

# Tawfik Canaan: A Pioneer Leishmaniologist from Palestine

## BIOGRAPHY

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Tawfik Canaan 1882-1964

## Early life, study and work

Tawfik Canaan was born in 1882 in Bet-Jala near Bethlehem in Palestine. He finished his schooling at Schneller School and traveled to Beirut in 1899 to complete his study in Medicine at the Syrian Protestant Collage. He graduated as a physician in 1905. Then, returned back to Al-Quds (Jerusalem) and worked in

the German Hospital. In 1910 he became the director of the clinic of Al-Quds (Jerusalem) municipal hospital, Schaare Zedek. In 1912 he was married to a German and moved to Musrara neighborhood in Al-Quds (Jerusalem) where he established his own clinic in 1913. He specialized in tropical medicine and microbiology in Germany between 1912 and 1914. In 1914, he was appointed as a physician in the Turkish army in Nazareth and head of the Turkish army medical laboratories in Nablus, Beer al-Saba', Gaza and Al-Quds (Jerusalem). At the beginning of his carrier, Canaan became responsible for preparing vaccines and antibiotics at the health office in Al-Quds (Jerusalem). He was later appointed as the head of Malaria research branch. He got more and more involved in the medical activities and community health and therefore became director for the Leprosy Hospital in Talbiyyah in Al-Quds (Jerusalem) in 1919 and, later, in 1956, participated in building a new one near Birzeit near Ramallah. Following the 1948 political turmoil (Nakba), Canaan was appointed as head of the Lutheran World Federation medical operations to cope up with the efflux of refugees by mobilizing mobile clinics and building others.

Later on his efforts succeeded in convincing UNRWA (United Nations Relieving and Works Agency for Palestinian Refugees) and the Lutheran World Federation to establish Al-Muttala' Hospital at the Augusta Victoria Hospice on At-Tour (Mount of Olives) in Al-Quds (Jerusalem). He was the first medical director until 1955 (Nashef, 2006). Canaan died in 1964 at his premises in the Al-Muttala' (Augusta Victoria) Hospital which he helped to establish and was buried in Bethlehem (Nashef, 2006).

## Academia

Canaan was a member and the secretary of the Palestine Oriental Society from 1920-1939. He contributed regularly to its journal, The Journal of the

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Palestine Oriental Society by publishing a significant amount of his research therein. He was also a member of the American School of Oriental Studies.

In 1944 he, with other colleagues, founded the Palestine Arab Medical Association. He headed the society and became a member of editorial board for its journal *al-Majallah at-Tibbiyyah al-'Arabiyyah al-Filastiniyyah* in Arabic and English which was issued in December 1945. (Nashef, 2006). The journal ceased to exist in 1948.

## Scientific Research

Canaan's first publication in health and medicine was in 1905 (Canaan, 1905). However, his real start in research was with Dr. Muellens, the director of the health office in Al-Quds (Jerusalem) in the field of tropical diseases in 1912. He also conducted research on tuberculosis under the supervision of Hans Much and on dengue fever (Canaan, 1913). He was successful in building a vast network of relationships with many scientists and medical professionals.

Apparently, Canaan extensively focused on building relationship with German scientists starting from Dr. Gruendorf, head of the German Hospital and Dr. Adolf Einzler in Al-Quds (Jerusalem). Others included Dr. Moritz Wallach, Director of Scharee Zaedik Hospital, professors Mühlens, Ruge, Much, and Huntemüller as well Saul Adler, a prominent leishmaniologist in Palestine. These extensive relationships bore fruits for about 94 publications starting from 1905 till 1964, out of which 36 were medical articles. These were published in Arabic German or English journals.

## Leishmaniasis, Jericho boil

During his career life, Canaan had made significant contribution to the study and understanding of the epidemiology and diagnosis of leishmaniasis (Jericho boil) in Palestine either by conducting the research or helping those who intended to do so. Canaan was consulted by visiting scientists and sometimes shared clinical specimen with them. This scientific collaboration was meant to drive health research in Palestine.

A shear example is the collaboration with Huntemueller, a German physician, who mentioned Canaan in his publications. Huntemueller visited Canaan's clinic in Jerusalem who showed him some Leishmania cases from natives attending his clinic (Huntemueller, 1914). Two years later and in 1916 Canaan published his first work on leishmaniasis

entitled "Die Jerichobeule" or "The Jericho boil" in a German journal. In this article he mentioned that he helped Huntemueller with his research in 1913 by verifying Leishmania cases for him through microscopic examination.

Canaan reported that he observed Leishmania cases mainly from Jericho and neighboring areas like Duke and al-A'uja villages. He insisted that leishmaniasis was restricted to Jericho (Ariha) only, not to places nearby like wadi quilt, and to people who visit Jericho such as tourists and soldiers. Canaan described some of the epidemiological features of the infection such as affecting all ages, body sites of infections, incubation period, number of lesions observed on some patients, effect of dress on location of infection, type and characteristics of lesions, being transmitted by insects, diagnosis of lesions, and morphology of the observed parasite. Canaan described the geographical and topography of the area where Leishmania prevails. He also denied Huntemueller's claim of finding new parasite called *Plasmosoma jerichoense* and insisted that it was simply *Leishmania* parasite. Finally, Canaan presented the treatment of *Leishmania* at that time which was mainly Neosalvarsan, a chemical agent used against syphilis before inventing antibiotics in 1940s (Canaan, 1916).

In 1929 Canaan published his second article entitled 'The Oriental Boil: An epidemiological report in Palestine' in an English journal (Transactions of the Royal Society of Tropical Medicine and Hygiene). In this work he showed a change in the distribution of leishmaniasis in Palestine in which he reported cases outside Jericho such as Ein Karim, an Arab village near Al-Quds (Jerusalem), A'rtuf, Amman, Beit-Sahour and Beit-Jala. In this work he compared the Jericho focus with that of Aleppo in terms disease characteristics. In the 1929 article, the medical terminology has developed and became more technical reflecting better understanding of the disease behavior and determinants. For instance, using Leishman-Donovan bodies to designate the parasite form infecting the host, the involvement of *Phlebotomus papatasi* sand fly as a vector, sand fly infection rate, seasonality of infection, night biting habits of sand fly, infection sites of the host in which exposed sites namely limbs and face are more prone to infection, age group of hosts as children are more exposed to infection and incubation period. Canaan confirmed the absence of mucocutaneous leishmaniasis in Palestine. Within a decade from his first publication on leishmaniasis in 1916, he became more experienced in the field. He built more relations with the leishmaniologists of his time such as Destrowsky, Adler and Theodor, Katzellenbogen,

Huntemueller and others. He was already aware of their work and efforts in the field. Visceral leishmaniasis (VL) which Canaan designated as leishmaniasis vesceralis (Kala-azar) was first reported by him in Al-Quds (Jerusalem) in 1931 and by Ostrovsky in Haifa in 1930. He even mentioned that cases were present even before these dates but never on an epidemic scale (Canaan, 1931, 1937 and 1945).

In 1945 Canaan published his third article on leishmaniasis in Palestine. The article is overwhelming and reports both cutaneous and visceral forms of leishmaniasis in the Mediterranean basin including Sudan. Canaan reported 67 cases of VL in 51 sites in Palestine. Al-Quds (Jerusalem), Jaffa, Burkin, Yazur, Bet A'tab, Birzeit, Beit Iksa, Haifa, Nablus, Tulakrem, Lyddah (al-Lidd) and Halhul near Al-Khalil. VL was recorded in the mountainous and coastal areas and affecting all age groups with children comprising more than half of the cases. Arabs and Jews were infected alike. One Jewish girl who had a *leishmania infantum* case showed lesion on the cheek.

This article traced the change of epidemiology of cutaneous leishmaniasis (CL) in Palestine (Figure 1).

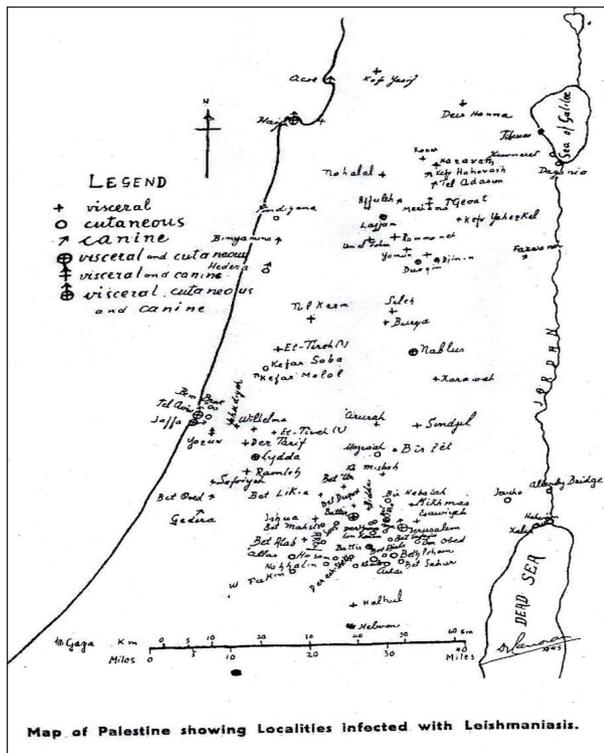


Figure 1: Map of Palestine showing localities infected with leishmaniasis as drafted by hands of Tawfik Canann (Canann, 1945)

Before the World War I, leishmaniasis was restricted solely to Jericho (Ariha), but in the 1930s and 40s cities like Beit-Jala, Beit-Sahur, Bethlehem and Irtas, a village nearby, became active CL foci. Canaan

explains this spread as contamination arising from Jericho, Jewish immigrants and Egyptian Army. He, in the article, traced the epidemics of CL and VL in Palestine prior to World War I till 1945 and tried to find differences between the two forms of infection in terms of vectors and hosts including dogs. He described canine leishmaniasis and infantile leishmaniasis in the village of Yazur near Jaffa and other Jewish settlements in 1943 based on work done by Adler. At the end of his work he proposed ways to control the disease such as adopting a reporting system that classifies leishmaniasis as an obligatory reportable infection, killing all infected and suspected animals (Canaan, 1945).

In general, Tawfik Canaan was the first Palestinian scientist to show interest in leishmaniasis as an infection affecting Palestine and other neighboring countries since his graduation in 1910. From his first publication on leishmaniasis in 1916 to his last in 1945, the scope of his research showed to be developing fairly well but remained as descriptive epidemiology based on his own findings, official statistics and data from his colleagues like Adler and Katzellenbogen. It's only after many years to come starting from 1970s that other Palestinian scientists started to pay attention to leishmaniasis.

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