Apresentação histórica / Historical introduction
Adolpho Lutz and controversies over leprosy

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One of the most interesting chapters of Adolpho Lutz’ scientific work is that dealing with leprosy,¹ a topic he investigated until the end of his life. By then one of Brazil’s leading experts in this field, he went to his death convinced the disease was transmitted by mosquitoes. He had turned his interest to the illness during an era marked by major theoretical and practical turbulence over conflicting views on its etiology, transmission, and prophylaxis.

Among scholars of leprosy from both past and present there is a consensus that two Norwegian physicians, Daniel Cornelius Danielssen (1815-1894) and Carl Wilhelm Boeck (1808-1875), established the disease’s defining characteristics on scientific bases in 1847. While Danielssen and Boeck did not discard a possible association with dissolute, unsanitary living conditions or an unhealthy environment – as upheld under the neo-Hippocratic paradigm in the case of many other diseases – they maintained that leprosy was essentially a hereditary disease.² As this belief spread, the fear long instilled by the disease diminished, at least among doctors. Under the new assumption that leprosy was not contagious, previous concern over the need for strict isolation or segregation of its sufferers waned. Extending to the bubonic plague, cholera, yellow fever, and other diseases (Ackerknecht, 1948), this anticontagionist vogue was of short duration, and by the late 1870s it had already begun to ebb.

Leprosy was one of the first infectious diseases to be restructured in the light of microbiology, once again by a Norwegian, Gerhard Armauer Hansen...
Hansen named the small rod-shaped bodies that he observed in the cells of cutaneous tubercles “Bacillus leprae,” since their constant presence in examined skin lesions made him suspect they were the specific cause of the disease. Hansen reported his discovery to the Cristiania Medical Society in 1874, and his finding was soon after confirmed by Edwin Klebs. Using material provided by Hansen, Albert Neisser offered a more consistent description of the bacillus in 1879, thanks to pioneer use of staining techniques that gained prime importance in the observation of this and other microorganisms.

As Obregón (1996, p.173-4) has shown, a clash then arose between two opposing sets of conceptions and ‘evidence’ on how leprosy is transmitted, giving birth to divergent strategies for dealing with the disease. The physicians and lay public involved in this controversy took as “ideal-types” the prevention models adopted in two different regions of the world: the “democratic” model, which got its start in Norway at a time when nationalism was on the rise and doctors were greatly interested in the study of territory, population, and epidemiological profiles; and the segregationist, colonialist model enforced in Hawaii by metropolitan administrators who were repulsed by leprosy and nourished a strong prejudice against native or Asian-blooded sufferers.

In different countries or colonies, physicians then recently converted to bacteriology were unsuccessful in their attempts to replicate Hansen’s bacillusin vitro and in anima vili, so as to satisfy Koch’s prerequisites as postulated in the early 1880s: isolation of the microorganism in pure cultures, experimental inoculation of animals, and production of a disease whose symptoms and lesions were, if not identical, at least equivalent to those of the disease as “typical” in man.
These problems made it hard to unequivocally prove a connection between the bacillus and leprosy. Nevertheless, the 1st International Leprosy Congress, held in Berlin in October 1897, acclaimed this specific etiology, along with the thesis that the only way to keep the disease from spreading was mandatory reporting, supervision, and quarantine of its victims. Based mainly on epidemiological observations presented by doctors working in India, the Guyanas, and other colonial territories, the congress approved resolutions that affirmed the sovereignty of contagion over heritability in transmitting the disease, although the latter theory still had numerous proponents, foremost among these Rudolf Virchow, Hans von Hebra, and the Turkish physician Demetrius Zambaco Pacha (Obregón, 2000, p.271; 1996, p.165-6).

The ‘construction’ of leprosy as a microbial disease spurred a worldwide movement to create leprosariums where the afflicted would be segregated. Because of the problems in obtaining a vaccine,4 the disease was considered chronic and incurable, reinforcing the belief that its carriers must inevitably be segregated.

Held in Bergen, Norway, in 1909, the 2nd International Congress, chaired by Hansen, ratified the decisions made earlier in Berlin. In 1922, in Rio de Janeiro, with Carlos Chagas acting as chair, the 1st American Leprosy Congress remained firm in this tendency while nevertheless making room for a third stream of thought, led in Brazil by Adolpho Lutz: that leprosy was transmitted by mosquitoes, just as yellow fever and malaria were. Lutz was one of the organizers of the event, which was attended by representatives from thirteen countries. The congress’s conclusions stressed the need to foster scientific investigations of the disease and to create specific professorships at medical schools.

Leprosy studies from 1860-1890

At the time that Adolpho Lutz took up his interest in leprosy, one of Brazil’s main treatment and research centers was Lazarus Hospital in Rio de Janeiro (Smith, 2003), under the auspices of the Irmandade do Santíssimo Sacramento da Candelária. From reports written by Dr. João Pereira Lopes, physician at the hospital during the period leading up to Lutz’ involvement in the field, we can evaluate the state of the art which Lutz was about to help change.

In his report on the year of 1869,5 Lopes discussed several hypotheses concerning the etiology of leprosy; while emphasizing syphilitic, nutritional,
and climatic origins, he also did not abandon the eclectic or multicausal tendency prevalent among doctors working with this disease, often called ‘Greek’ elephantiasis (Elephantiasis Graecorum) or morphea in Brazil at that time. One vital aspect of the problem was the idiosyncrasies displayed by certain individuals – that is, the particular state of the organism (imprecisely defined) that determined a tendency to develop the disease. Some believed that certain professions, such as blacksmithing or mining, contributed to a predisposition. Another assumption was that climate had a notable influence on the appearance of leprosy. Many stressed the role of food, while not necessarily failing to endorse the widely-held belief that this disease was similar in nature to syphilis, caused by a “virus” (understood to mean ‘poison’) that acted on the blood, disorganizing the ‘crasis’ of this humor. A related theory posited that syphilis was nothing more than a degenerate form of leprosy.

Lopes was an anticontagionist, and this seems to have been the predominant position among doctors of his day, shared as well by many members of the lay public. At least this is what his 1869 report suggests: Lazarus Hospital was “constantly visited by people from all classes and ranks, both Brazilian and foreign, most especially by physicians … drawn by curiosity or the news of a cure, announced in daily papers.” Many families were not afraid to pay a visit to the beautiful building constructed in São Cristovão, near the imperial family’s residence, or to attend religious ceremonies there. “Long gone are the times,” wrote Lopes,

> when Christian charity fled in terror … thanks to the progress of science, which has so clearly shown us that the idea of contagion, once so prevalent … has wholly disappeared in view of the numerous observations of noteworthy practitioners in Africa, North America, Norway, Brazil, and, lastly, France, as made by Alibert and Biett. (cited in Souza Araújo, 1946, p.469)

Despite this optimism, which warranted bringing the disease’s victims somewhat back into the society from which they had for so long been removed, the treatment of leprosy was characterized by the “obscurity of darkness, [by] tremendous chaos” (ibid., p.463-4). Lazarus Hospital had long been – and to judge from reports by Lopes’ successors, would still long be – a stage for endless experimentation. What is curious is that both lay people and experts seem to have wielded almost equal influence over the medicines tried out during the 1860s and 1870s, medicines which might equally well include preparations from local apothecaries, chemotherapeutics produced at European laboratories, or substances extracted from either local or foreign flora and fauna.
Lazarus Hospital had been the setting for a famous experiment with tropical rattlesnake venom (\textit{Crotalus horridus}) that had killed the patient who served as experimental subject (Ferreira, 1996). Lopes had already tested a variety of plants supplied by physicians or lay people: roots of the \textit{mochocho} plant; \textit{cabeça-de-frade} (\textit{Melocactus bahiensis}); and the milky juices of the Barbados nut (\textit{Jatropha curcas}), \textit{figueira-brava} (\textit{Ficus} sp.), and a type of manioc (\textit{Manihot utilissima}). Among the populations of Brazil’s \textit{sertão} region, the “irritating, corrosive” juice of the latter tuber was known to help cure elephantiasis. Another plant extolled by them “as astonishingly efficient” was the yam, eaten or used in bathing.

Four experiments were underway at Lazarus Hospital at the close of 1868. One involved “warm baths with spiderwort (\textit{Tradescantia} sp) and \textit{mamono branco}, a kind of papaya (\textit{Carica} sp.); a cooked mixture of barley, sarsaparilla (\textit{japecanga}), and whey,” where the tubercles would be rubbed with “large gastropods, which should be kept in grasses or the garden.” The diet consisted of plants like “amaranth (\textit{caruru miúdo}), chicory, beet, sowthistle, and, lastly, yam (\textit{inhame branco}); the sick person [could] eat some eggs, drink barley coffee, and even eat some very ripe oranges. Once in a while, the person should take some purgatives of trimeza (\textit{Trimezia} sp.).” (Lopes, p.34, as cited in Souza Araújo, 1956, p.461).

Since leprosy was likened to syphilis, this led to experimentation with \textit{Hydrocotyle asiatica}, a product that doctors Paupeau, Boileau, and Hunter supposedly employed most successfully in the treatment of scrofulas as well. It could also be used to treat the chronic rheumatism that afflicted so many of those interned at Lazarus Hospital.
Preparations of arsenic – which “Hindu physicians and those from Bengal, and also English and Anglo-American doctors” touted in the treatment of leprosy and syphilis – yielded almost no positive results. In 1869, Lopes also experimented with bromine and bromine compounds, in combination with baths of “sulphurous hepatic waters” prepared by a pharmacist from Rio de Janeiro for those who suffered from “rheumatism of the joints, paralyses, chronic syphilitic ulcers, and, lastly, scabies, which run rampant in this hospital two to three times a year” (cited in Souza Araújo, 1946, v.1, p.461).

The hiring of Dr. José Jeronymo de Azevedo Lima to head up Lazarus Hospital in 1879 coincided with a reversal at the level both of discourse and of curative and preventive practices. The physician began his first report (Lima, Aug. 5, 1880) by attempting to restore belief in leprosy’s contagiousness. Although this idea had held sway in the past, it had become so “outside reason” since the studies of Danielssen and Boeck, von Hebra, Virchow, and others that, for Azevedo Lima, questioning these authors meant “risking an accusation of incompetence” (cited in Souza Araújo, 1946, v.1, p.484).

There were as yet scant authorities whose names could be cited in defense of contagion. Azevedo Lima drew support from Hansen’s newest studies but he admitted that these were not “certain and proven.” Contemporaneous etiological theories did a better job of explaining the numerous examples of immunity observed “in relations of the greatest intimacy.”

Studies on the morphology and culture of *Bacillus leprae* were still incomplete. Its presence in blood had not yet been proven, “but,” Azevedo Lima wrote, “this notwithstanding, the classic doctrine on the illness has still been … deeply shaken, which will undoubtedly prove fruitful for practical deductions and, perhaps, come to place it among the cast of virulent affections” (ibid., p.485).

In the absence of any means for effectively combating the disease, there was no alternative but “a more or less rational empiricism,” and Azevedo Lima experimented with a good number of medicines with different effects and properties. The basis of his treatment was to “boost or maintain organic forces by modifying nutrition, through good-quality food … regular exercise of skin functions, etc.” (cited in Souza Araújo, 1946, v.1, p.485-8). Disinfection of infirmaries became routine, and to the list of medications in use was added phenic acid, a well-known antiseptic employed internally and externally against many other microbes incriminated as disease agents by followers of Pasteur and Koch. As will be discussed later, Azevedo Lima began treating leprosy patients with chaulmoogra oil.
In mid-1886, Azevedo Lima reported to the purveyor of the Irmandade do Santíssimo Sacramento da Candelária on the fruitlessness of experimental attempts to transmit leprosy to humans and animals; he also presented an evaluation of the results obtained with the treatment proposed in 1885 by Paul Gerson Unna, one of the world’s leading authorities on dermatology. Basing his approach on the theory that the bacillus is starved for oxygen and that it would be possible to destroy it by means of substances that were similarly oxygen-starved, he had proposed using such reduction agents as pyrogallol, ichthyol, chrysarobin, and resorcin, intus et extra (cited in Souza Araújo, 1946, v.1, p.488).

That same year, Adolpho Lutz released his first paper on the leprosy microbe (1886), which appeared in Monatshefte für Praktische Dermatologie (1887), currently Dermatologische Wochenschrift, a journal edited by Unna, von Hebra and Lassar. This publication was the most important international sounding board for clinical and laboratory experiments related to skin diseases – and, as we will show in the next volume of Adopho Lutz’ Complete Works, dermatologists were at the vanguard of bacteriological, histological, and pathological research on leprosy. Lutz began his studies on this and other dermatological diseases in 1880 when he set up office as a physician in Limeira, a city in the state of São Paulo. By late 1888, he estimated having treated 200 to 250 lepers, “of which 50 would be followed for a long time” (Corrêa, 1992, p.146). He judged that there were then 5,000-10,000 sufferers in Brazil, most of them in São Paulo, which he felt was one of the hardest-hit states.

In March 1885, Lutz left Limeira to work for about a year at the clinic Unna had founded in Hamburg. Under Unna’s orientation, Lutz ventured into the terrain of bacteriology, dedicating himself to the morphology of germs related to different dermatological diseases, mainly leprosy.

Microbiologists were struggling to obtain pure cultures of Hansen’s bacillus. Lutz tried in Hamburg but failed. Nor was he successful in transplanting it from humans to animals, so that the latter would develop a “typical” disease. Study of the microorganism’s structure was facilitated by a staining technique developed by Lutz and Unna. Utilizing this process and the variations on it discovered by Ehrlich, the Brazilian physician was able to differentiate the leprosy agent from other microorganisms, except for the tuberculosis agent, discovered by Koch in 1882. “It is quite an interesting fact,” Lutz wrote, “that two illnesses so similar from an anatomical perspective … are also produced by parasites that barely differ. Neither by shape nor by dye reactions can they be distinguished with certainty” (Lutz, 1887, cited in Souza Araújo, 1946, p.492).
In a paper he published in 1886, Lutz endeavored to show that leprosy “schizomycetes” did not belong to the category of “legitimate bacilli, formed by one or more cylindrical cells,” since their elemental component consisted of a small round cell similar to a *coccus*, with a membrane that became thick and colloidal. These cells always unfolded in the same direction, in a linear series whose form was rod-like or similar to pearl necklaces, with a gelatinous envelope that increased more and more as they gained new layers. The gelatinous agglomeration could coalesce with neighboring ones to form a single mass. A
comparative analysis of this microorganism with that of the tuberculosis microbe prompted Adolpho Lutz to disagree with their classification in the genus *Bacillus* and to propose calling the Hansen microorganism *Coccothrix leprae*. His suggestion was not taken up by the scientific community and was supplanted by Karl B. Lehmann and R. O. Neumann’s 1896 proposal that the agents of leprosy and tuberculosis be classified in the genus *Mycobacterium*.

Problems in cultivating the leprosy microbe and replicating it in animals made contact with those suffering from the disease indispensable, in order to guarantee an ongoing source of organic matter for the preparations used in microscopic studies on the morphology and biology of the microorganism and of its distribution in affected organs and limbs. Because it involved surface and internal examination of cadavers and the bodies of the ill, this second line of investigation required a hospital, and this is undoubtedly what led Lutz to Rio de Janeiro’s Lazarus Hospital in 1887.

That same year he moved from Limeira to São Paulo, the state capital, resumed his private practice, and continued to publish numerous articles, mainly in Germany, not only on dermatology but on helminthology as well. It was then that the Portuguese translation of his work on ancylostomiasis, originally published in Leipzig (1885), came out in *O Brazil-Médico*, which was a series of articles published in Bahia’s *Gazeta Médica* (1887-1889); soon after, it appeared in book form (1888), making Adolpho Lutz better known among his peers in Brazil. In 1889, in the prestigious *Centralblatt für Bakteriologie und Parasitenkunde* (Jena, Germany), he published his first studies on protozoans, the myxosporidia found in the gall bladder of batrachia, an order of animals to which he would return at the end of his life.

**Lutz’ trip to Hawaii**

The next chapter in the active career of physician-researcher Adolpho Lutz would take place in Hawaii. In a letter to Lutz dated October 13, 1886, Paul Gerson Unna informed him of the arrival in Hamburg of the pathologist and bacteriologist Edward Arning, who had worked with leprosy victims in Hawaii from November 1883 through July 1886.

The son of a German merchant residing in England, Arning was born in Manchester on June 9, 1855. At the age of twelve he began studying at the *Gymnasium Johanneum*, in Hamburg, and graduated in medicine from the University of Strassburg in 1879. He began his career in Berlin, as a gynecologist,
but soon became interested in dermatology, becoming a member of the Dermatological Institute of Breslau in 1881. Two years later, he was hired by the Board of Health of the kingdom of Hawaii to investigate leprosy there. The Humboldt Institute of the Royal Prussian Academy of Science requested him to collect material for its ethnographic collections. Arning arrived in Honolulu on November 8 and established his laboratory in Kakaako Hospital.

With the goal of proving that leprosy was contagious, for four consecutive weeks starting in September 1884, Arning inoculated Keanu – a native prisoner sentenced to death – with Hansen’s bacilli. It took twenty-five months for the prisoner to develop nodular leprosy. Nerves and lymph nodes near the site of injection were also affected. Despite controversies over the possibility of Keanu having family members who suffered from the disease, and doubts that arose because of the length of time that had elapsed between inoculation and the presentation of symptoms, this experiment became paradigmatic in the eyes of contagionists and was always referred to in public discussions on the subject over the next few decades. In late 1885, Arning reported on his disappointing attempts to cultivate the bacillus in artificial media and to locate it in the air, water, and food. In mid-1887, the Board of Health fired him, due to differences with Walter M. Gibson, Hawaii’s Minister of Foreign Relations and president of its Board of Health. The bacteriologist then returned to Hamburg, where he resumed his dermatology practice, also teaching a course on the subject at the university there.

As Obregón (2002, p.143-7) has shown, other researchers were to attempt to study leprosy in Hawaii, but their relations with the local hygiene authorities invariably became strained, as a result of the “many inconveniences, obstacles, and small acts of tyranny” they faced in conducting their work.

In the letter to Lutz mentioned previously, Unna wrote that Consul Weber, who represented German interests in Hawaii, had told Unna that the Hawaiian Board of Health no longer intended to support “fruitless scientific experiments with leprosy” but was quite interested in sponsoring “practical experiments aimed at finding a cure.” Unna believed it possible to arrange for a trip to Hawaii, in order to test his therapeutic method there, and wanted to know if the Brazilian physician would be interested in making this trip.

Located in the middle of the Pacific Ocean, the Hawaiian archipelago includes eight principal islands: Niihau, Kauai, Oahu (where the capital is located), Molokai, Lanai, Kahoolawe, Maui and Hawaii. Hawaii, the largest. In 1778, the navigator James Cook named them the Sandwich Islands. North American
Presbyterian missionaries established themselves there in 1820. Seven years later, they were followed by priests of Picpus (Pères et Religieuses des Sacrés-Coeurs), a congregation founded in France in 1800 and dedicated to missionary apostolate. There was a great dispute between the British, French, North Americans, and their religious spearheads over who would control the islands, a dispute which continued after independence in 1842-43. As the result of an 1872 treaty, a native monarchy was made economically dependent on the United States, and in 1887, Pearl Harbor became a North American military base. On July 30, 1889, two months before Adolpho Lutz arrived in Hawaii, an insurrection led by Robert Wilcox attempted to unseat the Reform Party and return lands that had been appropriated by foreigners to Hawaiians and to King Kalakaua. The monarchy was later removed in 1893 by a group that in 1898 would manage to annex the islands to the United States. In 1959, the Hawaiian Islands became that country’s 50th state.

Between 1835 and 1848, the first clinical observations on leprosy in Hawaii were published by the physicians Arthur Mouritz and William Hillebrand. The latter attributed the spread of the malady to what the natives called Mai-Paké (Chinese sickness) during an increase in the number of Chinese immigrants after the discovery of gold in California.13

In August of 1850, Honolulu was officially designated a city; four months later, King Kamehameha III created a Board of Health, with seven members, all of Anglo-Saxon origin. In a report issued in April, 1863, Hillebrand called on the Board to pay attention to the alarming frequency of new cases of leprosy. Prince Lot, who came to the throne the following year with the title of Kamehameha V, conferred upon the doctors Edward Hoffmann and Hillebrand the task of cataloguing the number of cases and of proposing reasonable preventive measures. In response to the suggestion that the sick be quarantined, the king named a commission to draft a law, which was voted on by the legislature and approved by royal decree on January 3, 1865. This law empowered the Board of Health to quarantine all infectious lepers; and authorized the police and judicial agents, when solicited by the Board, to apprehend any suspected cases and upon examination, should leprosy be confirmed, to quarantine the victims. The law also authorized the Board to found a hospital for treatment of incipient lepers could be treated, who would be freed upon cure or definitively quarantined if found to be incurable or contagious. The law also gave the authorities the power to require the sick to work and also to seize their property in order to cover the expenses of quarantine.
Iolani Palace at Honolulu (Whitney, 1890).

Queen Liliuokalani, in 1893 (Hoefer, 1985, p.50).
The Board of Health lost little time. In June of 1865, presided over by Godfrey Rhodes, it decided to create two establishments, one in Honolulu, for the confinement of mild cases, and another in Molokai, for the incurable. On November 13, Kalihi Hospital and Detention Station, under the direction of Dr. Hoffman, were opened in Kalihikai, a town neighboring Honolulu. That same year, 141 lepers were admitted to the institution, and on January 6, 1866 the first group of sufferers of the disease disembarked in Molokai, the world’s first insular leper colony, which, three decades later, would serve as a model for an international movement favoring reclusion in similar institutions for victims of Hansen’s disease (Gussow, 208, 253-4).

Endowed with a mountainous terrain, the island of Molokai was located to the southeast of Oahu and to the northeast of Maui. The part of the island reserved for the leprosarium was a peninsula of about 150,000 m², which
projected out into the sea along the windy northern coast. From the middle of the peninsula arose an extinct volcano, Kauhako. The peninsula was separated from the rest of the island by a steep range of mountains reaching an altitude of 3,600 feet, which formed the spine of the island. “This wall or ‘pali’ is insurmountable, except by means of a trail over the mountain tops, along which lies a ranch belonging to Mr. R. W. Meyer, a German who is the Board of Health agent of the island of Molokai, and interim superintendent of the leprosarium.” 14 There were three towns: Kalaupapa, Makanalua and Kalawao. From 1870 to 1900, a total of 4,739 patients were confined to Molokai. The largest number of patients – 1,213 – occurred in 1890, the year that Adolpho Lutz came to Hawaii as a leprologist.

In 1875, the Kalihi hospital was closed because of the high cost of its maintenance, its imperfect isolation and the ineffectiveness of its treatments. The lepers and those suspected of carrying the disease were taken to police facilities and from there transferred to Molokai. It is possible that the resistance that arose in response to the policy’s lack of humanity may have led to the opening of another hospital, on December 12, 1881, this time in the Kakaabo district, near what is referred to as Diamond Head, in Honolulu. In 1884, an amendment to the penal code authorized the Sanitation Services to create similar hospitals in every island of the archipelago. Everything suggests that the decentralization of these ‘vestibules’ in Molokai did not occur, and in 1889, about two miles from Honolulu, the Kalihi hospital was rebuilt. It was in this hospital, with patients transferred from Kakaabo, that Lutz would work.

(Souza Araújo, 1929, p.80-2, 95-6; Obregón, 2002, p.139-40)

According to Corrêa (1992, p.146), the president of the Board of Health of the Kingdom of Hawaii, Dr. N. B. Emerson, drew up a formal invitation to the Brazilian physician on March 22, 1888. For the rest of the year, the terms of the contract were discussed via correspondence. Lutz requested two thousand dollars in financial assistance for his preparatory studies in Hamburg. A contract with legal guarantees was signed, giving him a monthly salary of 300 dollars and the right to a private clinical practice. 15 The requirement that Lutz reside on Molokai Island was the subject of lengthy epistolary disagreements, since the Brazilian physician intended to set up a private practice in Honolulu and would not agree to large-scale experimentation with Unna’s treatment. In April of 1889, the president of the Board still argued that re-opening the Kalihi hospital would cause much dissatisfaction among the patients, those confined to Molokai as well as those who would be sent there. Adolpho Lutz
remained inflexible, and the Board finally agreed to his trip, in the hopes that he would change his mind after arriving (Law, n.d., p.3).

In July 1889, he traveled to Europe in order to prepare for his stay in Hawaii with Unna’s help. Both men participated in the First World Conference on Dermatology, held in Paris, from August 5-10 of that year.¹⁶ Unna’s disciple reached Honolulu on November 15, the same day that, in Brazil, the monarchy was deposed. In January 1890, he was appointed Government Physician for the Study and Treatment of Leprosy. His work was to be carried out at the Kalihi Receiving Station, future site of the U.S. Leprosy Investigation Station, while broader treatment at the settlement was assigned to the resident physician, under Lutz’ supervision.¹⁷

Two months later, he would have the assistance of an English nurse, whom he would marry the following year.

The successor of Father Damien, martyr of Molokai

Rose Gertrude was the name that Amy Marie Gertrude Fowler had adopted upon becoming a lay sister of the Third Order of Saint Dominic (Corrêa, 1992, p.148-9). She had been born on July 14, 1869 in a small village near Bath, an ancient city of Roman origin. Amy was 25 years old, and had two sisters and a brother. With a penchant for mysticism, she had converted to Catholicism, an unexpected decision for the daughter of an Anglican pastor highly regarded in the village. Bertha Lutz (Lutziana) attributes the conversion to a “very enlightened” sister who lived in London, gave poetry recitals, and had wanted to be an actress. In those days, however, it was unthinkable for a young girl of family to have such a profession. Her consequent rebelliousness led to her conversion to Catholicism. Amy went to live with her. She wanted to study, to have a profession. Like other young women of her class, she was profoundly influenced by the example of Florence Nightingale (1820-1910), who cared for the wounded during the Crimean War (1855-1856), organizing emergency hospitals and working to improve conditions of hygiene through innovations that would later be adopted by all countries and by the Red Cross. Amy studied nursing in London, then spent a period in Paris, where she lived in a convent, studied microbiology at the Pasteur Institute, and worked in an office belonging to a family friend.

Upon returning to London,
the young English girl who... was in search of her vocation read in an English newspaper... that the doctor in charge of the leper hospital in Honolulu had complained to the local legislature that there were not enough nurses. ... In an impetuous act of admiration, and, emulating Florence Nightingale, [Amy] wrote to the British Society for Assistance to Lepers, offering to go to Honolulu, as a volunteer nurse. (Lutz, Lutziana)

In a letter dated June 18, 1889, addressed to the superintendent of the Molokai Leprosarium, she declared,

I am willing to make any sacrifice in order to serve in some way these poor creatures. It is indeed with the hope of seeing this long-cherished desire realized that I have placed myself under Hospital Training in a Hospital and Workhouse in England, and for the last eighteen months have been studying and attending Cours in France more especially of the discoveries of Monsieur Pasteur and of Microbiology ... In my Hospital training I have been through drudgery and mere everyday commonplace work, as well as dressing and bandaging, and am willing to fulfil the humblest duties. I would ask you to be so very good as to send me an early reply, as should you not be able to allow me to settle in the Island, I should give myself to an Indian Establishment for Lepers. (cited in Corrêa, 1992, p.149; and Law, n.d., p.1)

This letter was written two months after the death of Joseph de Veuster, or Father Damien, a member of the Belgian Picpus congregation. Father Damien had come to Oceania in 1863 to care for lepers and died from the disease in Molokai, on April 15, 1889. His death had enormous international repercussions, in addition to inspiring Amy to follow his example, and Molokai became a sinister legend in the contagionist literature, taken as a symbol of the dangers leprosy posed to society and of the European fear that this incurable, degenerative disease, which flourished in far-off parts of the world among peoples that God had forsaken, would also take over Europe.

The Hawaiian Board of Health offered Amy a position in Kalawao, as assistant to Dr. Swift, and promised her room and board, a horse, and a servant, as well as $20 a month, and $300 for her travel expenses. In a letter dated December 19, 1889, she stated that she would arrive in Honolulu in February of the coming year. Her trip was made under the aegis of the Society
for Assistance to Lepers, whose patron was the Prince of Wales, later King Edward VII. Queen Victoria then opened a call for donations to be taken with the altruistic nurse.

After everything had been settled, she left for the United States, her trunks filled with presents for the lepers, including sheets embroidered with ‘VR,’ for Victoria Regina ... she made a triumphant trip from New York to San Francisco, on a special train, with a number of cars that were filled with gifts ... pianos, conserves, and everything imaginable.20

On February 27, 1890, the newspapers in San Francisco, California, reported the arrival of the young heroine and her imminent departure for Hawaii. The diary of Sister Leopoldina Burns, cited by Law (n.d., p.2), gives eloquent testimony to the expectations that Amy’s trip had awakened among the people of the islands:

trumpets sounded over the vast Atlantic; an English gentlewoman who had been drawn by the good works of the saintly Father Damien... after being applauded and encouraged by the royal family, and the celerity of the Prince of Wales, now found herself riding the crests of the waves on her way to Hawaii where she intended to carry out her life’s work ... in Molokai. The sounds of the trumpets had carried over the Atlantic and had been heard by the wealthy class in the city of New York, who welcomed her. Trunks filled with valuable objects were sent from England and from New York, some of which the Board of Health sent to our mother, for her to distribute among her children ... Miss Fowler received a donation of two splendid new pianos for her use, one with her name, Sister Rose Gertrude,
engraved in beautiful characters. One day, while I was cutting cloth to make trousers for the children, Dr. Swift came in the door. He is always in a hurry. The natives refer to him as Makani, which means wind.

“Oh, sister, today I received a marvellous letter from Amy Fowler. I tell you, my sister, that a woman capable of writing a letter like that would be able to work wonders.”

Among the documents compiled by Law on the subject of Amy and her trip is a letter that Brother Joseph Dutton sent to Father Hudson, of Notre Dame University before her arrival. Dutton lamented the fate of the poor English girl who was doubtlessly moved by sincere sentiments but unaware of the reality that awaited her.

The things she proposes doing as stated by her interviews are not the things the Govt. desires nurses for. The remedy she proposes using has had its day here years ago. Nor is it likely she would be allowed any discretion in use of Govt. medicines, and at present no remedy for leprosy is in use here. The people are being now given a rest from the trouble and pains of experiments. However useful they may be to science and for benefits of generations to come, they are a discomfort to the people experimented on. (Law, n.d., p.2)

Dutton, who knew very well the way of life in Molokai, described to Father Hudson incidents evoking a scenario of barbarism and primitivism, which he felt lay in store for the lady from England. He wrote of the habit that the sick had of picking lice from each other’s heads; of their predilection for dog meat; of the flies that swarmed in droves everywhere. “Do you think Miss Fowler will like it here?” (cited in Law, n.d., p.3).

In a letter dated March 18, 1889 – but which in reality is from 1890, a month after her arrival – Sister Rose Gertrude presented, for the thousands of eyes that had accompanied her saga, her impressions of her first visit to Molokai, in the company of J. H. Kimball and George C. Potter, president and secretary of the Board of Health, respectively, Dr. Bradley, doctor of the war ship Mohican, and a reporter who traveled with her from San Francisco to Hawaii and who had been authorized to remain with the group. Also included in the group was someone to whom as of yet Amy had not given much attention, the young Dr. Lutz, “a student of Dr. Unna, of Hamburg.” The goal of the three-day visit was to gather information for an official report to be written for the Hawaiian legislature.

They left at ten o’clock in the morning on a stormy Wednesday and arrived in Kalaupapa around six o’clock in the evening. The town lay at the foot of the
majestic Pali, surrounded by incredibly high cliffs covered with lush, emerald-green vegetation – ferns, morning glories, banana and papaya groves, and **kukui** nut trees. There had been heavy rains in recent weeks, and the visitors counted fourteen waterfalls cascading from Pali’s rocky slopes.

The bad weather prevented the ship from reaching the shore, and as they waited offshore, a small boat filled with local residents came to the anchorage, supposing that the ship brought friends and relatives to visit them. When Amy and her companions put their feet on solid ground, they were greeted by cries of “aloha, aloha, aloha nui” (love, love, much love) – amid the strains of music played by a band that had hurriedly been called together to welcome the visiting authorities. “Amongst those drawn up around the landing-place,” wrote Sister Rose Gertrude (1889 [1890?], p.5),

were some with disfigured countenances, bandaged hands or feet, but all were bright and cheery-looking despite the pouring rain, and the disappointment at none of their relatives being in the boat.

Kalaupapa was a small village with three churches – one being Catholic, another Calvinist, and a third, Mormon – and a handful of whitewashed cabins with small gardens where bananas, sweet potatoes, taro root, and many flowers had been planted.

They spent the night at the house of Mr. Evans, the superintendent, and the following morning left early to visit an orphanage where 95 women of all ages were being cared for by six sisters of the Franciscan order of Syracuse. Amy was enchanted by their living quarters:

imagine the prettiest little cottage with green trellis-work and a verandah, clean and ‘home’ looking, furnished, though simply, with almost Parisian taste, by Mr. Reynolds, and you have before you the residence of the Sisters. In front is a smooth green lawn where the girls play croquet, surrounded by beds of lovely flowers such as we treasure in our green-houses in the old country.

The buildings were made of wood and included bathrooms, kitchens, classrooms, and dormitories. Their appearance was comparable to that of the best English hospitals but, there,

we had for the first time *le coeur serre*. There were girls of all ages and sizes, some with their faces eaten away by sores, others with the deep furrows that give them the appearance of old women of ninety or 100; others with finger-less hands and toe-less feet, and in spite of the spotlessness of the rooms and furniture, the cleanliness of their persons,
one involuntarily thanked God for blunting the senses of those forced not only to bear with them the body of decay, but also to live in constant and close contact with fellow-sufferers in more or less advanced stages of the disease. (p.6)

A carriage took the visitors to Kalawao, a village on another part of the peninsula where Father Damien had lived and died. In describing her visit to a young, refined Englishman, Rose Gertrude uses once again a narrative strategy common in her account: the contrast between interior scenes of decadence and human suffering, and the wonders of the natural world surrounding them: around the deathbed, the scent of jasmine, sunlight, and a soft breeze. The scene that the young nurse witnessed in that house led her to comment on the incredible lack of an infirmary for the critically ill:

And these poor creatures, entering the valley of the shadow of death, are surrounded by careless, unthinking friends, who are compelled, through no fault of their own, to pursue the noisy avocations of everyday life in the chamber of death: and the soul trembling on the brink of eternity, instead of being comforted by the loving messages of welcome of an infinitely merciful Saviour, is distressed and harassed by the jarring discords of common gossip and senseless jokes. (p.11-2)

At the foot of the same page, Sister Rose Gertrude asked for contributions to the project, suggesting that they be sent to Reverend H. Chapman, in London (177, Camden Grove, North Peckham), or to her account in care of the bankers Bishop & Co., in Honolulu.

They later visited the church in which Father Damien celebrated mass; his successor, Father Conrardy, took them to the Boy’s Home where there were 105 patients. “Here the same ravages of disease as those which struck us so painfully in the Girls’ Home, met our eyes.” Despite this, she was surprised to see that many of the patients ran and played merrily, “but when we think of the healthy English boy, running, leaping, riding and enjoying life, and building towering castles in the air for the future, can we help wishing to fill the lives of these poor, doomed leper children with bright surprises of toys, pictures, candy and books.” In addition to distributing the things she had brought from England, Rose Gertrude decided to leave the piano donated by Messrs. Broadwood & Sons “to entertain these poor orphans who truly feel an intense love for music” (p.10).

They then went to visit lepers in their own homes. Some were from important families and possessed beautiful, even luxurious houses. Others were poor and
Partial view of Kalawao, the village where Father Damien lived, on the peninsula where Molokai Leprosarium was built. On the back, the majestic Pali, which isolated the village from the rest of the island. Photo taken in the 1920’s by 11th Photo Section Air Service U.S.A. (Souza Araújo, 1929, ill. 36).

Molokai Leper Settlement. Partial view of Kalaupapa in the 1920’s. Photo taken by the 11th Photo Section Air Service U.S.A. (Souza Araújo, 1929, ill. 37).

Small road connecting Kalaupapa to Kalawao. On the right, the dramatic Pali. Photo taken in the 1920’s by the 11th Photo Section Air Service U.S.A. (Souza Araújo, 1929, ill. 38).
had small cottages they had received from the government: “Clean and comfortable they are too, but the people are in many cases too indolent to spend much pains in keeping them as nicely inside as they might do.”

In the house where Father Damien had lived and where his books still were, the brother who served as their guide showed them the hiding place in the roof where the holy man used to guard his money (p.11, 13).

Upon returning to Kalaupapa, they went around the edge of the extinct volcano, whose slopes were covered with luxurious vegetation. That extensive valley, protected from the winds by Pali, seemed to be quite fertile. Amy was charmed by the scenery along the way: delicate ferns; high, gracious shrubbery; gardens cultivated by natives, with bananas, yams, papayas, figs, and oranges; and children who played hide-and-seek amid the high relief topography. They saw many people on horseback, and the English nurse was informed that there were at least 800 animals for the more than 1,200 sick people who lived in the leper colony; thus, despite the confinement: “Those who cannot walk may enjoy this most agreeable exercise through the kindness of the Government” (p.14-5).

During that Thursday and for all of the following day, Dr. Swift, who was Molokai’s resident physician, and Adolpho Lutz were examining patients, and Amy was especially struck by the plight of Keanu, the condemned man who had traded the death penalty for inoculation with leprosy, which had finally developed and would soon take his life. The two doctors’ activities were mainly focused on children who had been born to parents who were lepers, with an eye towards transferring those who did not show any signs of the disease to Honolulu and other islands. In Dr. Swift’s office there was also a group of kokuas, healthy men and women who had obtained authorization from the Board of Health to care for the sick in Molokai.

Often it is a father whose children are lepers, or a wife who wishes to accompany a leprous husband. The kokuas are most anxious to be inscribed as lepers, so that they may not be sent back to Honolulu, but may obtain rations of food and clothing. (p.13-4, 16)

On Friday morning, in Kalaupapa, Amy’s group visited the small church and school for children with leprosy who lived with their parents, both groups under the care of Father Wendolen, an extroverted character who chatted with the residents in their own language: “Here, for the first time, a little leper girl, to whom we spoke, turned away her head as if ashamed to be seen.” Under the direction of a native teacher, the children sang for the visitors and seemed to Amy to be “bright and cheery” (p.15).
Saturday morning they left the leprosarium. As no ships would come into Kalaupapa that day, they crossed the Pali on horseback, by means of a sinuous trail recently blazed by the natives. In the highlands, the trail brought them past the house belonging to Mr. Meyer, superintendent of the leprosarium, “a lovely house in a bower of roses, passion-flowers and lilies.” The descent to the coast took more than two hours, and at ten o’clock that morning a small boat took them to S. S. Likelike, which would bring them back to Honolulu (p.17).

The Board of Health had control not merely over Molokai but also other hospitals within the kingdom of Hawaii, including the Receiving Station in Kalihi and the Kapiolani Home. This institution, named after the queen, was located in Kakaako, near Honolulu. Opened on November 5, 1885, it was intended to serve the daughters of parents who suffered from leprosy. It had fifty beds, but the number of patients was never more than 35. The girls who lived there were cared for by Franciscan sisters. (p.22)

Everyone who was suspected of being a carrier of the disease, Sister Rose Gertrude explains, was examined first by their district doctor. If infection were deemed a possibility, the patient would be sent to Kalihi, where Dr. Lutz would carefully perform another examination. Finally, a Board of Examiners would examine the patient one more time and make the final decision regarding his fate (p.18-9).

The receiving station at Kalihi occupied an area of about eight acres, surrounded by a double wooden fence that was eight feet high. The station was divided into two parts, one for lepers who would receive treatment from the Brazilian doctor, and another for those whose diagnosis was not yet confirmed. The “suspects” would be quarantined for observation, until they either manifested unequivocal signs of the disease, in which case, they would be sent to Molokai; or until they were cured, in which case they would be released. In order to prevent contagion, no contact was permitted between the lepers and the suspected carriers. A Chinese cook who did not have the disease prepared the food for both sections of Kalihi. Right in the middle, a wood-frame construction was being built to serve as chapel and school. It would be divided, with one side reserved for the lepers and the other for the suspected carriers. The second piano donated to Sister Rose Gertrude would remain there to accompany the children’s choir and the hymns sung during morning and evening services (p.19-21).

At the beginning of 1890, in the part of Kalihi station where lepers lived, there were 45 patients housed in independent wooden cottages. “[They] are
well fed and cared for, there is a native guardian, Mr. Charles Kahalehili, who is endowed with the tact, straightforwardness and activity, so necessary in his position of trust.” Other hospital buildings included a kitchen, a dispensary, doctor’s offices, an examining room, and a photography studio that Lutz had ordered prepared. Amy Fowler also refers to the “beautiful wood-frame cottage, surrounded by a verandah,” that the Board of Health had built for the sister who would care for the establishment.

That ingenuous English girl, still filled with a missionary zeal to relieve the sufferings of those at Molokai and the sins of all, by giving all that had been presented to her during her voyage in terms of donations of money and goods, saw Kalihi as a charming, healthful station near the seashore, surrounded by graceful mesquite, ready to be transformed into a “lovely little Garden of Eden,” with the growth of the fruit trees, ferns, and flowers that the North American president of the Board, John Hancock Kimball, intended to plant there. Molokai also seemed to be, for those who were not at advanced, painful stages of the disease, “a dreamy, lazy arcade – a land in which, if not ‘manna, bread, and honey’ at least yams and fresh meat are at one’s fingertips” (p.19-20, 16).

Judging from the information gathered by Law (n.d., p.3), until her arrival in Hawaii, the English nurse did not know that Molokai was already a Franciscan territory, and she became extremely disappointed when the Board of Health put her in charge of the Kalihi Receiving Station. There, her dreams were quickly shattered, and the life of Amy Fowler took a turn that most certainly was not part of Sister Rose Gertrude’s plan.

The therapeutic project of Adolpho Lutz

In a report submitted to the Hawaiian legislature at the beginning of 1890, John Hancock Kimball wrote that in Kalihi everything was working in a way that was entirely satisfactory to the Board ... A limited number of patients, not to exceed twenty, who are disposed to obey the rules and regulations necessary for their governance, has been chosen by Dr. Lutz to be placed under careful observation and care. (cited in Corrêa, 1992, p.148)

In his first report to Kimball, in April of that year, Lutz described the state of the twenty patients and the first results obtained from his treatment.
Map of Oahu Island. On the southern coast, near Honolulu, the peninsula called Diamond Head, where Kalihi Receiving Station or Kalihi Hospital used to be (Whitney, 1890).

Partial view of Kalihi Leper Hospital, when it was already a U.S.A. institution. Souza Araújo’s photo, from his visit to Hawaii in the 1920’s (1929, ill.19).

Kalihi Leper Hospital central pavillion. Souza Araújo’s photo, from his visit to Hawaii in the 1920’s (1929, ill.23).

Kalihi Leper Hospital. House for ten patients. Souza Araújo’s photo, from his visit to Hawaii in the 1920’s (1929, ill.25).

Kalihi Boy’s Home, which sheltered boys that were segregated at the time of birth in order to avoid contagion. Souza Araújo’s photo, from his visit to Hawaii in the 1920’s (1929, ill.25).
“Leprosy is a chronic disease, like syphilis and tuberculosis, and therefore requires chronic treatment, just as they do,” he wrote. A study that had been recently done by Hawaiian authorities in collaboration with leprologists from around the world (Hawaii, Dept. of Foreign Affairs, 1886) showed the results obtained up until then to be uninspiring. Nonetheless, Lutz seemed convinced that he would be able to cure the disease, just as a cure had been found for syphilis, which, by the way, also afflicted a large number of his patients. (As for tuberculosis, there was still no effective treatment, just spontaneous recovery facilitated by rest, hygiene, and good nutrition.)

During Lutz’ first three months of work, the supply of drugs he had brought from Germany were nearly used up, since he was unable to find what he needed from the druggists who supplied the Board of Health. The treatment was giving better results in cases of tubercular leprosy, especially in the initial stages of the disease. Lutz observed that the erimatose blotches characteristic of other forms, so similar to psoriasis and so often confused with it, could be eliminated with external treatment. His treatment proved to be less effective when muscular contraction and atrophy were combined with loss of sensation. The results were also unconclusive when there was hypertrophism involving connective tissue similar to elephantiasis. “It is likely that some of these symptoms (especially when they have already persisted for many years) are unable to be cured perfectly, since some anatomical changes do not permit restitutio ad integrum.”

The microorganisms present in the tumors that developed in the bodies of the sick were probably inactive, but it was impossible to rule out the possibility that, with the re-absorption of dead material favored by the use of topical medications, active microorganisms could return into circulation. Because of this, Lutz put a priority on systemic treatment. The earlier the diagnosis, the more effective it would be, so it was important for the doctors of the Hawaiian islands to learn to detect the disease sooner.

Of the substances for internal use, the main one was chaulmoogra oil, an extract made from the seeds of plants native to the Indo-Malayan region, of the genus *Hydnocarpus*, in the Flacourtiaceae family. Ancient Buddhist texts contained references to the consumption of these plants by lepers. In Japan and India, they had already been in use for centuries when, in the nineteenth century, the British brought information about their use back to the European medical community (Coutinho, 157, p.319-21; Murray, 1910, p.864; Benchimol et al., 2003, p.361-96). According to Obregón (n.d., p.164-5), chaulmoogra oil
Several seeds of chaulmoogra plants (Em. Perrot, Le Chaulmoogra; in Jeanselme, 1934, ill. 259, p. 630).

and its derivatives, administered orally or hypodermically, were the only treatments available and reasonably effective until 1942, when Promin, a sulfone derivative developed by Guy H. Faget, was introduced.

Fighting the side effects, especially nausea, until a dose of at least 2.8 grams three times a day was achieved, Lutz was able to maintain his patients in a good general state of health. He also used gynocardic acid, the active ingredient in chaulmoogra, prepared by Merck, until the supplies he had brought from Germany ran out.

During a yellow fever epidemic in the Brazilian state of Campinas the previous year, Lutz had liberally used salol, a combination of salicylic and carbolic acids. He had also used sodium salicylate, although elevated doses of it could cause disagreeable, even alarming side effects. Believed to be good as antiseptics and for reducing fever, they were administered internally for joint rheumatism and intestinal and urinary infections; externally, in powder form, they were used in treating a variety of wounds.

Sodium salicylate, a derivative of salicylic acid (a forerunner of aspirin), was widely utilized against various infectious diseases, including yellow fever (Benchimol, 1999). Lutz had already tested another medication on two lepers treated in São Paulo. With daily doses of 6 to 8 grams, fever was reduced and acute eruptions were halted, and both patients were in good health for the next six months. The use of these acids made it possible to foresee favorable effects on leprosy “due to their anti-fermentation action in the blood.”

Vegetal creosote, extracted from beech trees, was highly recommended for the treatment of consumption, and was also used for leprosy. The most active ingredient of this compound, guayacol, was used in the treatment of pulmonary tuberculosis and as a local antiseptic. Lutz began to use the 100 grams of the pure preparation that he had brought, but he still lacked the elements for evaluating its effectiveness.

In the symptomatic treatment of severe neuralgic pain, antipyrine was giving good results.
Carpotroche brasiliensis Endl., known as sapucainha, a Brazilian chaulmoogra species, which was studied as an anti-leprosy plant by Theodor Peckolt (1861-69). Original plates in Martius, *Flora Brasiliensis* (v.13, part 1, ill. 88; 1841-1872), reproduced in Souza Araújo (1946, v.1, ill. 28).
Since the combination of leprosy and syphilis was very common in Hawaii, Lutz administered iodine and mercury to his patients, although many authors warned of the toxic effects of these substances. He paid particular attention to the effectiveness for leprosy patients of potassium iodate, which was used to treat tertiary symptoms of syphilis. Arsenious acid did not give favorable results and had been discarded.

Two other substances were part of Lutz’ therapeutic arsenal. The first one was goldenseal, an herb of the Ranunculaceae family, especially the species native to North America (*Hydrastis canadensis*). One of the alkaloids contained in its rhizome, berberine, produced strong contractions in the uterus and for this reason was used against uterine hemorrhages. It also had tonic, fever-reducing, and diuretic properties. The second substance was *Veratrum*, which was also derived from various herbs of the Ranunculaceae family that contained verathrine combined with other alkaloids. It was often used to induce vomiting and as a purgative; applied externally, it gave good results in a number of cutaneous diseases (Littré & Gilbert, 1908).

Of the medications used externally, the main one was chrysarobin, an extract made from Goa powder, a vegetal detritus found in the hollow trunks of angelim-araroba, a Brazilian tree. The substance had begun to be used in Brazil against various skin diseases and soon was adopted by European dermatologists, becoming the unrivalled external medication for treatment of psoriasis. Unna was the first to call his peers’ attention to the fact that chrysarobin could make leprous tubercles disappear, especially old ones. Lutz thought it possible to obtain the same result for maculo-nervous eruptions, especially the blotches similar to psoriasis. Pyrogallic acid (C$_{12}$H$_6$O$_6$), obtained by distilling gallic acid, acted in a similar manner, although more slowly. The external use of iodine and hydroxylamine were still *sub judice*. Lutz was also unconvinced that strychnine, tannic acid, and ichthyol were of specific value for leprosy as external medications, although the latter was useful for inflammatory symptoms when applied topically.

**The crisis**

Adolpho Lutz’ therapeutic project, which had initially seemed so promising, abruptly ended some months later due to a crisis that proved the end of the idyllic scene painted in February by Amy Fowler. According to Corrêa (1992, p.150-1), the crisis developed in August, 1890, when Charles Kahalehili, who
suffered from Hansen’s disease and who worked as administrator of Kalihi Station, was reprimanded by Amy because of “malicious comments made in the presence of others about two patients’ psychotic symptoms, attributing the cause of their psychosis to the medication used by Lutz.” Kahalehili went to the Board of Health, which named an investigative commission. Questioned aggressively, Lutz “deplored the offense and showed that a simple request for information would have clarified the matter.” The Brazilian doctor and the English nurse then resigned from their positions at Kalihi.

In *Lutziana*, Bertha Lutz’ version is different. According to her, her father made the decision to resign, as other doctors had done, because of “interference from lay persons.” A white man who was having a love affair with an indigenous woman was brought in as a leper by his brother, a missionary who Lutz detested, and who had no scruples about resorting to such a measure in order to quell the scandal. Having verified that the indigenous woman’s lover did not suffer from the disease, Lutz proposed to the Board of Health that he be released. The missionary pressured some of the board members, and when the Board met and voted on the issue, Lutz’ suggestion was defeated. Indignant, he resigned in protest, as did Amy Fowler.

The unhappy man, brother of a missionary so eager to save his soul and put an end to his *mésalliance*, committed suicide. At this, some of the major newspapers of the United States appeared, requesting interviews with Dr. Lutz. He did not consider it ethical for a doctor to discuss hospital affairs with the press, and refused. Mrs. Amy Fowler, however, gave the interviews and the case was clarified, as it should have been.

The proud resignation letter written by Adolpho Lutz to the Hawaiian Board of Health, on September 3, 1890, less than a year after he had arrived in the Hawaiian islands, is transcribed in its entirety by Corrêa (1992, p.151). It seems to confirm the first version of the incident. Written in a harsh tone, it gives no room for negotiation.

You will remember that in accepting my position with the Board of Health, I was careful not to bind myself to any given time. As my task could only be carried out if I found the necessary support where I had the right to look for it, I desired to provide for all emergencies. I am now satisfied by public facts that as a body, you not only refuse that support, but show yourselves very slow, if not absolutely reluctant to do even common justice, sanctioning by your silence the disgraceful conduct of an inferior employé. After that, I think it unnecessary to enter into the numerous indiscretions and indelicacies, as well as the system of
spying and reporting which the President and the Agent of the Board of Health seem to consider necessary to the fulfillment of their duties; nobody familiar with the circumstances will be astonished to learn that I refuse to go on exposing my life and my health meeting with such unfair treatment. If I have not resigned long ago, it is only because I would not have my resignation misconstrued; the unanimous vote of sympathy from all my patients satisfies me that my endeavours have been recognized where I most cared that they should be. I shall therefore give up my position as physician of the Kalihi Hospital at the end of the month at the latest, presuming that this time will suffice for my further arrangements. I expect retribution for my expenses for drugs and instruments, brought for and sent for from Europe, as well as of the sum stipulated as compensation for my journey home.

It is possible that the two versions – that of the punishment of a problematic subordinate and that of an influential missionary – may be connected by a more complex web of events, including the anti-contagionist opinions that Lutz expressed in an article suggestively entitled *Leprophobia*, published in *Journal of Cutaneous and Genito-Urinary Diseases* (1892) and in *Revista Médica de São Paulo* (1898).

In reality, there were two investigative commissions. The one named by the Board of Health seems to have taken an ambiguous position, deferring the punishment of Charles Kahalehili, who had not merely sabotaged Lutz’ treatment but had also spread malicious rumors about the relationship between the doctor and the nurse. Indignant with the Board, especially when she discovered they wished her to resign, Amy went to the legislature, which named another commission. The depositions made during three visits by legislators to Kalihi Receiving Hospital (August 15, 16, and 18, 1890) showed that the crisis really had been provoked by a more complicated situation.

During the first session, besides the legislators and the witnesses, those present included Mr. Carter, of the Board of Health, C. B. Reynolds, the Board’s representative in Kalihi, with authority over Charles Kahalehili, and Kahalehili himself, the *de facto* manager, or *luna* as the native patients called him. The stenographer for the sessions was the reporter D. Logan.

In the beginning, one by one, the three complaints made by Sister Rose Gertrude against Kahalehili were read, as were the Board’s responses and the statements made by the accused, but the stenographer only registered occasional comments by the English nurse, which confirm that there were complaints but do not permit us to know their exact content. Only a reading of the depositions in their entirety reveals what the conflicts were.
Provoked by the representatives of the Board of Health, Rose Gertrude explained why she had appealed to the legislature: “Mr. Carter and Mr. Waterhouse came out to investigate my complaints ... I was told that Mr. Damon went to the Roman Catholic Bishop, and gave him to understand that the Board wished me to resign. That was the only answer we received after this committee was here ... I considered it an insult to doubt my word and the doctor’s against that of a man like Charlie ... In England in any hospital, if a charge was made by a matron or physician against any servant he would be dismissed at once (Hawaii, Legislature, 1890, p.2, 7).”

“This is not England,” Carter protested. “We are bound to conside the rights of this Hawaiian. Why did you not complain about these things before? These things were going on for some time?”

Amy responded that she had done so, to Reynolds, who took the side of Kahalehili, saying only, “You cannot expect much from a native.” She had also spoken with the British commissary, but unofficially (ibid., p.7-8).

Relations between Amy and the president of the Board, Dr. Kimball, had also been strained for some time. The English nurse had told him that the patients felt humiliated when he exhibited them to the visitors that he frequently brought to Kalihi. Kimball responded that he knew Hawaiians better than she did, whereupon Amy retorted that this might be true but she knew her job. “Very well, since you have taken that line with me,’ Kimball replied, ‘I shall treat you as you deserve: when I come out here I will ignore you’, and he has; when he has brought visitors out he has not spoken to me.” During the depositions, one of the patients, Reverend Pahio, confirmed, “It is very disgraceful; we do not like to be brought up and exposed to everybody” (p.22).

The professional conflicts at Kalihi had become impossible to negotiate, and even Carter made a point at declaring that “the Sister and the Doctor both said to me the other day that their positions were not sufficiently defined, and I reported to the Board, and regulations are now being drawn up to allot each officer’s place” (p.8).

The most important complaints have to do with Kahalehili sabotaging Lutz’ treatment and the doctor’s and nurse’s authority. This sabotage, done with the complicity of members of the Board, brought to the surface other condemnable aspects of the hospital administration. The patients lived in constant fear of being sent to Molokai, and the administrators – the luna and Reynolds – manipulated this fear in order to obtain personal favors and free
labor, even with patients whose health was poor and whom Lutz and Amy felt needed to rest.

John Francisco, one of the patients called to testify, stated that Charlie Kahalehili “treats us kind of rough ... He says, ‘If you do not go to work you must go to Molokai.’ ... I worked for four weeks. I told him, if the Government wants me to work it must give me clothes.” The legislators asked if the Board had not provided all that he needed. “I got a blanket and a mattress, that’s all,” John Francisco responded. He confirmed Amy’s complaint that Mahiai, a patient who was extremely ill, had been forced to paint fences when he had a fever, and when Lutz had ordered him to remain in bed (p.10, 12).

Another of the Brazilian doctor’s patients, a young woman of delicate health named Luaka, said that Charlie required her to wash clothes “without pay and he has at times told me that if I didn’t wash his clothes he would send me to Molokai.” Once, she confessed, he said angrily that “he wanted to wash out the stains of the doctor’s medicines that had been rubbed on his body” (p.12-3, 40).

The patient Dreizehner gave eloquent testimony on this subject: Kahalehili “was a boss here, and if he told anybody to go to work they were all afraid.” He cited the example of Puniae, a kanaka carpenter who was made responsible for finishing the church.

I am sure they worked from six o’clock in the morning till seven at night. One evening I came along and Puniae was working very slow on the church, and I asked him why he didn’t lay off, and he said, ‘We cannot because Charlie will send us to Molokai.’ And he told me that the doctor told him not to work, and when he told Charlie, he said: ‘It is no use, the church must be built’ ... . The man is nearly all the time sick, the doctor has to be patching his hands and his feet ... There is another man in there sick and I will say something for him. When he came here first he was very sick and the Sister did a good deal for him. He had to go out, when he was a little better, with the dumping cart digging sand and dirt, and would be getting up and lying down again ... I think when a man is sick, working out in the sun and then going into the cold water, it is not good for him. He had not been seen for sometime and I found he was sick. He was lying there for fourteen days ... on a mattress not thicker than that (shows) nor longer than that (shows), for a man six feet in length ... I do not speak for myself but for these other people. I go into that yard and ask where they got this or that, and it is the Sister everything – bits of tobacco, money, etc. I have nothing against Mr. Reynolds ... but when people are taken from their homes something should be done for them. What would the place be without the Sister ... Sister complained to me that she must do something, that she could not stand it much longer, and I said, what is the use, this country has no more mercy for a leper than for a dog. (p.27-9)
These accusations made it evident that there was a serious problem in terms of the standards of care for quarantined patients, both those who were out of the hospital as well as those within (who should have been separated into those who were already sick and those who were suspected cases). Charlie was a leper, but spent most of his time on the side reserved for the suspected cases, among whom were included the young woman who he made wash clothes. A number of those who testified accused him of eating with these patients, and one of the complaints made by Sister Rose Gertrude even referred to his frequent forays out into the city (p.8).

The neurologic issue was the opposition made to Adolpho Lutz’ treatment, which, in the opinion of a number of those who testified, was similar to that of a kahuna, a faith-healer. Amy accused Charlie of speaking “against the doctor and against me... that the doctor did not know how to treat the patients and ... that a patient was made crazy by the medicines, which I administered” (p.3).

Various patients confirmed this. “I heard Charlie say it was useless to take medicine, it was better to pray,” Mrs. Johnson declared. Miss Harper also heard from Kahalehili that Lutz’ medicines had made one man go crazy. Reverend Pahio stated:

He had no confidence in the doctor's medicine ... what he said was the cause of preventing people from taking the medicine ... he acted like most Hawaiian kahunas in going and sprinkling water on this girl Halimaile (this woman has gone to Molokai). Charlie came to me and asked me for a Bible ... he never did anything with the Bible except this water business ... This girl appeared to be out of her mind, as though she had a spirit that had visited her and he was acting as though to drive this spirit away from her according to the manner of a kahuna. (p.14-5, 19-20)

The man who had gone crazy was from the Fiji Islands. He lived on the side of the suspected cases and ended up dying. According to John Franscico, “he was quiet at night, but if Charlie came in he would become very violent.” The luna had made him go “into the sun although he knew it was against the doctor’s orders and he knew he was nearly dying.” John Francisco took care of him on the night that he had one of his episodes and began to scream.

Sister... telephoned to Dr. Lutz ... doctor stayed here all night to keep him quiet – gave him medicine. One night, two nights after that, I was in the sick man’s room. Charlie came up with two coils of rope and a pair of handcuffs ... Sister came along and asked what he meant by that.
Reynolds intervened and asked the English nurse: “Didn’t he (the Fiji Islander) get a pair of scissors and require three or four men to quiet him?” “No,” she replied, “I got him to come out by my own persuasion; didn’t I, John?” (p.4, 10).

The incident is related by Bertha Lutz to demonstrate her mother’s courage.

One day a patient, made desperate by having been separated from his family, decided to commit suicide. Taking a long scissors that Lutz used for cutting paper, he locked himself in his room. Sister Rose Gertrude went to his door and asked, ‘My son, did you take my scissors?’ ‘Yes, I am going to kill myself.’ She replied: ‘But no, you can’t do that. Your family will be very sad. Give me the scissors, I need them to cut paper.’ ‘Then come in and I will give the scissors to you.’

Everyone insisted that she should not enter the room, but she calmly opened the door and went in. The patient picked up the scissors and offered them to the nurse, who thanked him and left. The incident had ended. (Lutziana)

The depositions collected by the legislative commission indicated that Lutz’ treatment had been popular among the patients at Kalihi. Pahio declared:

I can now show you why I have faith in the doctor’s medicine. I consider that I was one of the worst patients that was in this yard – my forehead was covered with lumps, and the lobes of my ears were enlarged, my face all puffed out, my arms in a horrible condition... you see what condition I am in today. Therefore I place the most implicit confidence in the doctor’s medicine.

The reverend affirmed that various other patients had also improved. “The doctor ... removed them to the suspect yard, so that as soon as they are cured he can release them” (ibid., p.21).

The report made by four of the five members of the legislative commission concluded that the accusations against Charles Kahalehili were true. On their last visit to the hospital, they called all the patients and asked each one, separately, how they were treated by him and if they wanted him to continue as the Board’s agent. A unanimous “no” was the answer. They then recommended that Kahalehili no longer be permitted to hold any sort of role in the hospital administration. As he had been acting on instructions from or tacit approval from Reynolds, they also considered that he too was unfit to serve as agent of the Board of Health.

From the evidence it was satisfactorily proved ... that undoubtedly Dr. Lutz is the only suitable person to be in charge of the medical treatment
of the people affected with this disease ... It was represented ... that all the Hospital had great confidence in Dr. Lutz’ treatment of the disease, and your Committee believe that if there are no obstacles placed in Dr. Lutz’ way that he may succeed in curing some of the cases ... as many of them already show great improvement.

The commission also observed that the patients had “great confidence in Sister Rose Gertrude who ... takes care of them as a parent would a child; and they both love and respect her.” Lutz should have full authority over the patients, and Sister Rose Gertrude, total control over the hospital, under direct supervision by the Board of Health. The commission also recommended that there should be two sets of staff, one to care only for the suspected cases and the other to care for the confirmed cases and those whose illness was advanced.

Kimball left his role as president of the Board of Health and on September 10, 1890, his successor, Dr. David Dayton, asked Lutz and Amy to reconsider their decision to leave Kalihi, but they no longer wished to stay.
The events that led to this can be understood as being part of a larger set of tensions involving hygiene agents and the population that was subject to the draconian law of 1865, which resulted in the segregation of thousands of carriers or suspected carriers of Hansen’s bacillus. In 1885, the transfer from Molokai to Honolulu would bring a desperate father to kill two policemen and to wound a third. In 1890, in a village called Kailua, Kealoha reacted with gunshots against the police who came to take him away. According to Mouritz, between 1865 and 1895 there were at least a dozen similar episodes. During the period when Lutz and Amy were in the islands, a “cleansing” of the island of Hawaii was conducted, resulting in the reclusion of about 400 people. A sheriff wanted to do the same thing on the island of Kauai, but when he went to hunt down the lepers of the village of Kalalu, armed to the teeth, an indigenous man named Koolai shot him and fled. The government sent 25 soldiers in pursuit of him. Koolai ambushed them in a valley, with a Winchester and a lot of ammunition and the soldiers took off running. He was never caught, but it is known that he died of the disease five years later. The most serious episode occurred in July of 1893, and became known as the “war of the lepers of Kauai.” In a social context of latent civil war that would lead to the deposition in 1894 of Queen Lydia Liliuokalani (2.9.1838 – 11.11.1917) by foreigners who wanted to annex the island to the United States, the Board of Health ordered the destruction of a village of lepers in the Kalalaul valley, where they had been fed and cared for by relatives and friends (Souza Araújo, 1929, p.96-7).
Testimony of dr. Lutz
(Hawaii, Legislature, 1890, p. 22-6)

Q. – Did you ever have any trouble here with the patients?
A. – No; I have had no trouble so far as I know.
Q. – With the Sister?
A. – No.
Q. – With Charlie?
A. – I have had no direct trouble of any importance till lately, I have had some difficulty.
Q. – Who has charge of this hospital?
A. – I was told when I came here that I had nothing to do with the administration except so far as medical matters are concerned. I think there has been a want of definition on this matter. I have not received any written or printed instructions about that.
Q. – Who do you consider is in charge of the place, the Sister, or Charlie, or Mr. Reynolds?
A. – I consider I have charge so far as medical administration is concerned — I am house physician — in my absence the Sister is in charge. In some matters I consider Charlie is in charge. Then I understood that Mr. Reynolds is in technical charge of the place, such as looking after the necessaries of the people etc.
Q. – Would you consider Charlie a trustee, or manager, or director, or what?
A. – I was told when the Superintendent was discharged that we were going to do without a superintendent. I understood Charlie was employed to look after the place. It was told me it was a matter of economy. I have never been consulted about any such question. I have not cared about it because I could not be here all the time, I could not take the responsibility.
Q. – Who told you?
A. – Dr. Kimball.
Q. – That to save expense?
A. – Mr. Gibbs would go out and Charlie would take charge to see that the doors were shut etc.
Q. – What do you consider Mr. Reynolds’ position?
A. – As I said, that he has technical direction.
Q. – You do not have charge of all the patients then?
A. – I have picked out my patients. I have the right to twenty patients on the other side, on this side none. I would ask patients if they wanted treatment or they would ask me. All were free to choose whether they took the treatment or not. Nobody was obliged to take medicines or not. I was told that the people would be willing to take treatment. When some were here for a long time and needed medical help, I attended to them. There was no obligation on me to treat them but it is an absolute necessity for somebody to treat them. For instance, we had a man here the other day with a gangrenous finger, and he would have died if he had not proper treatment.
Q. – Do you give the medicine yourself?
A. – No; they are given by my directions.
Q. – Who gives them—Charlie?
A. – No.
Q. – Carter?
A. – Yes. We have been here for a long time in a promissory state. I was told when I came here that there was only small appropriation and we must get along in an economical way.
Q. – What would you consider would be a necessary appropriation for medicines for this hospital?

A. – Well, that is a question that might be postponed to another occasion.

By Mr. Reynolds. – You state that you do not know who is the executive head of this establishment. Since you came here you have had considerable work done, you have had an office fitted up. Did you ask Charlie or the Board of Health to do it?

A. – As I said, I considered Mr. Reynolds had the technical direction of the place. I have never had the slightest trouble. The only trouble was if a case of insanity occurred. I would like to have known who had authority to deal with it.

Q. – What did you consider the physical condition of Charlie, as to whether he could give contagion to anybody?

A. – I think if he is allowed to go out anybody about this yard ought to be allowed to go out. I wanted to speak to you several times about this, but never found it convenient. If I had been asked I should have held that he had no right to go out.

Q. – Do you consider it more dangerous than for Mrs. Johnson to go out?

A. – Most decidedly. Mrs. Johnson’s case is so slight that she ought to be in the suspect yard. I have been asked if she could go out to a funeral and I said she might.

Q. – What do you consider the condition of suspects in this yard, whether they are lepers or not?

A. – I decline to answer on that point at this time.

Hon. Crabbe. – This has got nothing to do with this case.

Mr. Reynolds. – Charlie is my deputy and I am responsible for him. Are they any worse than the case of Bruns, whom you kept secreted in a house for eight days?

A. – I declare that the statement of Mr. Reynolds is false and that I knew nothing about this case before the boy came here. You know it is false!

Mr. Reynolds. – I do not know it, because I had it from his father.

Q. – Would you consider that it is right for Charlie to go into the suspect yard and eat with the people there?

A. – It is a question entirely of the regulations. My opinion has nothing to do with it. If there is one patient here who is not absolutely certain to be a leper, no one from the other side ought to be allowed to come in here. The question I want to come to is whether he was undermining my authority secretly while he was professing to be benefiting from my treatment — acting in an entirely false manner — apparently willing to take my medicines — saying that a manic patient was so because of my treatment, and making a patient work contrary to my direction. If those things are proved the consequences are certain — the man cannot hold his position or I cannot hold my position. And if not proved, I want to know how they are not.

Q. – Your information is only from hearsay?

A. – Yes, but I have had from several. As to the question of persons who have become insane, one of them is still so in Molokai. No one ever heard of medicines producing chronic insanity. No one here is compelled to take anything he doesn’t like to take. I tried to be always humane in my treatment, and I compel no one to take anything he does not want.

Q. – When you are out here and ask Charlie to do anything, will he do it or can you compel him?

A. – Yes; I have never had any difficulty that way. He is always willing and affectionate.

To Sister Rose. – Has Charlie ever refused to do anything you told him?

A. – No; he has always been good that way, only the time I told him not to handcuff the Fiji islander.
The Calm

Until September of 1890, Amy lived at the hospital and Lutz in the center of the city. Bertha, who was their first child and who would be born a few years later, remembers that her mother told her that

when she would do her shopping in Honolulu, everyone knew her and the merchants received her very well, but everyone begged her not to touch the merchandise. They opened their wares and showed her everything she wished to see, but did not want her, under any circumstances, to touch the things she planned to buy until after she had paid for them. (Lutz, Lutziana)

According to Bertha Lutz, what drew Sister Rose Gertrude to the Brazilian doctor was his fearlessness about his risk of contracting the disease, and his consequent affection for and closeness to his patients. Other doctors

did not hide their repugnance for examining the lepers, while he was completely natural and warm with them, as though they were ordinary patients or personal friends. She soon followed his example, and during the time that she was in the ... leper hospital, she never avoided contact with them and never contracted the disease. This situation, which both faced with great courage, could not have failed to bring them together. (Corrêa, 1992, p.150)

As we have seen, their friendship proved fodder for the malice of Kahalehili and others in the hygiene department, especially the habit they had of taking long rides on horseback during their free time, when Amy used secular clothing instead of the nun’s habit (Law, n.d., p.4). Dreizehner, one of the patients who testified before the legislative commission, made an interesting comment: “Sister complains that she has been insulted, and she has been insulted. Now, there is one man from South America who saw that the Sister needed help, and he has helped her – he has been behind her all the time just like a dog” (Hawaii, Legislature, 1890, p.29).

In his private practice, Lutz had mostly European patients who were residing in Honolulu, “including many Portuguese.” He had very good relations with a German family and with a Chinese man who had great influence over the community of foreigners. The English nurse also began to be part of this circle of people who were not afraid of contact with people who lived among lepers. According to Bertha Lutz, they had good relations with the native elite. As an illustration of this, she cites a note sent by Kapiolani, the Queen of Hawaii, to Lutz when one of the young woman of her court was examined by him. She
would have said: “I greatly fear what I already know will be your diagnosis.” And, in fact, the girl did have leprosy. “My mother spoke of the queen’s great courteousness and of how she sometimes gave my mother plants that did not grow in England for her little garden” (Lutziana).

The only people with whom Adolpho Lutz did not get along well were the missionaries

who wanted to convert the natives, the kanakas, but who did things that seemed to have little honesty, such as trading large expanses of land for small trinkets and punishing them for minor infractions. Dr. Lutz used to say that some of the large fortunes of the archipelago’s well-known families had origins that it was better not to think too much about... (Lutz, Lutziana)

The crisis we have related here brought the Brazilian physician and the English nurse together, despite differing views of religion. But Lutz’ Germanic formality and the decorousness of the young woman who had been brought up according to strict Victorian manners did not allow the two to permit subside the sentiments that each held for the other, and which certainly they were unable to mask as they carried out their daily responsibilities. At the invitation of Mr. Liu, the Chinese man who was so influential in Honolulu, Amy went to
stay at the house where he lived with his family while she waited for her return to England. Days before her voyage, the young Brazilian physician asked for her hand in marriage. In Bertha Lutz’ narrative, (Lutziana), the marriage took place on April 19, 1891, in Honolulu, at the Chinese family’s home, with a bucolic altar that had been put up in the garden and decorated with wreaths of flowers. However, according to the documents consulted by Corrêa (1992, p.149-50), Lutz and Amy were married on April 11, at the home of H. M. Schmidt –probably the head of the German family that had opened their home to Lutz – in a simple ceremony celebrated by a pastor of the Church of the Central Union of Honolulu, with Schmidt himself, J. Ena, and G. Woodhouse, the English consul, as witnesses.

The couple remained in Honolulu for a little over a year, until the middle of 1892. Lutz maintained his private practice, and continued to treat a few cases of leprosy in Kalihi and Molokai, refusing, however, the insistent invitations from the Board of Health to reassume his post. Amy maintained contact with people she had met at Kalihi after they had been sent to Molokai. In 1891, she used part of the money that had been sent to her from England to build a library in Kalaupapa which was given the name of Beretania Hall (Law, n.d., p.5).

One of Adolpho Lutz’ favorite pastimes was making excursions around the islands to study their flora and fauna, and it is possible that Amy accompanied him on these trips. He published important papers in Monatshefte für Praktische Dermatologie (Sept.1891-Aug.1892), continuing to contribute during the second half of 1892, when the couple moved to San Francisco, California. In one of these letters he describes, for the first time, juxta-articular nodules, which would be later studied by Jeanselme, “as something new” (Neiva, 1941, iv; Portugal, 1944), and which today are known as Lutz-Jeanselme nodules.
In this 1890 photo, a tramcar of The Hawaii Tramways Company stops in front of Aliiolani Hale on King Street, Honolulu (Hoefer, 1985, p.49).

Residence of Honorable C. R. Bishop, probably the owner of the bank where Amy Lutz made her deposits (Whitney, 1890).
In Hawaii, Adolpho Lutz continued his studies of parasites in humans and domestic animals. Biographers put an emphasis on his work on hepatic fluke worms and their sources, which led him to study the snails that lived in different parts of the islands where sheep were raised. These studies would prepare him for what Deane considers (1955, pp 80) his major contribution to medical zoology in Brazil: “his masterful works on *Schistosoma mansoni* and the mollusks responsible for the propagation of eschistossomosis,” studies begun in the first decade of the twentieth century, at the Instituto Oswaldo Cruz.

Albuquerque (1992, p.13) pinpoints Hawaii as the place where the basis was made for another important later discovery by Adolpho Lutz: the realization that plants that retained water served as habitats for small crustaceans. This would later direct his attention to role of this habitat in the transmission of malaria in the wild.

According to a paper by the Centenary Commission on Lutz (1956, p.9), it was also in Hawaii that Lutz began entomological observations that would serve as a basis for his later activity in the area of sanitation. We will see that he already had formulated a hypothesis that leprosy was transmitted by mosquitoes. For Albuquerque (1950, p.13-4), this conviction would become stronger over the years, but was a result of the following observations made in Hawaii:

Although he had never avoided direct contact with the lepers, he had not caught the disease, nor had the young nurse in whose tender arms many of them crossed the doorways of life into death. However, among the sick who entered the settlement, many had never before seen another leper. There had been a time, and not so long before, when neither leprosy nor mosquitoes had existed in Hawaii. The native language had no terms designating either ‘leprosy’ or ‘mosquito’, and it dubbed morphea ‘the Chinese disease’ since it had only appeared with the arrival of the Chinese and their rice-growing. This crop was, as customary, grown in ditches irrigated constantly with water, where mosquitoes, also coming from abroad, found an excellent microhabitat.

**Lutz’ theory of the transmission of leprosy by mosquitoes**

Lutz’ first speculation on the role of blood-sucking insects is found in “Estudos sobre lepra” (Studies on leprosy), written in Limeira in 1885-86 and published immediately afterwards, during his first stay at Unna’s clinic in Hamburg, in Monatshefte für Praktische Dermatologie (1887). In describing the primary lesions of nerve leprosy, which could be an “entryway to infection,”
Lutz deemed it “remarkable that the first location of nerve leprosy occurs almost always in those parts of the body kept uncovered and exposed to insect bites and other traumatisms” (p.549).

As to transmission of the disease, Lutz analyzed the inconsistencies in the theory of heritability and although he was already fascinated by Hansen’s bacillus, his stance differed from that taken up by proponents of the new microbial paradigm:

> from my observation of the disease, I have no hesitation in stating that leprosy is less contagious than tuberculosis and in labeling the brusque expulsion of lepers from the heart of society ... as not only inhuman but also hardly efficient and, moreover, incoherent: and this because leprosy offers no greater danger to life than tuberculosis, nor are its prospects for a cure any darker.

Infection of each new case depended upon the pre-existence of another, within a certain period of time, but “the conditions necessary for a new case to appear are so complex and singular that only rarely will they be met within the immediate vicinity of lepers.”

Seeing leprosy with the eyes of a parasitologist, Lutz proposed an analogy with ancylostomiasis, the topic of a study he published in Leipzig around the
same time. Like leprosy, ancylostomiasis presupposed the existence of other cases but

someone who lives in a country where hookworm is found can contract the disease from muddy water without ever having come near someone suffering from it, while living in contact with the ill can be totally harmless, as long as rigorous cleanliness is observed regarding drinking water and wastes.

Lutz believed leprosy was “a disease for which only very rarely [would] direct transmission be demonstrable and in which for this very reason infection by contact within the family household plays merely a minor role.” In his opinion, congenital transmission played a “wholly insignificant” role and morbidity was maintained “chiefly by the sporadic occurrence of new cases within the heart of families spared until that point.”

Once it had been learned how to distinguish leprosy from other similar dermatological diseases – such as mycosis, psoriasis, rhinoscleroma, erisipelas, etc. – no new cases of infection were transmitted in unaffected countries, even when visited by victims of Hansen’s disease. This fact also argued against the idea of direct contagion: “I myself know of some ten lepers who have left for Germany in recent years.”

To explain the peculiarities of indirect transmission, Lutz acknowledged hypothetically that the sufferer’s blood or mucous secretions, containing the infectious agent, might require “a period of maturation at a lower temperature in order to develop communicability (for example, by means of spores or forms of resistance, or another stage in its evolutional cycle), or perhaps ... exposed direct inoculation is also indispensable (for example, through biting insects).”

At the end of the paper written in Limeira and published in Germany in 1887, Lutz added the following observation: “Given the isolated situation in which I find myself, I have been obliged to completely relinquish any possibility of taking the existing bibliography into thorough account.” He had not had access to Leloir’s new book, “and only by chance [had he] received a review of the same, written by Unna ... I see with satisfaction that many of our observations coincide, and I hope the reader will take as corroboration any involuntary repetitions.”

Henry Leloir (1886) seems to have been one of the first to consider transmission of the leprous “virus” by mosquitoes. Although Edward Arning was author of a crucial experiment favoring the idea of leprosy by contagion, in 1891, he had, like Lutz, made a correlation between the rather concomitant
appearance of the disease and of mosquitoes on the Hawaiian Islands. The most important contribution here may be that of Mouritz: in February of 1885, he examined 178 kokuas who lived among lepers in Molokai, finding no evidence of the disease; a year later, seventeen showed symptoms of leprosy. Mouritz developed the hypothesis that it could enter the body by means of skin fissures and external mucous membranes, possibly via insect bites or the presence of ectoparasites, such as scabies (Souza Araújo, 1929, p.65).

Hallopeau, Chantemesse, Sommer, Leboeuf, Noc, Scott, Joly, Blanchard, and, a little later, the Colombians Juan de Dios Carraquilla and Guillermo Muños Rivas were other names associated with the theory that leprosy is transmitted “by arthropods, particularly acarines and insects, and above all mosquitoes.”

Of those mentioned above, the name Raphael Blanchard is of special interest here. A physician and parasitologist, Blanchard seems to have been the ‘Manson’ of French tropical medicine.28 He was a central figure in the network that linked zoologists and parasitologists from around the world, who were increasingly focused on medical topics (in this regard, see Sanjad, 2003, p.85-111; Caponi, 2003, p.113-49). Blanchard was a founder and secretary-general (1876-1900) of the Société Zoologique de France and, together with Alphonse Milne-Edwards, he organized the international zoology conferences that defined more precise rules for zoological nomenclature, the first, in 1889, and subsequently every three years. Blanchard chaired the Permanent International Commission on Zoological Nomenclature starting in 1898, the year in which the Archives de Parasitologie were created. In 1902, he founded the Institut de Médecine Coloniale, which provided training in parasitology for French and foreign physicians working in the so-called warm countries.

There was great repercussion when Blanchard voiced his opinion in the Bulletin de l’Academie de Médecine (1900) and the Archives de Parasitologie (1901) that leprosy could be transmitted by mosquitoes not only in hot countries, where it was endemic, but even in Paris, which should thus gird itself against...
these new enemies of public health. In 1905, Blanchard published Les moustiques: Histoire naturelle et médicale, one of the founding treatises of medical entomology. In Lutz’ words (1939, p.477), the work presented an “excellent summary of the arguments favoring culicidian transmission of leprosy.” In it, the French parasitologist commented on the mosquito’s place in zoological classification, its morphology and anatomy, its habits and metamorphoses, and its genera and species. In chapter V, before presenting prevention measures against mosquitoes, he analyzed their proven role as carriers of malaria, yellow fever, and lymphatic filariasis, and their “presumed” role in transmitting other diseases – not just leprosy (p.543-5) but also scurvy, dengue fever, plague, hot-climate ulcer, warts, moles, undulant fever, and an equine epizote from South Africa.

The 2nd International Leprosy Congress, held in the Norwegian city of Bergen in 1909, approved a recommendation by the British delegation that the problem of leprosy transmission by insects should be elucidated (conclusion VI, cited by Souza Araújo, 1952, p.1). A number of leprologists were already examining mosquitoes that had bitten sufferers of the disease, and in some they had found acid-fast bacilli. Others were undertaking experiments with insect bites but had not come up with any convincing results. According to Adolpho Lutz (1939, p.476), this was because the experiments were not “conducted using rigorous methods … In addition to other errors, the interval needed for the germ to incubate in the mosquito’s body was not taken into account.”

In a letter sent to Lutz in June 1905, Blanchard asked him what studies he had already published on the transmission of leprosy by mosquitoes; he apologized for his inquiry by explaining that “unfortunately, papers published in Brazil are not very accessible here.” Although Lutz’ stay in Hawaii had reinforced his conviction that the culicidian hypothesis was the most appropriate way of explaining the transmission of leprosy, since he was “unable to present positive proof” he had published nothing on the topic: “I merely … upon the occasion of a congress, requested that professor Unna, in my name, call leprologists’ attention to the matter” (cited in Souza Araújo, 1956, p.130). The Brazilian zoologist and bacteriologist sent mosquitoes for Blanchard’s entomological collection, “which did not include, so to speak, any South American type.” He also sent him a brochure on yellow fever.

During Adolpho Lutz’ time as head of the Instituto Bacteriológico de São Paulo [Bacteriological Institute of São Paulo] (1893-1908), leprosy was the subject of epidemiological and laboratory studies but it took second stage to
other, more burning questions in the realm of state public health, such as diphtheria, typhoid fever, cholera, amoebic and bacillary dysentery, bubonic plague, malaria, and yellow fever. In point of fact, Lutz gathered only scant results on leprosy, according to the reports he wrote during those years. In 1893, still as interim director, he repeated the experiments he had performed earlier at Unna’s laboratory in Hamburg and at Lazarus Hospital in Rio; these attempts to cultivate Hansen’s bacillus proved equally frustrating (see Lutz, 1895, p.207-8).

Leprosy was only mentioned again in his report on the year 1898, wherein Lutz highlighted events surrounding the consolidation of tropical medicine in England and Germany. The scientist hailed the inauguration of London’s school of tropical medicine and the forthcoming creation of another one, in Liverpool, as well as the launching of the *Journal of Tropical Medicine*, published in the British capital by James Coultie and W.L. Simpson. Lutz rejoiced over publication of two “excellent” treatises, one by Manson on *Tropical diseases* (1898) and another by Botto Scheube (1853-1923), entitled *Die Krankheiten der warmen Länder* (1898). He also made mention of a session dedicated to tropical diseases, inaugurated at the 66th meeting of the British Medical Association, held in Edinburgh in July of that year. Of special note among the papers presented there was Manson’s work on Ronald Ross’ research, tending “to prove the theory that mosquitoes play an important role in spreading malaria.” Robert Koch had organized an expedition to several countries to investigate transmission of that disease, then being studied both by Lutz and his team in São Paulo and also by Francisco Fajardo, Oswaldo Cruz, and some other bacteriologists in Rio de Janeiro.

The 1st International Leprosy Congress, held in Berlin in October 1897, was included by Lutz among events surrounding this establishment of tropical medicine and the strengthening of a medicine grounded on “precise observations” made possible through the natural sciences. Lutz lamented the fact that the São Paulo state government had not sent him or any other delegate to the congress. Disease transmission by haematophagous insects was the overriding idea that served as his touchstone in assessing the papers presented in Berlin, “generally of little import.” Hansen’s bacillus had come out strengthened while the theory of hereditary transmission of leprosy lost force, Lutz pointed out. The serum developed by the Colombian Juan de Dios Carrasquilla, already rejected in tests conducted at the Instituto Bacteriológico de São Paulo, found “rare supporters,” and yet Lutz still lamented that the
assembly had “not more energetically condemned these absurd syllogisms and observations holding to no criteria” (Lutz, 1898, p.5-6). In his report, Lutz did not mention the transmission of leprosy by mosquitoes but he certainly had this in mind when he commented that in Berlin “the danger of contagion [was] somewhat exaggerated by those who have observed the illness less” (ibid., p.5).

The summary of research conducted at the Instituto Bacteriológico de São Paulo from 1892 through 1906 condenses experiments dealing with leprosy to a few paragraphs. The disease had been the reason behind only three autopsies during that entire period, a number that contrasts with the many dozens performed because of the other diseases mentioned above, epidemics then sweeping across the state. Although he was unable to cultivate the leprosy bacillus, Lutz saw no problem with laboratory exams meant to corroborate clinical exams: he performed twenty on soldiers from the Força Pública. Hansen’s bacillus was easily found in the liquid of tubercles and in ulcerations of the nasal mucous, as well as in the lymph glands corresponding to the affected region. Due to its shape and way of reacting to staining, it could only be confused with Koch’s bacillus, but such a mix-up would be almost impossible given the two illnesses' differing symptomologies and also the grouping characteristic of Hansen’s bacilli. (Lutz, Revista Medica de São Paulo, 1907, p.81)

This report is the only one that mentions studies on transmission of this germ by mosquitoes. Lutz had ascertained that the germ did not move into the insect’s stomach, even when the tubercules themselves were pricked. “The opposite must happen during periods of fever, when the bacilli are circulating in the blood, but there has been no opportunity to verify this fact” (ibid., p.81).

In 1901-1902, Adolpho Lutz arranged to repeat in São Paulo the experiments that a U.S. mission headed by Walter Reed had just completed in Cuba in an effort to prove Carlos Juan Finlay’s theory on the transmission of yellow fever by Stegomyia fasciata (currently Aedes aegypti). The goal of both Lutz and Emilio Ribas, director of São Paulo’s Sanitation Service, was to win over to their new prevention strategy physicians and lay people who believed in the miasmatic etiology and especially in the bacilli and fungi inculpated by Domingos Freire, Giuseppe Sanarelli, and others in search of the yellow fever microbe. Lutz’ and Ribas’ demonstration helped clear the way for the campaign against Stegomyia fasciata led by Oswaldo Cruz in the city of Rio de Janeiro in 1903-5, as part of other sanitation and urbanistic measures aimed at “regenerating”
and “civilizing” the city, which was at that time the capital of Brazil (Abreu, 1987; Benchimol, 1992).

After his 1908 move to Instituto Oswaldo Cruz, Adolpho Lutz, who had been studying carriers of yellow fever and malaria for some time, resumed his research on haematophagous insects that might be able to host the leprosy microorganism. The disease was moving farther up on the agenda of sanitary concerns, and at Manguinhos Lutz found both the time and laboratory facilities needed for his return to a line of research that had been smothered by the burdensome routine of public health in São Paulo. All indications are that his results were inconclusive. Nevertheless, for the first time he publicly and with great emphasis upheld the theory of leprosy transmission by mosquitoes, and in this campaign brought to bear both his sparse experimental results and all the weight of his scientific authority.
The 1915 controversy and its consequences

A sanitation code that was drawn up by Oswaldo Cruz after his 1903 appointment as General Director of Public Health required that certain diseases be reported to the government. Leprosy was among them, as were yellow fever, bubonic plague, cholera, smallpox, and diphtheria. Despite the contagionist assumptions underlying this code, and perhaps thanks to Lutz’ influence, the “specific instructions regarding each one of the illnesses that must be reported” considered that “mosquitoes and other human parasitic insects (fleas, bedbugs, etc.)” were to be suspected of “carrying and transmitting the leprosy bacillus.”

In a report written at the peak of Rio de Janeiro’s sanitation campaign, Oswaldo Cruz brought leprosy to the limelight: twenty-three cases had been reported in 1904, and the disease was raging through the city. The chronic nature of the illness made it unfeasible to intern victims at the isolation hospitals intended for people with acute infectious diseases. Therefore, the ill should be “sequestered” in “leper colonies’ where sufferers would find, together with essential treatment, the elements needed for continuing with their activities, still quite useful.” Oswaldo Cruz (1905, p.67) considered transforming the pesthouse on Ilha Grande into the first of these settlements, with “all the elements of comfort required in accord with the habits of the various social classes.”

The idea of quarantining victims on an island, as in Molokai – or as had been the case in Bom Jesus, right in Rio’s Guanabara Bay – was put forward by three São Paulo physicians: Alberto Seabra and two of Adolpho Lutz’ assistants at the Instituto Bacteriológico, Ulysses Paranhos and Adolpho Lindenberg. At the 6th Brazilian Congress of Medicine and Surgery, held in that state during September 1907, their motion to that effect was approved.

In an interview published in O Imparcial on July 3, 1913, four years after leaving his post as head of public health, Oswaldo Cruz reintroduced the proposal to quarantine the afflicted in a farm settlement, to be built on Ilha Grande. His warnings about the danger of the spread of leprosy, “Death’s oldest daughter,” found sympathetic ears in the federal Senate, where São Paulo’s representative, Francisco Glicério, sponsored a budget amendment allocating 170:000:000 to the proposed leprosarium (Souza Araújo, 1956, p.117).

In mid-1915, a commission was set up to study the “most terrible of the epidemics that have been developing in frightening fashion in recent times.” This use of dramatic language is in perfect tune with Obregón’s description of
the situation in Colombia during the same period. However, the similarity in discourse does not mean that leprosy acquired the same importance here as it did in that country when it came to the professional legitimization of physicians and sanitarians. According to Obregón (1996, p.172-3), when Colombian doctors joined the international movement to set up leprosariums, they exaggerated the magnitude of the disease and spread panic among the public and governmental authorities because they needed to convince them, first, that charitable institutions would be unable to handle the disease and, second, that it constituted a much more serious public health concern than imagined, controllable only by those with the necessary qualifications, that is, by physicians. The “medicalization” of leprosy was therefore a predominant dimension in the professionalization of Colombian medicine. Its leaders sought to forge a “national medicine,” focused on local illnesses – and from then on Colombia was viewed as one of the world’s major settings for leprosy.

Although associated with one particular disease, thereafter considered a great threat to urban populations, Brazil’s mobilization against leprosy reflected a deeper movement aimed at redirecting the country’s sanitation agenda towards so-called rural endemic diseases. Between 1917 and 1920, new legal and institutional policy bases were laid down (see Hochman, 1998). But at the top of Brazil’s public health agenda, also dominating the social and professional dynamics of the medical field, were hookworm, Chagas’ disease, malaria, and yellow fever.

Leprosy, tuberculosis, and syphilis entered the arena of public health policies, at the same time remaining causes embraced by philanthropy and organizations of civil society, especially the former, in the name of which large-scale mobilizations would take place in a number of states in Brazil beginning around 1910.

When Oswaldo Cruz passed away on February 11, 1917, the institute christened in his honor was the center of gravity for a combative group of physicians who were calling for the modernization of Brazil’s sanitation services. The key leaders were Carlos Chagas, Oswaldo Cruz’s successor as head of Manguinhos (from 1918 until his death in 1934), and the indefatigable Belisário Pena, author of vehement articles and of Saneamento do Brasil, a book that was to mark an era in Brazilian public health (Lima and Britto, 1996; Lima, 1999; Britto, 1995).

The Liga Pró-Saneamento (Pro-Sanitation League), inaugurated at the headquarters of Brazil’s National Agricultural Society on February 11, 1918
(first anniversary of Oswaldo Cruz’s death), rallied a large number of physicians and intellectuals around its banners: eradication of the endemic diseases that hampered the nation’s development and that demanded a centralized, ‘scientific’ sanitation policy capable of overcoming the roadblocks created by state autonomy and able to safeguard health activities from the patronage politics of local potentates.

The oligarchic bloc in power gave in to some of these demands. On May 1, 1918, President Wenceslau Brás signed into law a decree that created the Rural Prophylaxis Service, and granted its head, Belisário Pena, one thousand contos to establish more health posts in the Federal District.

The arrival of the Spanish flu in Brazil late that year aggravated the already troublesome effects of the disagreements between oligarchies common during times of presidential transfer of power. The winning candidate, Rodrigues Alves, fell victim to the flu before taking office. Epitácio Pessoa was then elected. He was from Paraíba, a state lying outside the region of the so-called “café com leite” (coffee with milk) pact, formed by São Paulo and Minas Gerais.
This favored calls for greater power to the national public health sector, to the
detriment of the states’ autonomy. On November 22, 1919, Epitácio Pessoa
sent the federal legislature a message proposing the reform of health services:
“Whether a new ministry is created or the current organization is maintained,
what is indispensable is to expand the sphere of our sanitary defense” (cited in
Hochman, 1998, p.23). In January 1920, the National Public Health Department
was created, still under the auspices of the government’s most political ministry,
the Ministry of Justice and the Interior. Chagas’s appointment as director (a
post he held until 1926) reestablished Instituto Oswaldo Cruz’s umbilical link
with a more autonomous and better-equipped public health service.

Created together with the Rural Prophylaxis Service, on May 1, 1918, the
Official Medications Service fortified Manguinhos’ industrial side. The main
object of this service (also set up at São Paulo’s Instituto Butantã) was to
prepare and distribute quinine. In addition to developing this malaria-prevention
medicine and also tartar emetic, used in treating leishmaniasis, Instituto
Oswaldo Cruz’s applied chemistry division developed other “official
medications”: in 1921, sorosol, for syphilis, and in 1924, sodium salts in gelatin
capsules and esters made from chaulmoogra oil to treat leprosy. Analysis of
vegetable oils from Brazilian botanical species led to the preparation of the oil
of the charpotrochis plant (Carpotroche brasiliensis), used by Souza Araújo to
treat the same disease.

Regarding this endemic disease, viewed perhaps as the greatest health
threat to urban centers, Oswaldo Cruz’s July 3, 1913 interview to O Imparcial
ignited a movement that came to encompass all of Rio’s medical societies. The
Bahian physicians Belmiro Valverde and Juliano Moreira proposed to the
Associação Médico-Cirúrgico do Rio de Janeiro [Rio de Janeiro Medical-Surgical
Association] that a Comissão de Profilaxia da Lepra [Leprosy Prophylaxis
Commission] be organized. The Rio association nominated Paulo da Silva Araújo
and Henrique de Beaurepaire Rohan Aragão to be part of it as well. Academia
Nacional de Medicina [National Academy of Medicine] nominated Emilio Gomes,
Alfredo Porto, and Henrique Autran. Other members of the commission
included Eduardo Rabello, Werneck Machado, and Gudes de Mello, from the
Society for Medicine and Surgery; Sampaio Vianna, Silva Araújo Filho and
Oscar D’Utra e Silva, from Sociedade Médica dos Hospitais [Medical Society
of Hospitals]; and Fernando Terra, Juliano Moreira, and Adolpho Lutz, from
Sociedade Brasileira de Dermatologia [Brazilian Society of Dermatology]. Carlos
Pinto Seidl, director-general of Public Health, was chosen to head the
commission, and he appointed moderators for the subgroups that were to analyze specific aspects of leprosy in Brazil.

The commission’s work ran from 1915 through 1919 and yielded a number of reports and public statements, compiled and transcribed in whole or part by Souza Araújo (1956). These included Silva Araújo and Valverde’s observations on leprosy and marriage; Werneck Machado and Emilio Gomes’ on leprosy and occupation; and Adolpho Lutz and Henrique Aragão’s on leprosy and immigration. Eduardo Rabello and Silva Araújo Filho studied the disease’s relation to domicile, and Juliano Moreira and Fernando Terra, its relation to isolation.

A survey of epidemiological data was to provide the basis for the prevention offensive. Despite the dramatic adjectives used to describe the spread of this disease, Oswaldo Cruz himself admitted in his 1913 interview that Brazil’s public health officials did not really know how many sufferers there were in the federal capital or the rest of the country.

The debates leading up to the formulation of government guidelines in the fight against leprosy, starting in the 1920s, rekindled the old controversy about heredity versus contagion. The inarguable hegemony of the latter proponents was challenged by Adolpho Lutz, leader of a third line of thought which seems to have enjoyed greater visibility in Brazil than elsewhere. Although moderator of one specific topic, Lutz’ prestige as a scientist and leprologist assured him the privilege of espousing his views at a conference given on November 5, 1915. His lecture was attended by many physicians and medical students, and also by the Minister of Justice and the Interior, Dr. Carlos Maximiliano, honorary chairman of Comissão de Profilaxia da Lepra.

The Jornal do Commercio (Nov. 7, 1915) transcribed the conference in its entirety (partially transcribed in Souza Araujo, 1956, p.124-7) and summed up the orator’s position in these words:

> through exclusion of other blood-sucking insects as possible carriers of leprosy, the mosquito should be identified as the sole cause of transmission of this illness (whether *Culex fatigans* or *Stegomyia fasciata*), when it sucks in, and only in this case, the blood of lepers during febrile stages of bacillemia.

Aware of his authority, Adolpho Lutz attributed the endless disputes on the transmission of leprosy to “preconceived ideas” and to a “flawed knowledge of the literature and of the disease itself, which is the rule and not the exception among the medical classes in all countries.” Brazilian physicians were not familiar with the book that Lutz considered a “veritable bible,” the *Handbuch
der Historisch-Geographischen Pathologie, written by August Hirsch (1817-94), with “German patience.” They were also unfamiliar with studies released during the previous thirty-five years (since he had begun studying leprosy) in the Monatshefte für Praktische Dermatologie and in similar periodicals on skin diseases. These readings would have allowed them to observe leprosy with their “own eyes” – a remark that carries between its lines a criticism of Brazilian physicians’ dependence on Francophone authors.

Lutz believed the dichotomy between heritability and contagion to be a false one. Leprosy was indeed more common in certain families but this did not mean it was hereditary “because if that were the case, descendants could not fall ill before their ancestors, as is extremely common.” The theory did not explain how multiple cases occurred in families where older generations had not acquired the disease, either because they had emigrated from unaffected regions or because leprosy did not yet exist in the place where their children and grandchildren would come to fall ill.

In Lutz’ opinion, the notion that leprosy was contagious had gained ground in Europe during a time when the disease was common and tending to spread. When it had become rare, with a prevalence only of imported cases, the theory of heritability became the most plausible way to account for the victims that were to be found in but a few families.

But it is only under these circumstances that someone could suggest that the illness endured solely by heritability. In other countries where the illness is common, and where there is at the same time much immigration from unaffected countries, this statement is wholly incomprehensible. I have for certain seen over one hundred people from unaffected places, already adult, who caught the illness in Brazil or in another place where it is endemic, and this also proves that nationality does not indicate a predisposition, because a great proportion of representatives of unaffected countries fall ill. (Jorn. Comm., Nov. 7, 1915)

But advocates of the theory of heritability were not Adolpho Lutz’ greatest opponents; rather, it was the proponents of the theory of contagion, understood here as direct transmission of the disease from one person to another. The latter invariably pinned their certainties on a historic argument: the longevity of the disease in Europe and its ebbing or virtual disappearance thanks to the isolation of sufferers in leprosariums. For Lutz, it was a mistake to assume that all of the ill had been isolated. Many cases must have gone unnoticed, given the characteristics of the disease – its slow evolution, sores that were hard to identify with precision – or because of family efforts to hide the ill.
Lutz did not question whether leprosy could be communicable under certain conditions, which included, necessarily, the pre-existence of other cases, but this did not prove direct contagion. He pointed out several anomalies in the theory, many of which had already been raised by those defending the theory of heritability. Individuals fell ill without having had contact with sufferers. The incubation period was sometimes short, other times lengthy. Europeans returned to their homes with leprosy picked up abroad and were interned in public hospitals, yet they did not produce foci of the disease. Paris, Vienna, and other Old World capitals remained unaffected.

To counter his adversaries, Lutz cited the repeated unsuccessful attempts to transmit Hansen’s bacillus to people and to animals and also the problems in obtaining pure cultures of the microorganism.

In conjunction with the infection’s erratic character, such anomalies made leprosy very different from contagious diseases like tuberculosis and syphilis, and impugned the analogy with other infectious processes, like yellow fever first and foremost and also exanthemic typhus, malaria, and ancylostomiasis, where the appearance of one case depended upon the earlier appearance of another although the disease could be caught without any direct contact between victims. Studies of the bubonic plague that linked it to the fleas carried by rats had negated the supposition that diseases caused by bacteria could have nothing to do with transmission by blood-sucking species.

The epidemiological characteristics of leprosy, however, made it necessary to exclude such ubiquitous species as fleas and bedbugs, mites, and other insects common in big cities. “Thus we are left with haematophagous Diptera,” Lutz concluded.35

His experience in Hawaii and his knowledge of the entomological literature equipped him to close the circle on two groups: Culex and, to a lesser degree, Stegomyia.

At the November 1915 conference, Lutz explained that the first Europeans to set foot on Hawaiian soil were some Spaniards who had been shipwrecked there in 1749. The seamen who rediscovered the archipelago in 1778 brought syphilis and gonorrhea to the native population. The first cases of leprosy appeared only after 1840, at first only in very small numbers, and Lutz supposed the endemic disease had originated from a single case. It spread so much that by 1889 nearly 5% of the native population had been struck and 2.5% had already been isolated. A much smaller proportion of foreigners had fallen sick, that is, about five out of every thousand.36
Mosquitoes: *Culex pipiens* (1); *Aedes nemorosus* (2); *Stegomyia fasciata* (3) and *Anopheles maculipennis* (4). Ségy (1938, plate X).
In the early 1820s, Lutz stated, there were as yet no mosquitoes in Hawaii. He believed that *Culex fatigans* had been introduced in 1828, “or earlier, by a ship that ran aground on the beach.” He believed *Stegomyia fasciata* had arrived later. At the time Lutz was on the islands, only those two species existed, and they had become “extremely abundant,” partly owing to extensive aquatic plantings of taro and rice. Lutz suspected that the main carriers of leprosy were the Culex, that is, both *fatigans* that existed in Hawaii as well as similar species found in cold-climate countries. The role of *Stegomyia* was “more uncertain.” Phlebotomous flies (sandflies), maruins and mosquitos-pólvora, and mutuca flies – none of which existed in Hawaii – must play a secondary role in the transmission of leprosy.

“Applauded at length,” Adolpho Lutz’ conference fueled heated debates during at least two more sessions of Comissão de Profilaxia da Lepra, and stories of these circulated in the press. Not a single physician came to the defense of the idea of hereditary transmission. However, reinterpreted in the light of eugenics as “predisposition,” this idea was subsumed into the contagionist platform, as an active factor in specific cases of transmission. Stalwart supporters of Lutz’ ideas included Henrique Aragão, also from Instituto Oswaldo Cruz, and Emílio Gomes, a long-time bacteriologist in Rio’s public health sector. Most members of the committee had no difficulty in reconciling certain proposals of those who believed in culicidian transmission with calls for segregation as a preventive measure, based on the idea that leprosy was highly contagious. Although no one failed to sing the praises of Lutz’ wisdom, he also had firm adversaries: Fernando Terra and especially Belmiro Valverde. The former was director of Lazarus Hospital, dermatology professor at the Faculdade de Medicina do Rio de Janeiro [Rio de Janeiro Faculty of Medicine], and president of Sociedade Brasileira de Dermatologia.

Belmiro de Lima Valverde was born in 1884, Alagoinhas, Bahia, and died in the city of Rio de Janeiro in 1963. He became well known as a result of his activism during the 1930s in an organization called Ação Integralista Brasileira. His name began to appear in political news before the beginning of Getúlio Vargas dictatorship, when he fought against Arthur Bernardes government, which resulted in him going into exile in Europe for a time. Graduated in 1906 from Faculdade de Medicina da Bahia [Bahia Faculty of Medicine], Valverde did clinical work in the Upper Amazon region and in 1912 moved to Itápolis, in the interior of the state of São Paulo, where his father-in-law owned a pharmacy, *Farmácia Italiana*. 
In 1913, during a session that took place on June 30, Academia Nacional de Medicina named “Prophylaxis and treatment of leprosy” as one of the issues for a research competition during the coming year. Valverde entered a paper with this title and received honorable mention on June 4, 1914.

In February of the following year, he moved to Rio. For many years he worked as the head of the Urology Department of Policlínica do Rio de Janeiro. In 1916, as part of the requirements for becoming a docent in the area of hygiene at Faculdade de Medicina do Rio de Janeiro, he defended a thesis on leprosy prevention (published by Casa Mayença Cruzeiro).37

On December 3, a debate that took place among the Committee for Leprosy Prevention became heated when Lutz presented an addendum to his paper from the previous meeting, and Belmiro Valverde gave a talk on leprosy transmission.38

Contagionists, with the Bahian physician as principal spokesman, hurled against Lutz the plentiful case histories used earlier against hereditarians by Hildebrand, Kalindero, Taché, and others. They had no hesitations about retelling stories set in far-off places, veritable myths like the tale of the European lad who was playing with a small leper in Borneo and, when he saw him prick his anaesthetized skin with a knife, without feeling anything, mimicked the gesture and fell ill. Or the story of the leprous mother, with lesions on her breast, who had transmitted the disease to her son (on his face) while nursing him. Or the story of the porter who had caught leprosy when he injured his shoulder blade while carrying a leper’s cadaver. The renowned bacteriologist Victor Babes, one of the experts whose name was invoked by Valverde, attributed the paucity of cases among doctors and nurses, unquestionable even though less blatant than in the case of other diseases, to the measures they took to avoid contagion.

The authors cited by Lutz’ adversaries laid heavy stress on cases transmitted arm to arm, by smallpox vaccination. This was in fact the hypothesis underlying Arning’s experiment with the prisoner Keanu. In the opinion of Scheube, a German physician praised by Lutz earlier in these pages, the small-pox vaccine had played a considerable role in spreading leprosy on the Hawaiian archipelago. According to Babes, it did not attack the inhabitants of the British Indies who refused the vaccine.

A third set of evidence had to do with transmission by fomites, especially infected clothing. Valverde told of cases he had observed himself in Amazonas, as well as those by Ross in India, and also by Manson, Babes, Scheube, Hansen,
Lorand and Looft, which made it evident that washerwomen were especially susceptible to leprosy.

All these case histories, which Lutz called “of little value,” brought into the open disagreements about diagnostics and, above all, about the role of lesions in spreading the disease. For contagionists, the prime way in which infectious bacilli spread was via secretions from ulcers and nasal mucous, with the nose being the site of the first leprous lesions – and this gave new life to terrifying old ideas about contagion via the air.

For Lutz, most bacilli eliminated through the mucous membranes and ulcerated skin lost their strength once in contact with the environment. “If they were all alive and capable of direct infection, the causes of contagion would be most numerous, which is not the case. They should also be observed all over.” Calling into question his adversaries’ clinical experience, he stated that leprosy generally began:

with a hyperemic spot, more or less infiltrated ... I have seen a regular number of such cases, which are completely unknown to most doctors ... on the back of the foot or the hand or on the face, usually on the forehead, which is a very common place. In such cases, the nasal mucous is usually not affected yet, nor is anything else in the mucous glands affected, which would be the case if the illness spread like syphilis. On the other hand, these places match entirely with what would be expected in the case of transmission by mosquitoes, something that has always struck me, right from the beginning of my studies on the topic. (Jorn. Comm., Dec. 6, 1915)

According to Lutz’ principal champion in this controversy, Henrique Aragão (cited in Souza Aratijo, 1956, p.137-41), it had been shown through some one hundred experimental inoculations that the germs in the nodules, ulcerations, and other spots on the body had no ability to infect. On the other hand, a number of authors, not necessarily identified with transmission by insects, had recognized that bouts of fever somehow played a role in spreading the disease. The microorganisms that appeared in the sick person’s blood during these periods had been proven to be virulent. Thus, haematophagous insects could readily become infected during such bouts, when bacillemia was easily demonstrable through Beurmann and Gougerot’s process. The sufferer was thus in a position akin to a yellow-fever sufferer on the days when he could infect the Stegomyia fasciata, or akin to a victim of the plague, during the septicemic stage, when the flea could ingest Yersin’s bacillus.39
Contagionists rightfully denounced the lack of experimental data to prove the role of the mosquito as a carrier of Hansen’s bacillus, a criticism that neither Lutz nor Aragão could refute.

In Aragão’s opinion, it was a “widely demonstrated” fact that bacilli could be found in the digestive tubes of haematophagous insects that had bitten lepers. Cardoso Fontes, another researcher at Manguinhos, and Emilio Gomes had found acid-fast bacilli quite like leprosy bacilli in the digestive tubes of mosquitoes caught in Lazarus Hospital rooms (cited in Souza Araújo, p.138). But Adolpho Lutz admitted that this was unusual and that multiplication of these microorganisms within the mosquitoes was not yet a proven fact. Lutz and Aragão blamed the failure of many researchers on their attempts to infect mosquitoes by making them prick leprous nodules and patients when they were not febrile.

“I have, in earlier days, had occasion to verify,” Lutz stated that generally when mosquitoes bite leprous tubercles, they do not ingest bacilli but they cannot fail to do so when they bite febrile individuals, with bacilli in the blood. Usable cases are quite rare, and experiments with Culex fatigans, which only bites in freedom, are difficult. Only a small proportion of mosquitoes are probably infected and of these only a small fraction, perhaps, ever transmits the bacilli. If this were not the case, infection would be much more common, and demonstrating it, easier. (*Jorn. Comm.*, Nov. 7, 1915).

The argumentation presented by Lutz and Aragão – like that of Rochard, fifteen years earlier – was founded above all on epidemiological aspects of leprosy, and they in fact transformed anomalies observed in the laboratory into facts consonant with the spreading of the disease:

transmission via the bite of an infected mosquito cannot be common. Yet this is precisely one of the necessary conditions, because if this were not the case, we would have serious epidemics ... It would thus be necessary to examine thousands of mosquitoes to find the one with the power to infect. (*Jorn. Comm.*, Dec. 6, 1915, cited in Souza Araújo, 1956, p.130)

To judge from contagionists’ papers, few investigators had obtained experimental evidence contradicting transmission by mosquitoes: their results either were not conclusive or did not exclude the role of other blood-suckers. Valverde made mention of a Danish commission comprising Ehlers, With, Verdier, and Bourret that had studied the transmission of leprosy in the Antilles and that had concluded that Hansen’s bacilli were found only rarely in the
mosquito’s digestive tube. Valverde also cited research by John Lindsay, conducted on the border between Brazil and Paraguay, where leprosy was supposedly more infectious than pulmonary tuberculosis, something the English physician attributed to unhealthy homes. Lindsay had found a large number of bedbugs in beds and on walls there, and he presumed they played just as important a role in transmitting leprosy as crowded, stuffy, dark housing.

Although an unwavering contagionist, Valverde allowed that insects could be involved, particularly flies, which were proven carriers of the tubercle bacillus, quite similar to Hansen’s. He even cited experiments by Marchoux, who had infected rats by exposing them to flies that had fed on the soft mass of leprous tubercles.

Adolpho Lutz, who had at first discarded the possibility of a role by ubiquitous insects, altered his position at the second conference: “There is no objection to including other haematophagous Diptera among possible carriers of leprosy, but there is reason to suspect mosquitoes.” 40

As we have seen, Culex fatigans and pipiens were the principal mosquitoes inculpated by Lutz, but Stegomyia and other domestic species were not excluded. “As to Simuliidae, Phlebotomous flies, mosquitos-pólvora, it can only be said that they cannot be the only carriers” (ibid.). During the debates, Lutz acknowledged that Simuliidae could account for the occurrence of leprosy in places where there were supposedly no Culicidae, like the Alps, Norway, and Ireland – often the settings of contagionist case histories – but he warned that these blood-suckers, “very common in mountainous regions but unknown in most large cities … can only be of local import.” 41

The geographic distribution of mosquitoes was the hottest topic of this controversy with contagionists. Lutz and his allies argued that the “capricious” way in which leprosy spread and the absence of epidemics or endemicity in regions visited by victims made the involvement of mosquitoes undeniable. For contagionists, an analogous rhetorical role was played by the argument that the mosquitoes indicated by Adolpho Lutz did not exist in regions where leprosy was endemic.

In this area, Lutz was at an advantage. He was an entomologist of renowned skill, highly respected even by the few foreign experts that contagionists relied on. But since medical entomology was still a young discipline (it had been around for barely two decades), the comparative study of the distribution of leprosy and of mosquitoes yielded inexact results. As competent as Lutz may have been, there would never be a perfect overlapping of the two geographic
maps. Beyond this, or perhaps because of this, the multiplicity of hypothetical hosts for Hansen’s bacillus in different regions of the globe was another discomfiting factor in Lutz’ theory.

To uphold his theory, Adolpho Lutz, unwavering defender of the hard and fast facts obtained in a laboratory, the man who peppered his speech with “precisely,” had no choice but to use authoritative arguments in order to decide the dispute in his favor.

Valverde (cited in Souza Araújo, 1956, p.132-4) admitted he was wholly unfamiliar with medical entomology and “leafed through the masters” to see if they supported Lutz’ theory. He consulted Giles and especially Frederick Vincent Theobald’s monograph on Culicidae, or mosquitoes, and verified that there were no \textit{Culex fatigans} in Europe but only certain \textit{Culex} from cold countries and \textit{Stegomyia fasciata}.

Regarding North Africa, Valverde found only the description of \textit{Culex pipiens} and \textit{maculiventris} in Algeria and \textit{Culex pusillus} in Egypt. “Not a single word about \textit{Stegomyia fasciata}! So how then does one explain the transmission of leprosy in these countries? ... Is this yet another peculiarity of leprosy ... that it is the only disease spread by an enormous variety of mosquitoes?”

It was even harder to fit Asia into Lutz’ theory. In the central part of the continent, “there is not a single variety of \textit{Culex}, nor of \textit{Stegomyia}, and Theobald questioned ... the existence of \textit{Culex cuspius}!” In New Zealand, there were \textit{Culex albirostris}, \textit{pervigilans}, \textit{aussoralis}, and \textit{iracundus} but no \textit{fatigans} or \textit{Stegomyia fasciata}. On Madeira Island, a long-time focus of leprosy, only \textit{Culex longiareolatus} had been found.

The physician from Bahia pointed to certain facts that contradicted Lutz’ theory in Brazil as well. Amazonas was the state with the greatest infestation of mosquitoes but it was also among the states with a low rate of leprosy, and “in no way was it possible to make comparisons [with] São Paulo and Minas, Brazil’s two main foci, where there were infinitely fewer mosquitoes.”

In this arena, the polemic with the contagionists was championed mainly by Aragão, who criticized both Valverde’s scant knowledge of the authors he had cited and the fact that he had not turned to other, equally valuable sources:

When Theobald does not cite the existence of a given mosquito in a certain locale, it does not mean it did not exist there, and from this one can deduce no more than that they have not yet been collected in these places or they are cited in other works, unknown to Theobald at the time he drew up his work ... Moreover, in Theobald himself ... one finds references to the existence of \textit{Stegomyia} and \textit{Culex fatigans} in spots
where its presence was denied ... as, for instance, in Northern Africa, Egypt, in various parts of China, etc. Denying that *Stegomyia* exists in Africa is absurd, inasmuch as this continent is the cradle of this species that later became cosmopolitan ... What is also found in Theobald, and should be commented here, is that this notable, highly skilled specialist in mosquitoes has such great regard and esteem for Dr. Lutz that in his book he adopted our countryman’s classification in its entirety. (cited in Souza Araújo, 1956, p.140)\(^42\)

Advocates of the culicidian theory persistently reiterated analogies with yellow fever, not only comparing the means of transmission but also the styles of thinking and conduct displayed by adversaries of Finlay’s and Lutz’ theory. The 1915 debate was at first marked by the same adamancy that had characterized the 1903 confrontation between those who contended that yellow fever was transmitted solely by *Stegomyia fasciata* and those who were “unconvinced,” acknowledging the inclusion of the mosquito in a vaster network of pathways involving direct contagion by fomites.\(^43\) Although he still stuck firmly to his ideas on the transmission of leprosy, Lutz chose not to enter into rivalry with contagionists within the practical realm of prophylaxis. Beyond the fact that he didn’t carry the same weight as Oswaldo Cruz at the beginning of the century, the man was now his adversary – a silent yet highly influential one.

In their report on “Lepra e imigração” (cited in Souza Araújo, 1956, p.151-2), Lutz and Aragão proposed an accommodating approach that stood in contrast with the strict prevention measures in force in New York and other U.S. ports, measures that Brazilian sanitarians wanted to see enforced in the case of immigrants arriving in Brazil. The two scientists from Manguinhos believed there was only a minute danger of importing new cases of leprosy; it would be a bit ‘like taking owls to Athens’, since Brazil afforded better conditions for spreading the disease than the countries from which most immigrants came; “any irksome measure would of course compel reprisals, in addition to leaving very unfavorable impressions which it would be better to avoid” (ibid., p.151).

In the case of subsidized immigration, the government was responsible for excluding people with “defective” physical and psychological health backgrounds but without this entailing the adoption of “humiliating measures.” Before granting a free passage, the government could demand that the immigrant produce a certificate issued by a physician or authority from his or her place of origin, or by the physician on board, or even a “formal declaration by the head of household,” but prior to disembarkation, since in normal times the government could not force passengers to submit to a rigorous physical exam.
It would also not be fitting for companies to repatriate cases that only at the end of the trip are recognized. The leper thus risks the hazard of becoming a kind of errant Jew, and it would be well to consider what should be done with the ill under these circumstances. The simplest would be to allow them to board certain steamers, where there would be a doctor, but a small number of passengers, and during the trip they would occupy a small isolation hospital, protected by a wire screen, and after their arrival they would be subject to the decisions of the local sanitation authorities. If some concessions are not made for such cases, they will always try to hide their illness.

Lutz and Aragão also addressed the question of immigration by land. Brazil’s neighboring countries offered no great peril because no country, with the exception of Colombia, was believed to have a greater number of leprosy victims than Brazil. It would be enough for travelers to present a certificate to public health authorities and to customs. The same rule should be applied to those “countrymen who want to move from one place to another, because their number must be many times greater.” This certificate would have “a certain moral effect and make it possible to hold responsible those deliberately making false statements.”

We have already seen that Adolpho Lutz felt it ineffective and cruel to isolate victims of leprosy. During the debates, he asked his adversaries why they didn’t call for equally stringent measures for sequestering the victims of tuberculosis or other diseases transmitted by means of the processes erroneously attributed to leprosy (Souza Araújo, 1956, p.130-1). In The Microphysics of Power, Foucault (1984, p.88-9) makes a thought-provoking distinction between the two major organizational models that held sway in Western sanitation through the close of the nineteenth century: one model, inspired by leprosy and extended to embrace madmen and criminals, called for excluding these individuals from common spaces, in the name of purifying them; under the other, applied to the plague and other contagious diseases, individuals should be interned or settled in hospitals or other niches of urban space that could be scrutinized and where the individuals could be effectively watched. The policy that Oswaldo Cruz proposed in 1907 for carriers of the tubercle bacillus – when he felt the campaign against yellow fever had been victorious – was a draconian version of the second model, rejected by the government (see Benchimol, 1990, p.49-50; Nascimento, 1999; Bertolli Filho, 2001).

Although Adolpho Lutz proposed a third organizational model for leprosy, associated with the late-nineteenth-century appearance of intermediary hosts...
within the web formed by people, things, and microbes, he pragmatically admitted that isolation would hamper the spread of the disease if leprosariums were located well away from other housing, in environments not favorable to mosquitoes.

There is no avoiding the obligation of joining prevention measures against mosquitoes with every attempt at isolation, because individuals’ freedom should not be sacrificed without a maximum guarantee that this sacrifice will yield practical results ... I leave the dubious satisfaction of combating the new guideline to that class which endeavors to keep yellow fever among us, fighting prevention measures against mosquitoes, and who would like to repeat this opposition in regard to another, no less important question. (cited in Souza Araújo, 1956, p.130)

Expressing the opinion of most members of the Comissão de Profilaxia da Lepra, Juliano Moreira and Paulo da Silva Araújo proposed that the commission sponsor the experiments needed to confirm Lutz’ affirmations, and that it include protection against mosquitoes among planned prevention measures but not without urgently putting into practice the “universally adopted” ideas of direct contagion, mandatory reporting, disinfection, and isolation or exclusion of the ill (ibid., p.128).

The commission’s conclusions, meant to serve as the basis for a draft law,44 consisted of eleven items cast in the spirit of the contagionist program approved by the international congresses held in Berlin (1897) and Bergen (1909). The only exception was item IV, which defined the need “to undertake culicidian prophylaxis, that is, a set of efficient measures against mosquitoes able to transmit leprosy, with all due rigor, in cases of individuals confined to their homes or in leper colonies and asylums or isolated in villages and colonies.”

The American Leprosy Conference, which took place in Rio de Janeiro in October, 1922 amid festivities for the hundredth anniversary of Brazil’s independence from Portugal, seems to have held to this orientation, but Lutz (1921) no longer found the support he enjoyed in 1915.35 Still lacking conclusive experimental evidence, he was to come up against a greater number of adversaries, Belmiro Valverde still heading the list. The latter stated:

A number of agents have been inculpated as carriers of leprosy – mites, bedbugs, fleas, flies, mosquitoes, etc. ... Proponents of direct contagion acknowledge that ectoparasites might mechanically transport leprosy germs, as occurs with other diseases and as simple good sense would indicate. However, those who suppose that leprosy is transmitted by indirect link are dogmatic ... as is the case among us of Dr. Adolpho Lutz, who, although he has addressed himself to these matters for forty
years, still cannot present the slightest documentation showing the correctness of his ideas. Even now, in the middle of the Leprosy Conference, when some paper was to be expected from Dr. Lutz … in support of his theory, already defeated by critics, the illustrious sage has limited himself to reaffirming, without any evidence, without a single fact, without a single new word, that the mosquito is the carrier of leprosy, although in his assertions one no longer feels that same primitive enthusiasm as in 1915, when the great scientist made public, in much detail and with wide circulation, the ripened fruit of his reasoning. (*Jorn. Comm.*, Oct. 1922)

**Lutz is not alone: haematophagous insects as carriers of leprosy (1920-1950)**

These criticisms were founded. Still, Adolpho Lutz stuck firmly to his theory, bolstering it with arguments not much unlike those used in 1915, at the 2nd American Congress of Dermatology and Syphilology held in October 1921 in Montevideo, at the same time that Brazil’s newly created National Department of Public Health kicked off its segregationist offensive against leprosy’s victims through its *Inspetoria de Profilaxia da Leprosia e das Doenças Venéreas*.

During the Montevideo conference, there was a proposal to organize a conference, American Conference on Leprosy. “Problems related to the study of leprosy” (1922) brings together the papers presented by Adolpho Lutz in both events. The conference’s opening ceremonies, which took place on October 8, in the pavilion of the National Exposition, were presided over by the Minister of Foreign Relations. From October 9-14, papers were presented at the Academia Nacional de Medicina, with Lutz speaking in the evening session of October 13. He was one of the members of the organizing committee, which was presided over by Carlos Chagas. Valverde was one of three honorary presidents (Souza Araújo, 1956, p.364-72).

Although Lutz’ position was again defended by Emílio Gomes, the conference’s final conclusions were entirely shaped by the concern for a public campaign, in Brazil and throughout the Americas, focusing on “the fight against infection … the decisive element in the struggle against leprosy”; the only concession to Lutz’ ideas lay in the recommendation that the technical measures to be taken should reflect “the diverse schools of thought related to the transmission of the disease.”

In order to show that the National Department of Public Health would put into practice the guidelines recommended to other South American nations,
Carlos Chagas and the President of Brazil, Epitácio Pessoa, inaugurated the cornerstone of the “Federal Leprosarium” in Jacarepaguá, at that time a rural area belonging to the city of Rio de Janeiro. In the house that would be the offices of Curupaití Leprosarium, the public health department offered a table of sweets to the conference participants, journalists, and other guests.46

The prize awarded by the Academia Nacional de Medicina in 1921 to Belmiro Valverde’s monograph on “Prophylaxis and Treatment of Leprosy,” published the same year as Leprosy in Brazil, represented an endorsement by an important part of the capital city’s medical elite of the contagionist ideas that Valverde had supported so fervently since 1915.

Within the Academia, leprosy was one of the most frequently-discussed issues between 1921 and 1930, repeating the controversy between Valverde and Lutz’ faithful spokesman, Emílio Gomes. A number of scholars conciliated the contagion theory with the possible transmission by mosquitoes or other blood-sucking insects. The “eclectics” included Parreiras Horta, Henrique Autran, Alfredo Augusto da Matta47 and Eduardo Rabello, who in 1925 succeeded Fernando Terra as professor of dermatology at the Faculdade de Medicina do Rio de Janeiro and as president of the Sociedade Brasileira de
Dermatologia. But in 1926, another controversy developed within the Academia, overshadowing the debates over Lutz’ theory, when Belisário Penna, another future advocate of integralism, stubbornly advocated an intransigent policy of quarantining carriers of Hansen’s disease in leper colonies and leprosariums. Penna criticized the fact that, in all of the national forums where the problem had been debated, restrictions on the isolation of homes had been weakened.

“Leprosy,” Penna stated,

is not a disease of civilized countries, nor of savage ones. Among the savages there is no leprosy. Leprosy is characteristic and symbolic of countries in a semi-civilized state. Now, Brazil would like to be a civilized country and shouts about it every day, makes noises in the League of Nations. It needs, however, to demonstrate that it in fact is one ... We do not even need to leave the capital to find lepers everywhere. I saw a leper ... taking a bath at Post 6 in Copacaba, in the middle of everyone, and everyone was disturbed. I know a leper who sells newspapers ... And that’s how it is all over the place. ... It is not possible to continue on this way; it has become necessary to put up barricades to stem this avalanche that is dominating the country. (cited in Souza Araújo, 1956, p.417)

As Monteiro (2003, p.95-121) shows, after the revolution of 1930, the faction that advocated compulsory, unconditional quarantining of victims of Hansen’s disease assumed control over health policies in this area, not only in São Paulo but also in other Brazilian states.

Working against this tendency, Lutz continued to preach his conviction that the disease was transmitted by mosquitoes and therefore not contagious. In March, 1932, the Bulletin of an influential association created by ladies from the high society of São Paulo in 1926, the Society for Assistance to Lepers and for Fighting Leprosy, published the text of a lecture Lutz had delivered over Rádio Sociedade of Rio de Janeiro. He later returned to defending the position he had put forth in this lecture, in a conference held in Rio in September-October 1933, for the unification and uniformization of the Brazilian campaign against leprosy. The participants of this conference included government authorities and delegated from leagues and associations from all over Brazil. Lutz’ paper was published in the Sunday edition of two important Rio de Janeiro newspapers, Jornal do Commercio and Jornal do Brasil (Oct. 1, 1933).

Three years later, Lutz published an overview (in German, Portuguese, and English) of the literature on leprosy transmission, reviewed in French and Italian medical journals. Letters of support for his ideas came from around
the world, for instance, from Jesus M. Gomes, physician in Guindolim, a town in Goa, and from Dr. Peskcowski, director of the Krasnodar Experimental Leprosy Colony and Clinic, in the Soviet Union, who was responsible for epidemiological research into the disease in the area just east of the Azov and Black seas. Lutz sent a paper entitled “No control of leprosy without anti-mosquito campaign” to the International Congress in Cairo (Mar. 21-28, 1938). The disease was also the topic of the scientist’s final two papers, dictated to his niece since he was already completely blind. “A transmissão da lepra pelos mosquitos e a sua profilaxia,” read at the 7th Congress of the Pan American Medical Association in 1938, was published in Memórias do Instituto Oswaldo Cruz in November of the following year, while “Regras indispensáveis de prophylaxia anticulicidiana sugeridas ao Serviço Sanitário do Estado de S. Paulo” remained unpublished.
Lutz’ prevention recommendations, especially in his first article (1939), were now much more detailed and aimed primarily at “those who do not acknowledge the mosquito as the only means of transmission of leprosy.” The latter category may have included not only less unbending contagionists as well as physicians and researchers who considered that other vectors might be involved, such as the haematophagous fly *Musca sorbens* Wiedemann (Lamborn, 1937).

He recommended that there should be at least one person in every leprosarium undertaking constant prevention measures against mosquitoes. Furthermore, larger settlements should keep on staff an entomologist or physician qualified to raise the larvae found in infirmaries and lodgings, determine their species, and describe them in periodical reports to the institution. In regions where leprosy was found, a complete study of the local fauna of haematophagous Diptera and insects was indispensable in orienting anti-culicidian prophylaxis, which was “always useful, dispensing the need for justification.”

Patients’ medical histories should include information on their contact with mosquitoes in the places where they probably caught the infection. Those with fever or whose disease was progressing rapidly should be isolated in screened infirmaries. The patients’ lodgings should also have screens, and an effort should be made to eliminate dark corners, dark painting, and other “hiding places” for mosquitoes. Even though domestic species were the most likely suspects, leprosariums should be built where there were no infestations of marshland or wildland species.

In an article published in November 1939, Lutz also described in unprecedented detail the experiments meant to prove his theory:
Letter from Alice de Toledo Ribas Tibiriçá, President of “Lepers’ Assistance Societies and Defense against Leprosy Federation” to Dr. Adolpho Lutz inviting him to a conference to unify the criteria for the campaign against the disease.
BR.MN. Fundo Adolpho Lutz. Caixa 22, pasta 255.
The common nocturnal mosquito, *Culex quinquefasciatus*, must especially be suspected of transmitting leprosy but it does not lend itself easily to experiments because it only bites in the dark. It is best not to use *Stegomyia* for a variety of reasons. It is better to use species that bite readily ... for example, species from the genera *Mansonia*, *Taeniorhynchus*, and *Ianthinosoma*. The easiest to obtain is *Culex*, today *Ochlerotatus scapularis*, plentiful in tree-filled gardens.

The mosquitoes “should be” (or were)\(^5^1\) infected with a variety of microorganism species, not just “of the genus *Coccothrix* (1886), a name that has precedence over *Mycobacterium*,” but also of different “strains” of the tubercle bacillus—especially those associated with bovine or avian tuberculosis – and Stefansky’s bacillus, which in rats produced an “illness very similar to leprosy.”\(^5^2\)

Lutz recommended using cultures of these microorganisms, mixed with fresh defibrinated blood or diluted honey, to infect mosquitoes. The insects could also suck the germs directly from people or animals carrying the disease, but this method did not yield good results. In this case it would be better to use people or animals displaying recent and rapidly progressing pathological processes, with fever and the subsequent circulation of bacilli in their blood.

Many years ago I performed some experiments, applying mosquitoes to leprous tubercles, which are always full of acid-fast bacilli and usually form masses in zooglea. In my experiments, acid-fast bacilli were not found in mosquitoes. However, other observers seem to have been more successful. Today I attach little importance to these negative results because I believe that while acid-fast forms are convenient for diagnostics, they represent later, not very active stages.\(^5^3\)

For Lutz, the first question to resolve after infection of the mosquito was how long the bacilli remained alive in its body. Infected specimens should be kept alive for some time, “preferably completely in the dark,” to give the germ time to incubate. If it did not disappear from the internal organs quickly, these mosquitoes could be used in the inoculation of animals and in cultures attempted in succession. In animals, the salivary glands and the body should be inoculated in an effort to produce a lesion: guinea pigs and rabbits were susceptible to various forms of tuberculosis; rats, to Stefansky’s bacillus; and monkeys, to human leprosy.

Experiment with bites, which may be repeated, or by means of inoculations using mosquitoes ground up in a little liquid. They can be washed in alcohol and lightly singed to disinfect the external parts. This same process can also be used to inoculate appropriate nutritive media.
It would be good to repeat these experiments as often as possible in hopes of obtaining one or two positive results. It will suffice to obtain positive results with only one of these germs in order to demonstrate the possibility of mosquito transmission of *Coccothrix* species.

Adolpho Lutz passed away on October 6, 1940, a few weeks before his 85th birthday. His research program was carried on by Heraclides Cesar de Souza Araújo, head of the Leprology Laboratory at Instituto Oswaldo Cruz, and by Gustavo M. de Oliveira Castro, an entomologist at the same institute who had already published a number of papers in collaboration with Lutz. In a previous note published in 1945, with José Mariano, Oliveira Castro presented the results of the experiments performed with dozens of human volunteers to determine whether the proboscises of contaminated mosquitoes could infect the tissue they bit. The volunteers were all “negative” for leprosy, or “abacilliferous, with skin that is for the most part healthy and resistant to re-infections.” Based on the results of experiments with Culidae (mosquitoes), Ixodidae (ticks), Pediculidae (lice), Cimicidae (bedbugs), Pulicidae (fleas), and Triatominae (sub-family of Hemiptera, which includes the carrier of Chagas’ disease) conducted by these and by other researchers during the 1940s, Souza Araújo (1953, 1952) reached the conclusion that any haematophagous insect could transmit leprosy under certain conditions, and it would therefore be advisable for public health authorities to extend the fumigation program aimed at the malaria vector to include rural and suburban foci of Hansen’s disease.54 The leprologist from Manguinhos defended this thesis at the 10th Brazilian Congress on Hygiene, held in Belo Horizonte in October 1952, and at the 5th International Congress on Tropical Medicine and Malaria, which took place in Istanbul in August-September of 1953.

Adolpho Lutz’ ideas were defended before other audiences by his daughter, Bertha Lutz. During the seventeen months in which she held office as a legislative deputy (Partido Autonomista) for the Federal District, representing the Liga Eleitoral Independente (Independent Voters League), she urged that mosquitoes be combated as part of leprosy prophylaxis. She in fact lodged a petition with the House of Representatives, requesting information on the anti-culicidarian measures taken at the leprosariums and isolation hospitals then being created in different places around Brazil (Benchimol and Sá, Jan.-Apr. 2003, p.203-50).

World War II was a watershed in treatment of the disease. As of the 1940s, the use of compounds derived from diamino-diphenyl-sulphone (Promin, by
Photo 1 shows Sebastião and Benedita, spontaneously contaminated by Hansen’s bacillus, in Rola Moça, Bambuí, Minas Gerais, where Souza Araújo and his staff collected many Triatoma infestans, Chagas’ disease transmitter. Photo 2 shows Dr. Vandyck taking notes about J.A. Luz and his daughter, in Arraial da Mata, in São Gotardo, Minas Gerais, “the core of leprosy, Chagas disease transmitters and ticks”. Souza Araújo photos (1943, p.453a), on December 13 and 18, 1942.

Ten diseased people selected for the experimental contamination of mosquitoes in natural condition. In the photo, taken by Souza Araújo in March 1943, entomologist Oliveira Castro and guard Otto stand with the diseased by Rio do Peixe Lagoon. At this site, at sunset, the first mosquitoes contaminated with Hansen’s bacilli were collected at the very moment they were suching blood from the diseased (Souza Araújo, 1943b, p. 170, fig. 5).
Parke Davis; Diazone, by Abbot; Sulphetrone, by Burroughs Wellcome) would bring a cure to thousands of interned patients who began receiving their treatment in dispensaries, until they could be finally released after some years (Coutinho, 1957, p.321). These pages are not the place for a detailed investigation of all the chemical-pharmaceutical, socioeconomic, and political-cultural factors that made leprosariums and leper colonies obsolete, destined to decay or to be transformed into monuments meant for other purposes, among which preserving our memory of medical practices now fortunately left behind. But should you, the reader, happen to come across rusty screens protecting the doors and windows of one of these ghostly institutions, now you will know they represent prosaic vestiges of the ideas so fiercely defended by Adolpho Lutz. In this case, as in many others, the historian does not find the neat closing chapter always imagined to finalize scientific polemics, separating truth from error like wheat from the chaff.
specialty of dermatology, which was becoming established in a number of countries. Adolpho Lutz, we will look more carefully at his relationship with Unna and the role that both played in the medical world's greatest dermatologists (www.whonamedit.com/index.cfm). In the next volume of the Complete Works of and introduced new therapies. His book on histopathology, published in 1884, consolidated his prestige as one of the research on biochemical skin processes and discovered countries. Co-editor of Eimsbüttel, a suburb of Hamburg. The institution soon attracted a large number of students from Germany and other 1881, he founded a private dermatological clinic which three years later was moved to more modern facilities in Hamburg. In the summer of 1904, he traveled to Brazil with M. Otto to study yellow fever, shortly thereafter publishing (Sailors' Hospital) and the Institut für Schiffs und Tropenkrankheiten (Institute of Naval and Tropical Diseases), in Hamburg. His doctoral dissertation on the histology and history of the development of human epidermis (Archiv für mikroskopische Anatomie, 12, p.665, 1876) was a precursor to original approaches in the field of skin diseases. In 1881, he founded a private dermatological clinic which three years later was moved to more modern facilities in Eimsbüttel, a suburb of Hamburg. The institution soon attracted a large number of students from Germany and other countries. Co-editor of Internationaler Atlas seltener Hautkrankheiten (Hamburg and Leipzig, 1889-1899), Unna did research on biochemical skin processes and discovered Stratum granulosum. He described a number of diseases and introduced new therapies. His book on histopathology, published in 1884, consolidated his prestige as one of the world's greatest dermatologists (www.whonamedit.com/index.cfm). In the next volume of the Complete Works of Adolpho Lutz, we will look more carefully at his relationship with Unna and the role that both played in the medical specialty of dermatology, which was becoming established in a number of countries.

Notes

1 Although in Brazil and other nations the term 'Hansen's disease' has been adopted to refer to this illness as part of an effort to relieve its sufferers of the stigma associated with 'leprosy', we have nonetheless chosen to apply the word that was in current use during the historical period examined in these pages. From a historiographic perspective, a 'politically correct' stance would in this case yield an unacceptable anachronism. For more on the current implications of the use of the term "Hansen's disease" see Oliveira et al. (2003).


3 Obregón, 2000, p.266; Lutz, 1887. Originally published in Norsk Magazin for Lægevidenskaben (1874), Hansen's work was reprinted in 1955 by the Intern. Journ. of Leprosy. Obregón, currently one of the leading scholars on the history of leprosy, has just published a fine book on the topic (Medellin, 2002), and, more recently, an article on the campaign against the disease in Colombia (2003).

4 After testing it at Instituto Bacteriologico de Sao Paulo, Adolpho Lutz gave his negative opinion regarding the serum produced by Colombian physician Juan de Dios Carraquilla. Obregón's affirmation that the search for a vaccine against leprosy turned into "almost the only acceptable program of scientific investigation" (Obregón, 2000) does not apply to Brazil, albeit yellow fever was the object of intense research.

5 "Report on the status of Lazarus Hospital, prefaced by some considerations on morphea, its treatment, and experiments conducted at this hospital in 1869 by Dr. João Pereira Lopes" (in Port.), found in Lopes (1870) and partially transcribed in Souza Araújo (1946, p.463-71).

6 For a description of the cited papers, see Cruts (1965).

7 Before finishing his medical schooling in Strassbourg in 1875, Paul Gerson Unna (1850-1929) studied in Leipzig and Heidelberg. His doctoral dissertation on the histology and history of the development of human epidemis (Archiv für mikroskopische Anatomie, 12, p.665, 1876) was a precursor to original approaches in the field of skin diseases. In 1881, he founded a private dermatological clinic which three years later was moved to more modern facilities in Eimsbüttel, a suburb of Hamburg. The institution soon attracted a large number of students from Germany and other countries. Co-editor of Internationaler Atlas seltener Hautkrankheiten (Hamburg and Leipzig, 1889-1899), Unna did research on biochemical skin processes and discovered Stratum granulosum. He described a number of diseases and introduced new therapies. His book on histopathology, published in 1884, consolidated his prestige as one of the world's greatest dermatologists (www.whonamedit.com/index.cfm). In the next volume of the Complete Works of Adolpho Lutz, we will look more carefully at his relationship with Unna and the role that both played in the medical specialty of dermatology, which was becoming established in a number of countries.

8 Neumann was a professor at the University of Heidelberg and associated with both the Seemannskrankenhause (Sailors' Hospital) and the Institut für Schiffs und Tropenkrankheiten (Institute of Naval and Tropical Diseases), in Hamburg. In the summer of 1904, he traveled to Brazil with M. Otto to study yellow fever, shortly thereafter publishing Studien über das Gelbe Fieber in Brasilien (Leipzig, 1906).


10 See the bibliography on Adolpho Lutz edited by Herman Lent, in Neiva (1941). It was reprinted, with corrections and additions, in História, Ciências, Saúde – Manguinhos, 10:1, p.362-409.

11 BR. MN. Fundo Adolpho Lutz, pasta 255, maço 2.

12 On September 20, 1884, he inoculated Keanu, "rubbing pus from a leprous ulcer into blistering boils on his right arm and his ear. From a 9-year-old girl with tuberous leprosy he removed a leproma immediately after a bout with fever ... [this] was introduced into a long, deep incision in Keanu’s left forearm, and retained there by five stitches ... The following month, the patient began to feel rheumatoid pains; immediately thereafter, the cubital nerves began to become obstructed, this lasting until the 5th to the 8th month. ... On 9/25/1888, tuberous leprosy was quite marked in Keanu, and he was transferred to the leprosarium in Molokai" (Souza Araújo, 3.9.1936). The second controversial incident involving Aming was his examination and diagnosis of Father Damien, which will be discussed later.

13 As in Brazil, Chinese immigrants were considered by the Europeans and North Americans to be racially inferior, dirty, and sexually promiscuous, as well as having other physical and moral characteristics that jeopardized public hygiene (Obregón, 1996, p.165; Crosby, 1992, p.194; Gussow, 1988, p.96-7).

14 Letter from Emerson to Lutz, on November 6, 1888, partially transcribed by Corrêa (1992, p.145-6).

15 Letter to Emerson, dated June 2, 1888. According to Marcelo Oswaldo Álvares Corrêa (1992, p.144), the main source on this period of Lutz' life, his name had become known to Emerson by means of H. W. Schmidt, the Swedish and Norwegian Consul, who also had ties to a business, H. Hackfeld & Co. On May 5,1888, Unna wrote Lutz from Paris. He forwarded him a letter from Schmidt, on the subject of his trip to Hawaii, and left it to Lutz to decide what was best (BR. MN. Fundo Adolpho Lutz, pasta 252, maço 2). At the beginning of 1888, Emerson consulted Dr. Edward
Aming to find out whether he would like to resume his investigations, this time directed toward therapeutics, but Arning declined, saying that the disease was being studied by competent professionals in European medical centers that offered more advantageous conditions than Hawaii (Law, n.d., p.3, also hml.org/mmhc/mdindex/arning.html).

16 In the next volume of this collection, focusing on dermatology and mycology, we will analyze the meaning of this conference for Lutz and for the areas of medical-biological specialization with which he was involved.

17 At the Molokai community, a number of physicians served as directors: N. B. Emerson (1879), C. Neilson (1880-1881), G. L. Fitch (1882-1884), A. St. M. Mouritz (1884-1887), C. A. Peterson (1888), S. B. Swift (1889-1892) e E. Oliver (1892-1902) (Souza Araújo, 1929, p.83).

18 During a visit to Honolulu in January of 1885, Father Damien burned his leg and foot. The physician who examined him, Dr. George Trousseau, noted that he lacked sensation in his limbs. Dr. Edward Arning was called in, and he applied a strong electric current using a platinum needle placed in the leg. The fact that the priest did not feel this confirmed the death of the peroneal nerve, along with other ramifications, due to Hansen’s disease. Father Damien refused treatment by Arning at Kakako hospital. Source: hml.org/mmhc/mdindex/arning.html (consulted in February, 2003). On this subject, see also Obregón, 2002; Huenermann, 1953.

19 Law (n.d., p.1). Based, apparently, on the diary of Sister Leonilda Burns, this author affirms that Amy converted to Catholicism in order to win her patients' confidence, entering the Third Order of Saint Dominic only on the eve of her departure from England.

20 Also in Albuquerque (1950, p.11-2) we read that the trip through the United States had the air of a “triumphant procession.”

21 The other members of the Board were L. A. Thurston and S. M. Damon, whom she qualified as “excellent,” and W. E. Rowell and J. T. Waterhouse, who were described as “honorable;” Potter was merely a squire.

22 Born in the state of Maine, on July 9,1832, Kimball graduated from Harvard Medical School in 1857, and served in the U.S. Civil War (1861-1865) as a surgeon for the Union Army. Accompanied by his daughter, he arrived in Hawaii on June 11, 1882. In October, he was named government doctor of the Hilo district, in which post he remained until May, 1888. He also provided services to four large landowners in rural areas. Transferred to Honolulu, he became responsible for the capital’s dispensary until January, 1890, when he assumed the presidency of the Board of Health. He resigned from this position after the scandal involving Adolpho Lutz and Amy Fowler, which will be described here later, and returned to the United States. He died in Bridgton on June 20, 1902 (http://hml.org/mmhc/mdindex/arning.html; accessed on March 7, 2004).

23 Its members were John W. Kalua (president), A. P. Paehaole, H. G. Grabbe, WM. H. Halstead and T. R. Lucas. The last visit by the Board of Health committee, which included J. O. Carter and Waterhouse, occurred before the first visit by the legislative commission. Legislature of 1890. Select Committee on Complaint of Rose Gertrude in regard to Kalihi Hospital.

24 Legislature of 1890 (p.40-2). It was signed by Kalua, Paehaole, Crabbe and Halstead. In the “dissenting report,” Lucas endorsed the group’s conclusions but proposed that Kahalehili remain at the hospital under the authority of Lutz and Rose Gertrude, and that Reynolds maintain his position (ibid., p.43). Among the depositions taken by the commission, there are indications that the story about the indigenous woman’s lover who was committed by his brother, as told by Bertha Lutz may be true, but that the brother was not a priest but Carter himself, of the Board of Health.

25 These papers dealing with dermatology and mycology are examined in detail in the next volume of the Complete Works of Adolpho Lutz.

26 The arguments made by the author are based on a number of papers later written by Lutz. Presented in this form, they do not make it clear that the observations and hypotheses arose in Hawaii, nor how the theory that he would espouse so decidedly beginning in the 1910s was born and matured.

27 Aragão, 1915, cited in Souza Araújo, 1956, p.137, and Obregón, 2002. We have found only Leçons sur la syphilis, professées à l’hôpital Saint-Sauveur (Paris, 1886) by Henri Leloir. In a document from the Adolpho Lutz Archives ("Transmissão da lepra por mosquitos," caixa 19, pasta 74), Bertha Lutz wrote references apparently taken from Edvard Ehlers, "Transmissibilité de la lepre par les insectes succeurs de sang (parasites lectulaires)," in II Lépre Konferențe Mitteilungen u. Verhandlungen III. p.25-36. The list mentions a paper by Leloir entitled Traité pratique et théorique de la lépre (1886). It also includes Ashmead (although nothing other than the author’s name); Baldomero Sommer, "La leprie en Argentine," Semaine Médicale, 1898; articles by Blanchard but with no titles specified (see bibliography); Aming (Archiv. F. Dermat. U. Syph., 1891); Scott (British Medical Journal, Aug. 18-Sep. 23, 1900); Noc (Annales d’Hygiène et de Médecine Coloniale), Jul.-Sep. 1903, p.481; Jan.-Mar. 1904, p.11. More detailed references are provided by Chosky, author of Report on Leprosy and the homeless Lepers Asylum Matunga at Bombay (1901); Hallepeau, "Leçons cliniques de l’hôpital St. Louis," Bulletin de l’Académie de Médecine, Jul. 1901; Chantemesse (same publication, same session, Jul. 30, 1901); Pierre Cazamian, Archives de Médecine Navale, Dec. 1904, p.452; Goodhue, Indian Medical Gazette, Aug. 1906, and Journal of Tropical Medicine, Sep. 15, 1906; Marchoux and Bouret, Annales de l’Institut Pasteur, 19, 1908, p.389 and Bulletin de la Société de Pathologie Exotique, 1908, p.288; Laveran (same periodical, same session).
A helpful entry on Blanchard can be found at http://www.pasteur.fr/infosci/archives/f-bio.html. See also Brumpt (Feb. 13, 1910) and Linossier (Feb. 15, 1919).

This brochure was most likely “The mosquito as an agent for spreading yellow fever” (in Port.) by Emilio Ribas (1901), which transcribes a note by Adolpho Lutz. Lutz must have sent some of his works on leprosy, because the Frenchman comments in surprise (Oct. 1, 1905): “I was unaware that you had already pointed out the role of insects as infectious agents of leprosy. If there is a second edition of my book, I will not fail to mention this interesting fact. I am delighted to find myself in agreement with you on this point. I am more and more convinced that this is the only reasonable interpretation” (BR. MN. Fundo Adolpho Lutz, pasta 255, maço 1).

The report presented on July 28, 1897, to Emilio Ribas, director of São Paulo’s Sanitation Service, contains the results of an analysis of the material Lutz had received from Colombia shortly before his trip to Montevideo, where he attended the conference at which Giuseppe Sanarelli announced discovery of the ieroid bacillus, the presumed agent of yellow fever (Benichiml, 1999). The labels of the ten bottles were marked: “Instituto Carrasquilla – Suero antileproso [antileper serum] – Bogota – Plaza de los Mártires.” With the help of Arthur Mendoza, Lutz ascertained that all contained bacilli similar to coli, a larger bacillus, and cocci. They injected the serum into a dog and noticed no phenomena other than a bit of tumefaction.” Lutz judged it should not be used since it contained “several different organisms.” “As to its therapeutic actions,” he wrote, “we can say that the little we have found in literature provides absolutely no scientific basis for justifying any hope in this realm. This appears to be merely a work guided by no criteria, or of commercial speculation” (BR. MN. Fundo Adolpho Lutz, pasta 12, maço 1). Carrasquilla’s serum was widely accepted in Colombia, and the government of that country gave him an institute so he could continue his research. Prepared from the blood of infected patients, his serum was criticized by the international scientific community, including a number of participants at the Berlin congress, who argued that “Hansen’s bacillus is not found in the blood of patients” (Obregón, 2002, p.194-6).


In 1817, Enxadas Island, a storage place for gunpowder, provided temporary shelter to the ill who were transferred from the leprosarium in the neighborhood of São Cristóvão. The lepers were moved to Born Jesus Island, where they stayed until the construction of Lazarus Hospital was completed in 1850. Another island, Boa Viagem, in Niterói, was site of a pesthouse for seamen afflicted with contagious diseases. Created in 1510, shortly after the Portuguese Court moved to Brazil, this pesthouse was supported by daily fees paid by merchant marine ships docked in Guanabara Bay (Kushnir, 2002; Sarthou, 1964).

These words were pronounced by Emilio Gomes at the July 22, 1915 session of Brazil’s Academia Nacional de Medicina. They were published in the academy’s annals (v.81, p.161) and reproduced by Souza Araújo (1956, p.219, 303, 305, 332); Coutinho et al (2001, v.5, p.5890-2).

Hannaway (1993) names two works as the essential foundations of Germany’s medical geography: Leonhard Ludwig Finke’s, published in 1792-1795, and the two volumes that Hirsch published in the 1860s, on the eve of the Pasteurean revolution. In these pages, the German physician compiled a remarkable amount of data on the distribution and types of diseases during different periods and locales around the world and on the relation between these diseases and the environments in which their victims lived.

Among those defending the transmission of leprosy by fleas was Juan de Dios Carrasquilla, who advocated this theory at the 3rd Latin American Scientific Congress, held in Rio de Janeiro in 1905. In 1947, another Colombian physician, Guillermo Muñoz Rivas, won an award from Brazil’s Academia Nacional de Medicina for his work on the transmission of leprosy by fleas. Continuing with Carrasquilla’s line of study, Muñoz Rivas conducted a number of experiments with humans and canine fleas and ascertained that the leprosy bacilli remained in these insects’ digestive tubes for up to 76 hours (Obregón, 2002, p.173, 317).

Lutz attributed this discrepancy to the use of mosquito netting. No white person slept without one and even during daytime pyrethrum powders were widely used. The natives had no such habits. “On the other hand, the locals are very fond of water, and a lack of cleanliness cannot be alleged, as is always invoked, clouding the issue of disease transmission” (Jorn. Comm., Nov. 7, 1915).


On Dec. 3, 1915, Valverde questioned the analogy drawn between the processes by which leprosy and yellow fever are transmitted. “If one sole case of yellow fever, which only has the power to infect for three days, is enough to produce a pandemic, how can we allow that leprosy, with such a lengthy febrile period … can be transmitted so slowly and capriciously? Given the number of lepers around the world and the number of mosquitoes living in the world, if this theory were true, the world would be transformed into one huge leprosarium” (cited in Souza Araújo, 1956, p.132). The hardest blow against this aspect of Lutz’ theory came from a scientist at Instituto Oswaldo Cruz, leprologist Souza Araújo (1946, p.6). After examining venous blood from dozens of sick people who visited his office at this Institute between 1927 and 1929, he proved that “every lepromatous leper is constantly in a state of bacillemia, contrary to the classic notion defended … by Ad. Lutz, that this bacillemia only occurs during bouts of fever.”
or where he left long ago … It attacks precisely during periods reserved for rest, following the hours of work or study."

villages, becoming rare as housing is spread farther apart, and eventually not found at all where man has not yet arrived

Culex fatigans


Brasileira de Sciencias

Cruz

researchers, but this surely was the protocol for the experiments Lutz himself had been undertaking, which would justify

mosquitoes collected in Brazil. For five years, the two of them corresponded about the characteristics of the species they

had entrusted the task of writing a monograph about mosquitoes of the world. Theobald used Lutz' descriptions of

BR. MN. Fundo Adolpho Lutz, pasta 216). He devoted himself with great enthusiasm to the taxonomic study

of the group, and one of his main interlocutors was Frederick Theobald, the entomologist to whom the British Museum

had entrusted the task of writing a monograph about mosquitoes of the world. Theobald used Lutz' descriptions of

mosquitoes collected in Brazil. For five years, the two of them corresponded about the characteristics of the species they were studying (Sá, 2002).

Regarding the debates at the 5th Brazilian Congress of Medicine and Surgery, held in Rio de Janeiro in mid-1903, see

Benchmark (1999). "I am well aware that new ideas are always received with a certain caution, up to a point quite

acceptable," stated Aragão in December 1915, "but a great distance lies between this and assuming an unyielding

opposition … without taking into account the authority of who is presenting these. Unfortunately, this is what seems to be

the tendency concerning the culicidian doctrine of leprosy, repeating earlier campaigns against the culicidian theory of

malaria and yellow fever, and, in general, against all hypotheses about the spreading of diseases by an intermediary

host" (cited in Souza Araújo, 1956, p.137).

Emilio Gomes presented these "Conclusões aconselhadas pela Comissão de Prophylaxia da Lepra para servir de base a um projeto de lei" to Brazil’s Academia Nacional de Medicina. They were published in the academy’s Boletim, v.2, 1919, p.738-40 (cited in Souza-Araújo, v.III, p.159).

Delegates from Argentina, Colombia, Costa Rica, Cuba, Ecuador, the United States, Guatemala, Mexico, Panama, Paraguay, Peru, Uruguay, and Venezuela attended the conference, held in October 1922 at the National Exhibit’s Festival Pavilion, as part of Brazil’s Independence centennial celebrations (“Conferência Americana de Lepra,” Jom. Comm., Oct. 10, 1922).

Souza-Araújo (1956, p.365, 369, 371-2). The paper by Emilio Gomes there transcribed (p.368-71), was published in O Brazil-Medico (year XXXV, v.II, 10/28/1922, p.252); the final conclusions of the conference are contained in the same edition of the periodical (p.276). Lutz’ paper (1922) is not reproduced by Souza-Araújo and did not receive attention from the press; it did, however, create a “sensation” in the audience that applauded, that same night, the arrival of a telegram from Dr. Samuel Libânio telling of the inauguration of the cornerstone of Santa Isabel leprosarium in Belo Horizonte.

In an article published in 1929, this corresponding member of the Academy, who was a professor of hygiene at the pharmacy and agronomy schools in Manaus, did an inventory of the animals who were possible transmitters of leprosy, including rats. Without denying his contagionist convictions, he stated that the experimental evidence still did not support these "indirect contagions" but that it was advisable to take preventive measures.

"A transmissão da lepra e suas indicações profiláticas," published in May 1936 in Memórias do Instituto Oswaldo Cruz (in Port. and Eng.), is a short version of another, longer article, published in June in Annaes da Academia Brasileira de Ciencias (in German). It was reprinted in Boletim da Campanha contra a Lepra (May-Jun. 1936).

Unpublished typewritten text, 7 p. (BR. MN. Fundo Adolpho Lutz pasta 254, mafa 5).

BRMN Arquivo. Fundo Adolpho Lutz, pasta 254, mafa 4, together with correspondence between Bertha Lutz and Paula Souza about this contribution by Lutz.

We hesitate when it comes to the best verb to employ: the modal seems to address these instructions to other researchers, but this surely was the protocol for the experiments Lutz himself had been undertaking, which would justify using the simple past.

The existence of leprosy in rats was first mentioned in 1902, during a rat extermination campaign conducted in Ukraine. The following year, Stefansky identified Bacillus der Rattenlepra as its agent. The evolution of the disease in rats, as it was found in 1903 in the United Kingdom and then in most countries of the world, showed clinical and pathological similarities to leprosy in humans, with the result that for many years this bacillus was classified together with Mycobacterium leprae. Basing their position primarily on morphological arguments, in 1912 Marchoux and Sorel proposed (“Recherches sur la lépre”, Annales de l’Institut Pasteur, v.26, p.675-700) that it be denominated
Mycobacterium lepraemurium. Later, analyses involving molecular biology and antigens confirmed that the disease found in rats was due to a different species of microorganism than human leprosy. Stefansky’s bacillus, which was also responsible for “cat leprosy” (canine granulomatose leproid syndrome), fell, then, into synonymy. List of Bacterial names with Standing in Nomenclature (www.bacterio.cict.fr/bacdoc/mm/lepraemurium.html, term created on June 7, 1998, most recent modification made on Jan. 23, 2002).

53 “Acid fastness” is a property of Mycobacteria established by Paul Ehrlich in 1882. Tuberculosis and leprosy bacilli are hard to stain, but when dyed with gentian violet and saturated in aniline and water solution, they resist discoloration by mineral acids. This feature became the main way of distinguishing them from other microorganisms (Obregón, 2002, p.34).

54 Dr. Henrique Aragão and Dr. Herman Lent, protozoologist and entomologist at Instituto Oswaldo Cruz, worked together on these experiments. José Mariano and Ruy Noronha Miranda (director of São Roque Leprosarium in the state of Paraná) signed articles on the topic, in collaboration with Oliveira Castro and Souza Araújo. In his paper of 1952, Souza Araújo cited experiments by E. Montestruc and R. Blache (1951), in Martinique; Guillermo Muñoz Rivas (1946), in Colombia; and Celso S.C. Rossel (1947, 1946), at Instituto Oswaldo Cruz. He also referred to observations and materials sent to the Leprology Laboratory at Manguinhos by physicians working in different leprosariums around Brazil, all of whom were convinced of the role played by haematophagous insects in transmitting the disease. Max Rudolph, insectologist in Estrela do Sul (MG); Paulo Cerqueira, from Santa Isabel leprosarium; J.A. Soares, leprologist from Espírito Santo; Dr. Orestes Dioniz and Dr. Josefino Aleixo, who, together with Souza Araújo, visited lepers living in Bambuí, Minas Gerais, just before Centro de Estudos e Profilaxia da Molestia de Chagas was founded there in November 1943. Further on this topic, see Souza Araújo (1941; 1942a and b; 1943a, b, and c; 1944a and b); Oliveira Castro and Mariano (1944); and Rossell (1947, 1946).

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