Concurrent with the efforts to develop effective treatments, were the attempts to isolate the cause of the malaria. In 1880, Charles Laveran, a Frenchman in Algeria, isolated a parasite in the blood smears of afflicted patients. Then in 1897, Ronald Ross, discovered that the parasite was transmitted to humans through a mosquito bite, specifically the bite of the female Anopheline. This set the path to the full unraveling of the complex life cycle of the parasite, which uses both the human body and the mosquito as hosts.

Cisterns of Jerusalem

The mosquitoes that carry malaria need water, plant and fruit nectar, and blood to survive. Fruit and plant nectar is their primary source of food, while females of the species need human blood not for nutrition but for the reproductive cycle, as the protein in blood is essential for the development of their eggs. Water, especially stagnant water, is required for mosquitoes to breed for mosquito larvae to mature. In the absence of water, mosquitoes cannot thrive. Situated at 2,500 feet above sea level, with moderate winter rains and no proximate marshes or lakes, Jerusalem should ostensibly have been free of malaria.

For Jerusalemites, water was not only life-sustaining, but essential for personal hygiene and indispensable for religious ablution.⁹ Jerusalem's first inhabitants settled at the foot of biblical Mt. Ophel near a source of dependable year-round running water, the springs of Silwan ('Ayn Umm al-Daraj and Bi'r Ayyub).¹⁰ Over the centuries as the city's population grew and it extended west and north, water supplies became scarcer. Thus other sources of water had to be developed. Remains of Jerusalem's historic water supply and storage systems are still visible, from the large pools carved from the rock to the aqueducts built by the Romans to bring water from Artas, seven miles south of the city, to the bathhouses and large communal cisterns.¹¹ Winter rainwater was collected through gutters into underground cisterns found almost under every house. In the Old City, neighborhoods shared communal wells and citizens relied on municipal fountains and pools.¹² As two nineteenth-century visitors to Jerusalem noted,

The ancient supply [of water] appears to have been obtained from springs, wells, the collection of rain in pools and cisterns, and water brought from a distance by aqueducts. The extensive remains of cisterns, pools and aqueducts show that little dependence was placed on any natural springs existing in or near the city.¹³

Many cisterns in Jerusalem were quite ancient such as the ones attached to the Coptic convent east of the Holy Sepulchre and those underneath the Latin Convent and the Church of the Flagellation.¹⁴

Under Ottoman rule, permits for building houses outside of the city walls were conditional on the construction of a cistern, a practice that continued under the British Mandate. The proliferation of cisterns, especially outside the Old City, provided the *Anopheles* mosquitoes with breeding locations. Ottoman Jerusalem also had at least two open-air harvesting pools: Birkat Mamilla, which was connected to the pool of Hezekiah in the Christian Quarter, and Birkat Sultan. These pools, which in addition to the Silwan springs provided an important water source for citizens of Jerusalem, were also natural breeding sites for mosquitoes. However, although malaria was justifiably associated with water in cisterns, before the twentieth century the association of mosquitoes and malaria was not fully realized.¹⁵

In 1901, the water from Solomon's Pools just south of Bethlehem was reconnected to the abandoned Birkat Sultan by a pipeline, with an extension via an ancient Roman aqueduct to the giant cisterns under the Haram al-Sharif.¹⁶ Still, no thought was given to its public health consequences as a major breeding site for mosquitoes. In 1903, Masterman, after examining several sites for *Anopheles* in and around Jerusalem, found larvae in the open Birkat Mamilla.¹⁷ On the positive side, affordable water was now readily available to the residents of the city, carried in goatskin bladders and tins by porters (*hammal*) or on donkeys from the pool and the many fountains inside the Old City. After the 1908 Ottoman reforms, serious plans were made to bring running water to the city, but these were not implemented at that time.¹⁸

Public Health in Jerusalem

Most visitors to Ottoman Jerusalem agreed that it was not a very healthy place to live. They referred to the rampant poverty, squalor, and lack of basic municipal services such as garbage collection.¹⁹ Mark Twain, one famous visitor to the Holy Land, wrote, "To see the numbers of maimed, malformed and diseased humanity that throng the holy places and obstruct the gates, one might suppose that the ancient days had come again, and that the angel of the Lord was expected to descend at any moment to stir the waters of Bethesda. Jerusalem is mournful, and dreary, and lifeless."²⁰ Besides malaria, citizens of Jerusalem experienced other common diseases such as typhoid, typhus, cholera, dysentery, and trachoma (the main cause of premature blindness), all of which could be attributed to lack of basic public health services under the Ottomans. For example, in 1914, life expectancy in Palestine was 30 year for males and 32 years for females, with an infant mortality rate of 290 per 1,000 (recent comparable figures are 70 and 74 years for life expectancy of males and females, respectively, and 21 per 1,000 for infant mortality).²¹

Malaria's prevalence in Jerusalem could explain the stunted growth of Jerusalem's population in the eighteenth and nineteenth centuries (see figure 3), at a time when the infusion of European capital and the construction of churches, schools, and hospitals

should have led to a growth in the population, especially as many important cities in the region were growing.²²

Year	Jewish Population	Muslim Population	Christian Population	Total
1838	3,000	4,500	3,500	11,500
1844	7,120	5,000	3,390	15,510
1846	7,515	6,100	3,558	17,173
1851	5,580	12,286	7,488	25,354
1853	8,000	4,000	3,490	15,490
1856	5,700	10,300	3,000	18,000
1862	8,000	6,000	3,800	17,800
1864	8,000	4,500	2,500	15,000
1866	8,000	4,000	4,000	16,000
1867	—	—	—	14,000
1869	7,977	7,500	5,373	20,850
1871	4,000	13,000	7,000	20,560

Figure 3: Population trends in Jerusalem in the second half of the nineteenth century.²³

Estimates of malaria incidence in the nineteenth century were either based on symptoms (recurrent chills and fever) or on spleen size, which invariably enlarges in response to malaria, getting progressively bigger with each attack. It was only at the turn of the twentieth century that the parasite could be identified by microscopic examination of a blood smear.²⁴ Its prevalence over the years was noted to be directly related to the winter rainfall with the severe epidemics ensuing after the heavier rainfalls. In the summer of 1880, following an exceptionally wet winter, malaria, “which spares no age and attacks both sexes,” was so severe that “only a few of the inhabitants escaped.”²⁵

The British physicians John Cropper and Ernest Masterson and the Jewish doctor Israel Klinger compiled detailed information about malaria’s patterns of distribution in Palestine in the late nineteenth and early twentieth centuries.²⁶ Cropper, who lived and worked in Jerusalem and Ramallah, wrote in 1905 that nearly one-half of the population suffered of malaria and the disease was more common in children than in adults. He wrote that “the mosquitoes during daytime will select the coolest, darkest and dampest spot available, especially avoiding well lighted whitewashed rooms: they may always be found by day in the cisterns.”²⁷ He also noted that in a few areas where there were no cisterns, malaria was not found. According to the *New York Times* in 1913, “in Jerusalem every fifth person had malarial germs in their blood and every third person had an enlarged spleen.”²⁸ According to Dr. L. Puchovsky, malaria in Palestine was so rampant that it was hard to find anyone who had not suffered from it, and having suffered from it amounted to a “certificate of citizenship.”²⁹

Accounts focused on public health and medicine often missed the human dimensions of malaria’s toll on Jerusalemites, however. Spanish Consul Ballobar, who kept a diary, was himself a victim of malaria. He described how malaria offset all the advantages of

the pleasant May to December season, making “a mess of his appetite, stomach, head and nerves.” With the arrival of the British, he called for a sanitary campaign against trachoma and malaria, “the two calamities of this country,” and suggested “spraying petroleum over marshy areas, draining the swamps and finishing off the mosquitoes.”³⁰

Yet many memoirs describing life in Jerusalem preceding and during World War I make almost no reference to malaria or any other public health problem: the Palestinian diarist Ihsan Hasan Turjman does not mention it and Sami Hadawi mentions it “en passant.”³¹ Their overlooking the topic of malaria is somewhat mystifying and suggests that it may have been so common (as common as measles, for instance) that they did not think it deserved mention. Epidemics were not infrequent and a severe cholera epidemic had hit in 1916 soon after the havoc caused by the unwelcome visit of dreaded locusts.³² As an example of the state of public health at the time, Hadawi described the Ottomans’ primitive efforts to eradicate lice, a common transmitter of contagious diseases during World War I.

The congestion of troops in the city created health and other hazards for the inhabitants, lice became a problem, while epidemics of typhoid, typhus, malaria, and dysentery spread like wildfire. To combat the spread of lice and disease among the troops, the army established fumigation centers in certain parts of the city and one of these was located in our church compound at the entrance of the school. Soldiers would be lined up naked while their clothes were being processed through the fumigation machine and then allowed to dry. The odor and the dirt surrounding the operation were terrible. No precautions were taken by the army to take into account the presence of ladies living in the buildings overlooking the compound the headmaster did his best to protect his students from the spread of lice and their resulting diseases.³³

Coping with Malaria and Mosquitoes

For residents of Jerusalem in the late nineteenth and early twentieth century, knowledge about and treatments for malaria were scant. Nevertheless, they understood the powerful toll the disease could take on their families. Andrew Breen, an American Catholic priest, described the use of non-medical therapies, such as a red-hot ramrod being placed over the enlarged spleen, in the early twentieth century.³⁴ The dispensary of the Franciscan monastery in Jerusalem had quinine on its formulary as early as the seventeenth century.³⁵ In the late nineteenth and early twentieth centuries, “there used to be a bottle of quinine on every dinner table next to the oil, vinegar, salt and pepper.”³⁶ There was the well-publicized quinine pill, which because of its effectiveness to cure the chills and fever of malaria, was in global use. It was cheap and easily available under the Ottomans, manufactured mostly in Europe from the bark harvested and shipped from Peru and Java. In Jerusalem, it was also used for all kinds of fevers, such as typhoid and typhus.

Overdosing was not uncommon, as in the case of a Jewish physician who developed facial palsy as a result.³⁷ My mother, who was born in Jerusalem in 1888, did not seem to have been too concerned but she, her father, and her aunt took their quinine pill daily “as a matter of fact.” My mother-in-law, Marie Nicodeme, born in 1899, was not as fortunate; she contracted malaria in Jerusalem in 1910 and had to convalesce in Jaffa.

The Ottomans did not have any sort of public health program and created the ministry of health under German coercion only in 1914 at the beginning of the war. The Ottoman ministry of health implemented legal regulations and imported quinine from Germany and distributed it free of charge to the public. The newly built Augusta Victoria Stiftung on the Mount of Olives was used as a “malarial convalescent home.”³⁸ Meanwhile, efforts to break the mosquito-human cycle were later to develop – in part because the role of the mosquito in the spread of malaria was only established at the very end of the nineteenth century. It was only in 1911 that early Jewish settlers along the coast north of Jaffa and in the Galilee, where malaria was rampant, started to implement basic mosquito eradication tactics by draining wetlands.³⁹ Other, even more basic measures included getting rid of the mosquito manually. This was not an easy task. They were swatted to death on site, leaving a bloody stain on the whitewashed bedroom walls, a frequent sight as I grew up. The simplest preventive measure was sleeping under a mosquito net (mosquitoes usually bite between 10 pm and 2 am). It is said the Cleopatra slept under a net and netting had also been used in India during medieval times, but it became popular in the mid-eighteenth century and was used during the malaria-plagued construction of the Suez Canal.⁴⁰ Netting was easy to place on a child’s cot but cumbersome on an adult bed or the more commonly used mattress on the floor. Window screens, which were invented in the United States in the 1830s, were not in use in Jerusalem until the mid-1930s.

However, despite the intensification of efforts to reduce and prevent malaria prior to the outbreak of World War I, its impact on Jerusalem, Palestine, and war zones the world over was significant. As Bernard J. Brabin writes:

Malaria in the First World War was an unexpected adversary. In 1914, the scientific community had access to new knowledge on transmission of malaria parasites and their control, but the military were unprepared, and underestimated the nature, magnitude and dispersion of this enemy.⁴¹

Malaria and War in Palestine

With the exception of World War I, the deadliest war in history, wartime deaths caused by diseases outnumber those from battle.⁴² Of the 17 million killed during World War I, 10 million were military casualties while 7 million were civilians. Overall there were 2 million deaths from infectious diseases – cholera, dysentery, plague, smallpox, typhoid, typhus, and malaria.⁴³ This could be ascribed to the hasty conscription of millions of troops who were then moved to war zones, often to locations where endemic diseases and unsanitary conditions prevailed. Soldiers carried domestic contagious diseases with

them and were exposed to new ones. Between 1915 and 1918, for example, laborers in the Egyptian Labor Corps brought schistosomiasis and hookworm to Palestine, leading to bouts of infestation.⁴⁴ At the same time, endogenous malaria became the challenge to the invading British army and the main cause of their military deaths.⁴⁵

From late 1914 until mid-1915, the British army in Egypt stood on the defensive guarding the Suez Canal against failed Turkish attempts to cross the canal. They built a railway and supply roads in the Sinai, along the coastal plain in preparation to provide for a larger force advancing into Palestine. Finally, in August 1916, the British took the offensive. In planning for the campaign, their command through its “malaria intelligence units,” was fully aware of the potential consequences of mass exposure to the disease.⁴⁶ It was the principal medical dilemma of the planned campaign as its ferocity was well known. The available literature had focused on its incidence in Jerusalem and the coastal plain north of Jaffa.⁴⁷ Little had been published about its scope in southern Palestine, the Jordan Valley, and Syria. General Allenby had read all the available literature on the topic, from the latest medical publications to Crusader accounts.⁴⁸

Though malaria has been an invisible enemy in many military expeditions, during World War I in Palestine it was used for the first time as a “secret weapon.” In the second half of his campaign in northern Palestine in 1918, Allenby, disregarding experts’ advice, deliberately moved at the start of the malaria season, from the Jordan Valley heading north to Syria. He was fully aware of the consequences, seeking to lay a trap by drawing the enemy to the highly malarial areas, knowing that his troops, greatly outnumbered but outfitted with all the modern means of combating the disease, would have an advantage over the Ottomans, who had no noteworthy anti-malarial strategies.⁴⁹ As Robert Bwire writes:

It had finally dawned on military strategic planners that a well coordinated and militarily successful campaign demanded a mastery of diseases of operational importance. Malaria fitted well into this category. A numerically inferior force with excellent disease control can clobber a larger army.⁵⁰

The strategy was half-successful: the Ottoman army suffered heavily as it advanced into malaria-endemic areas to repel the British advance. The incidence of malaria was 60 percent among German and Ottoman prisoners of war.⁵¹ Of an estimated 771,844 military casualties in the Ottoman army, 466,759 died of illness and 68,378 from battle wounds.⁵² British troops, meanwhile, were issued prophylactic quinine tablets (though soldiers were not uniformly compliant because of the bitter taste of the pill) and modern anti-mosquito equipment (mosquito-proof huts, bed nets, veils, repellent cream, and gloves). Egyptian laborers working under the Egyptian Expeditionary Force drained marshes near the British military camps to reduce the mosquito population. Despite all these measures, malaria struck hard and resolutely, spreading among British troops soon after they moved into malaria-endemic areas in early 1917, after the fall of Gaza.

The field commanders who had planned the advance into Palestine had overlooked two key factors. First, the army moved on horses which needed water to survive, so the

cavalry had to encamp near a source of water such as pools and marshes which were natural mosquito breeding sites; and, secondly the troops moved directly into the deadly malarial Jordan valley rather than circumventing it. In addition, Indian troops, who made up the greater part of the army, carried their own malaria into the Sinai and southern Palestine acting as the unwanted reservoirs of the parasite.⁵³ Malaria remained the major source of mortality through the duration of the war and heightened as the British advanced into north Palestine, Syria, and Lebanon. In mid-October 1918, some 1,200 British soldiers came down with malaria each week. By November 1918, over 6,000 allied troops were hospitalized with severe malaria.⁵⁴ By the end of 1918, nearly 20,000 cases were recorded amongst British troops in Palestine.⁵⁵ Mortality from malaria was low (around 5 percent), but it debilitated patients who then had to be evacuated. During the two months of the offensive, nearly half of the 40,000 troops involved had to be evacuated to Egypt. A total of 773 British soldiers died from malaria, which far outnumbered the fatalities from combat by a ratio of 37 to 1.⁵⁶

Taking into consideration Allied and Ottoman military, as well as civilian, casualties, the conquest of Jerusalem cost thousands of lives, many of whom were victims of malaria. By the end of World War I, malaria was referred to as “the scourge of the Holy Land.”⁵⁷

The Spanish Flu

The triumphant entry of General Allenby into Jerusalem through the Jaffa Gate heralded an era of security and hope for the beleaguered inhabitants of Jerusalem. Many young couples who had postponed their weddings because of the war rushed to get married and, as a result, there was a significant number of newborn babies in 1918 and 1919. Many of these were to become the innocent victims of the approaching deadly Spanish flu pandemic, which reached Jerusalem in September 1918.⁵⁸

The epidemic had started in the United States in the spring of 1918 and was brought across the Atlantic by American troops landing in France. British troops travelling by ships brought it from Western Europe to Alexandria in Egypt and from there on to Jaffa. Jaffa was, at that time, the disembarkation point for the British army as they were reinforcing the exhausted front lines in northern Palestine and Syria who were besieged by the malaria epidemic. For both the military and the civilian population, the flu was now an added burden. The combination of malaria and Spanish flu had a synergistic effect in both Allied and Ottoman armies in Syria, with equally disastrous results and significant mortality among combatants.⁵⁹ Illness from the flu was very short, with high fever and complicating pneumonia sometimes followed by sudden death: the mortality rate of flu sufferers was around 2.5 percent, highest among infants and the elderly.⁶⁰

Local Jerusalem diarists do not mention the flu – Turjman died before its arrival in Palestine and neither Hadawi nor Wasif Jawhariyyeh⁶¹ make reference to it – but the observant Spanish Consul Comte de Ballobar wrote that the Spanish flu was in the region as of 15 September 1918.⁶² He described “many cases of pneumonia” and observed that the combination of the flu and malaria was fatal. Many of the first-born children

of the couples married post-war succumbed to it.⁶³ As late as 6 November 1918 Comte de Ballobar described the death of an elderly lady from the flu as well as the tragic death of a twenty-year-old girl who died from the ensuing hyperthermia of 43 degrees centigrade.⁶⁴ There was no treatment available at the time and supportive care was all that could be offered.⁶⁵

My father, who after years of military medicine, had gone into private practice after the war, now found himself taking care of infants and adults with the flu, with no available effective treatment.⁶⁶ One unusual aspect of the 1918 flu was that it struck down many previously healthy young people – a group normally resistant to this type of infectious illness – including a number of World War I servicemen.⁶⁷ The epidemic finally ended in the summer of 1919. Fortunately, my parents had waited until January 1920 – well after the flu epidemic had dissipated – to get married.

The Persistence of Malaria in Palestine

After 1918, when Palestine fell under British rule, quinine for prophylactic use became available for sale to the public at all post offices in Palestine; in villages, quinine was distributed by the health department free of charge. Soon after their arrival, the British administration applied the most effective and cheapest way of controlling malaria – a heavy oil was poured into every existing cistern in Jerusalem on a monthly basis by the public health department.⁶⁸ Uniformed workers would make the rounds to every house and pour enough oil to cover the water surface in every cistern – a highly effective way of killing the larvae by asphyxiation (they were unable to breathe through the layer of oil). The larger public cisterns were also treated.

Fast growing Australian Eucalyptus trees were planted in every yard by the municipality in order to absorb water off of cesspools (septic tanks that were not sealed at the bottom). These trees became ubiquitous in Jerusalem gardens. A commercially available insecticide was pumped out of a handheld dispenser known as the “flit.” A treated room would then be sealed for the rest of the day, and the pungent smell of the chemical would last through the night. By the 1940s, DDT had arrived which strengthened efforts to eliminate malaria from Jerusalem and most of Palestine.⁶⁹

The end result of these combined efforts was the disappearance of the *Anopheles* mosquito. A family such as my mother’s that stringently practiced these preventive measures remained free of malaria. I do not remember seeing quinine on the dining table in my childhood. I was born in 1925, and by then public health efforts to eradicate malaria from Jerusalem had been successful. Mosquitoes were still around, and as a child I slept under netting, but the vicious, malaria-carrying *Anopheles* mosquito had vanished.

It was war that once again brought the scourge of malaria back to Jerusalem – this time in 1948. After the 1949 Jordan-Israeli armistice, the Augusta Victoria Stiftung on the Mount of Olives in Jerusalem was converted to a hospital by the combined efforts of UNRWA and the Lutheran World Federation. The large halls and rooms, as well

as pre-existing barracks built by the British army, were converted to hospital wards. It became the largest hospital in Jordan, with over 300 beds serving the Palestinian refugees in the West Bank. I was asked to join the staff by Dr. Tawfiq Canaan, the medical director and head of the infectious diseases section at the Augusta Victoria Hospital (AVH). At that time, I was working at the hospital of the American University in Beirut (AUB), but decided to accept the offer in July 1950 and return to my hometown to join my father. My father, who had left Palestine in 1948, had recently returned to be in charge of the Internal Medicine Section at AVH. His return was spurred by the radio appeals broadcast by the Jerusalem Arab Medical Society. The AVH was fully operational under Dr. Canaan, with Dr. Hasib Bulos as the chief of surgery, Dr. Amin Majaj head of the children's department, Dr. Assad Bishara in charge of obstetrics and gynecology, Dr. Raafat Fares director of the tuberculosis section, and Dr. Mohammad Husseini head of radiology. Interns and students from medical schools in Cairo and Beirut joined us to train.

We treated malaria patients at AVH. As malaria is not a contagious disease, patients were admitted to the general medical wards. I had not seen any cases of malaria in my training at the AUB hospital, although I had seen cases in a Palestinian refugee camp in 'Anjar in the Biqa' Valley of Lebanon, where I worked for the International Red Cross in 1949. My impression was that by 1948 the British administration had eradicated malaria in Palestine, but this was not the case, as it was rampant in the refugee camps across the West Bank and the Jordan Valley in the 1950s. Both UNRWA and the Jordanian administration were swift in implementing preventive public health measures. Fortunately, the two forms of malaria – *P. vivax* and *P. falciparum* – common to these outbreaks were curable with available anti-malarial drugs. We were also the first to use a new drug, Camoquin, which cured malaria with a single orally administered dose.⁷⁰

This broad experience in malaria led me to postgraduate studies in Tropical Medicine and Hygiene at the University of London in 1952–1953. Thus, even though much of the history that I have described transpired before my professional career began, malaria shaped my early experiences in medical practice. My father's experience as young Ottoman physician inadvertently propelled him into a situation involving men, Hajj Amin al-Husayni and Raghib al-Nashashibi, who would become two of the most prominent Palestinian leaders. Forty years later, my own career brought me back to Jerusalem to work with my father in a new political and medical landscape. In the intervening years, public health had made great strides, and diseases such as malaria had been brought under control. Nevertheless, I continued to encounter malaria in my practice in Jerusalem. At the time, I knew little about the history of malaria's presence in Palestine. I had tucked my father's anecdote involving Hajj Amin al-Husayni away, and thought of it through these years as an amusing and remarkable tale. Here I have been able to revisit this story in a larger context and with a greater appreciation for the impact of malaria on the history of Jerusalem, particularly during World War I, when General Allenby sought to use it as a "secret weapon," and on the lives of those Jerusalemites it took as well as those it spared.

Vicken V. Kalbian, born in Jerusalem in 1925, is a graduate of the American University of Beirut Medical School. He was on the staff of the Augusta Victoria Hospital in Jerusalem from 1950 to 1968, where he was chief of medicine from 1962 to 1968. He immigrated to the United States in 1968 and had a successful private practice in Winchester, VA. Now retired, he resides in Winchester and pursues his passionate interest in the history of Palestine.

Endnotes

- 1 For a comprehensive study of the exploitation of malaria control and its important geopolitical role during the British mandate, especially in relation to the Zionist project, see Sandra Sufian, *Healing the Land and the Nation: Malaria and the Zionist Project in Palestine, 1920–1947* (Chicago: University of Chicago Press, 2007).
- 2 My father had a close relationship with Ormanian as revealed by letters recently discovered in the archives of the Armenian Patriarchate by George Hintlian.
- 3 In 1884, Strümpel published a textbook on internal medicine that was based on his experiences. This publication, *Lehrbuch der speziellen Pathologie und Therapie der inneren Krankheiten*, was then considered to be the definitive textbook in Germany in regards to internal medicine. It was published in more than thirty editions and was translated into numerous languages, including English in 1887.
- 4 See, for example, Philip Mattar, *The Mufti of Jerusalem: Al-Hajj Amin al-Husayni and the Palestinian National Movement* (New York: Columbia University Press, 1992).
- 5 Taysir Jbara, *Palestinian Leader Hajj Amin al-Husayni: Mufti of Jerusalem* (Princeton, NJ: Kingston Press, 1985), 16–17.
- 6 Eran Dolev, *Allenby's Military Medicine: Life and Death in World War I Palestine* (London: I. B. Tauris, 2007), 208.
- 7 Information about the history of malaria was gathered from: Centers for Disease Control and Prevention, "The History of Malaria, an Ancient Disease," *CDC.gov*, updated 11 March 2016, online at www.cdc.gov/malaria/about/history/ (accessed on 26 August 2016).
- 8 The Spanish also introduced malaria to the Americas.
- 9 Hence the presence of huge underground cisterns beneath the Temple Mount.
- 10 E. W. G. Masterman, "The Water Supply of Jerusalem, Ancient and Modern," *Biblical World* 19, no. 2 (February 1902): 87–112.
- 11 Municipal running water became available only after the British mandate was established.
- 12 For example, there were several public wells in the Armenian convent.
- 13 Captain Wilson and Captain Warren, *The Recovery of Jerusalem: A Narrative of Exploration and Discovery in the City and the Holy Land* (London: Richard Bentley, 1871), 17.
- 14 George H. Whitney, *Handbook of Bible Geography* (New York: Eaton and Mains, 1899), 189.
- 15 A. M. Luncz, ed., *Jerusalem Year-Book for the Diffusion of Accurate Knowledge of Ancient and Modern Palestine* (Vienna: Georg Brog, 1882; facsimile edition, Jerusalem: Carta, 1982), especially 115–123. As to possible causes of malaria, Luncz proposed "exhalations from the Dead Sea," infusoria (minute aquatic creatures), and the heavy night dew!
- 16 Masterman, "Water Supply," 109–112.
- 17 John Cropper, "The Malarial Fevers of Jerusalem and Their Prevention," *Journal of Hygiene* 5, no. 4 (Oct. 1905): 460–66.
- 18 Michelle U. Campos, *Ottoman Brothers: Muslims, Christians, and Jews in Early 20th Century Palestine* (Stanford: Stanford University Press, 2011), 174.
- 19 For examples of this type of sentiment, see Yehoshua Ben-Arieh, *Jerusalem in the Nineteenth Century: The Old City* (New York: St. Martin's Press, 1984), especially chapter 4.
- 20 Mark Twain, *Innocents Abroad* (New York: Penguin, 2002), 423.
- 21 Justin McCarthy, "Population," in *Encyclopedia of the Palestinians*, ed. Philip Mattar (New York: Facts on File, 2005), 398. For contemporary data, see: "State of Palestine," *UN Data: A World of Information*, online at data.un.org/CountryProfile.aspx?crName=State%20of%20Palestine (accessed 26 August 2016).
- 22 As Jeffrey Sachs and Pia Malaney note: "Where malaria prospers most, human societies have prospered least." Moreover, they state that "There are multiple channels by which malaria impedes development, including effects on fertility, population growth, saving and investment, worker productivity, absenteeism, premature mortality and medical costs." Jeffrey Sachs and Pia Malaney, "The Economic and Social Burden of Malaria," *Nature* 415 (7 February 2002): 680–85.
- 23 Population figures for 1844, recorded by the Prussian consul, come from: Ernst Gustav Schultz, *Jerusalem, eine Vorlesung* (Berlin:

- S. Schropp, 1845), 33–34. Figures for 1853, recorded by a French diplomat, come from: César Famin, *Histoire de la rivalité et du protectorat des églises chrétiennes en Orient* (Paris: Firmin Didot frères, 1853), 49. Figures for 1864, recorded by the British consulate, come from “Report on the Commerce of Jerusalem in the Year 1863,” May 1864, in the National Archives (UK), Foreign Office (FO) 195/808, as quoted in Dore Gold, *The Fight for Jerusalem: Radical Islam, the West, and the Future of the Holy City* (Washington: Regnery Publishing, 2007), 120. Figures for 1867 come from Mark Twain, *The Innocents Abroad, or the New Pilgrims’ Progress: Being Some Account of the Steamship Quaker City’s Pleasure Excursion to Europe and the Holy Land* (New York: Harper and Brothers, 1911), vol. 1, 295. Population figures for the remaining years are taken from Ruth Kark and Michal Oren-Nordheim, *Jerusalem and Its Environs: Quarters, Neighborhoods, Villages, 1800–1948* (Jerusalem and Detroit: Hebrew University Magnes Press and Wayne State University Press, 2001), 28.
- 24 Searching the blood smear was by then a routine procedure. Jerusalem also had a reputable laboratory, the Pasteur center.
 - 25 Luncz, *Jerusalem Year-Book*, 118.
 - 26 See: Ernest Masterman, *Hygiene and Disease in Palestine in Modern and in Biblical Times* (London: Palestine Exploration Fund, 1920); John Cropper, “The Geographical Distribution of Anopheles and Malarial Fever in Upper Palestine,” *Journal of Hygiene* 2, no. 1 (January 1902): 47–57; Cropper, “Malarial Fevers of Jerusalem”; and Israel J. Kligler, *The Epidemiology and Control of Malaria in Palestine* (Chicago: University of Chicago Press, 1930).
 - 27 Cropper, “Malarial Fevers of Jerusalem,” 464.
 - 28 *New York Times* (24 April 1913).
 - 29 Sufian, *Healing the Land*, 79.
 - 30 Conde de Ballobar, *Jerusalem in World War I: The Palestine Diary of a European Diplomat*, ed. Eduardo Manzano Moreno and Roberto Mazza (London: I. B. Tauris, 2011), 201.
 - 31 Salim Tamari and Ihsan Salih Turjman, *Year of the Locust: A Soldier’s Diary and the Erasure of Palestine’s Ottoman Past* (Berkeley: University of California Press, 2011); Sami Hadawi, “Sodomy, Locusts, and Cholera: A Jerusalem Witness,” *Jerusalem Quarterly* 53 (Spring 2013): 7–27.
 - 32 Hadawi, “Sodomy, Locusts, and Cholera.”
 - 33 Hadawi, “Sodomy, Locusts, and Cholera,” 19.
 - 34 A. E. Breen, *A Diary of My Life in the Holy Land* (Rochester, NY: John P. Smith Printing Co., 1906), 175.
 - 35 Zohar Amar and Efraim Lev, “An Early Glimpse at Western Medicine in Jerusalem, 1700–1840: The Case of the Jews and the Franciscans’ Medical Activity,” *Vesalius* 11, no. 2 (2005): 81–87.
 - 36 Quote recollected by author from his mother, Satenig Kalbian (1888–1970).
 - 37 Reitfler, 80.
 - 38 David Reifler, *Days of Ticho* (Geffen Publishing, 2015), 136.
 - 39 Sufian, *Healing the Land*, 26.
 - 40 “History of Malaria Control,” Retrieved 2009-10-27.
 - 41 Bernard J. Brabin, “Malaria’s Contribution to World War One – the Unexpected Adversary” *Malaria Journal* 13 (2014): 497.
 - 42 Smallman-Raynor MR, Cliff AD, 2004. “Impact of Infectious Diseases on War,” *Infectious Disease Clinics of North America*. Vol. 18(number 2), 341-368.
 - 43 Smallman-Raynor MR, Cliff AD, 2004. “Impact of Infectious Diseases on War.”
 - 44 The Egyptian Labor Corps was part of the Egyptian Expeditionary Force (EEF). This information is from personal observations of my father, Dr. Vahan Kalbian, as conveyed to me in the early 1950s.
 - 45 G. Dennis Shanks, “Simultaneous Epidemics of Influenza and Malaria in the Australian Army in Palestine in 1918,” *Medical Journal of Australia* 191, no. 11 (2009): 656.
 - 46 Haim Goren, Eran Dolev, Yigal Sheffy (eds.), *Palestine and World War I: Grand Strategy, Military Tactics and Culture in War* (New York: I. B. Tauris, 2014), 129.
 - 47 See for example, Masterman, E.W.G. “Jerusalem from the Point of Health and Disease,” *The Lancet* 1918/1, 305, and Cropper, “Geographical Distribution,” 406.
 - 48 Sufian, *Healing the Land*, 84.
 - 49 “A Brief Record of the Advance of the Egyptian Expeditionary Force under the Command of General Sir Edmund H. H. Allenby, July 1917 to October 1918” 2nd ed. (London: His Majesty’s Stationery Office, 1918), 105. Bwire, *Bugs in Armor*, 52.
 - 50 Robert Bwire, *Bugs in Armor: A Tale of Malaria and Soldiering* (Nebraska: Iuniverse.com, 2001), 52.
 - 51 Sufian, *Healing the Land*, 85.
 - 52 Melanie Schultz Tanielian, “Disease and Public Health (Ottoman Empire/Middle East)” in 1914-1918-online. *International Encyclopedia of the First World War*, ed. By Ute Daniel, Peter Gatrell, Oliver Janz, Heather Jones, Jennifer Keene, Alan Kramer, issued by Freie Universität Berlin, Berlin 2014-10-8.
 - 53 Brabin, “Malaria’s Contribution,” 9.
 - 54 Shanks, “Simultaneous Epidemics,” 655.
 - 55 Sufian, *Healing the Land*, 85
 - 56 Shanks, “Simultaneous Epidemics,” 654.
 - 57 Waserman, M. and Neumark, Y. “The Conquest

- of Malaria,” in Waserman, M. and S.S. Kottek, (eds.), *Health and Disease in the Holy Land* (Lewiston: Edwin Mellen Press, 1996), 389-394.
- 58 Spanish flu did not start in Spain, but because Spain was not a belligerent and therefore had no press censorship, the Spanish press was the first to publish its arrival in Europe.
- 59 G. Dennis Shanks, “Synergistic Mortality Caused by *Plasmodium falciparum* during the 1918 Influenza Pandemic,” *American Journal of Tropical Medicine and Hygiene* 92, no. 5 (6 May 2015): 941–42.
- 60 *Jerusalem Post* 05/02/2009. 23:21
- 61 Wasif Jawhariyyeh, *The Storyteller of Jerusalem: The Life and Times of Wasif Jawhariyyeh, 1904–1948*, ed. Salim Tamari and Issam Nassar (Northampton, MA: Olive Branch Press, 2014).
- 62 Comte de Ballobar, *Jerusalem in World War I*, 210. Possibly the locals were so used to malaria that they did not think it worth mentioning
- 63 Many of our friends lost their first born- Hagop Melikian, Levon Kevorkian
- 64 Comte de Ballobar, *Jerusalem in World War I*, 210.
- 65 John H. Melkon Rose, *Armenians of Jerusalem*. (Cambridge: Radcliffe Press, 1993), 26.
- 66 Rose, *Armenians of Jerusalem*, 26.
- 67 More U.S. soldiers died from the 1918 flu than were killed in battle during the war. Forty percent of the U.S. Navy was hit with the flu, while 36 percent of the Army became ill. Gina Kolata, *Flu: The Story Of The Great Influenza Pandemic of 1918 and the Search for the Virus that Caused It* (New York: Farrar, Straus, and Giroux, 2001), 7.
- 68 Personal communication with Prof. P. A. Buxton, University of London, School of Tropical Medicine and Hygiene, 1952.
- 69 Unfortunately the mosquitoes developed a resistance to DDT just as its toxicity to humans became evident which made it obsolete.
- 70 V. H. Kalbian and V. V. Kalbian, “Clinical Trials with Camoquin in Malaria,” *Journal of Tropical Medicine and Hygiene* 55, no. 10 (Oct. 1952): 218–220.