Foreword
A physician, sanitarian and zoologist in the field

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Adolpho Lutz (1855-1940) was one of Brazil’s most versatile scientists. When in late 1908 he started working at Instituto Oswaldo Cruz, leaving Instituto Bacteriológico de São Paulo, which he had directed since 1893, he was already a seasoned professional who had amassed a considerable body of scientific work on all aspects of tropical medicine. The breadth of his interest made him the perfect protagonist of the quest to trace the development of scientific issues within the scope of tropical medicine from the last quarter of the 19th century to the mid 1900s. Lutz became familiar with many areas, both geographical – Rio de Janeiro, São Paulo, Europe, the United States, Oceania – and intellectual: clinical medicine, dermatology, mycology, helminthology, bacteriology, entomology, protozoology, malacology and veterinary science. He made lasting contributions to studies on glanders, trypanosomiasis, osteoporosis in equines, plasmodiosis in cows, parasitic diseases in wild and domestic animals, leprosy, ancylostomiasis, schistosomiasis, yellow fever, tuberculosis, skin diseases, malaria, etc.

As head of Instituto Bacteriológico de São Paulo, Lutz introduced measures which had a great impact on public health. At Instituto Oswaldo Cruz, he concentrated on research, providing a solid foundation for the training of the younger researchers and helping build up the biological collections, which grew with every new scientific expedition into lesser-known parts of Brazil.

In this book, we publish the accounts and findings of some of the field trips Lutz made, especially when he was at Instituto Oswaldo Cruz. As the (incomplete) list at the end of this foreword shows, the trips were the highlights of a career which combined concentrated periods of lab work with frequent field visits to collect biological material.

This book also contains some of the studies into animal diseases that concerned Lutz’s expedition to Pará state in 1907. Lutz is regarded as one of the pioneers of veterinary science in Brazil, thanks mostly to his work on helminthology, which is included in book 2, volume III of his Complete Works.

Another book in the present volume of this collection (volume III) will republish the article written by Lutz and Arthur Mendonça on glanders in São Paulo. It was originally published in 1896 by the Diario Official press in São Paulo, and in O Brazil-Médico (v.10, p.418-20), under the title “Trabalho do Instituto Bacteriológico do Estado de São Paulo” [Work
of the Bacteriological Institute of the State of São Paulo]. The reports Lutz wrote as director of this institute, included in the book in question, contain more information which goes towards explaining the role Lutz played in the consolidation of veterinary research in Brazil.

In the 1910s, the sanitarians and scientists at Instituto Oswaldo Cruz went on a number of missions to the interior of Brazil. In 1910, Oswaldo Cruz himself worked for the Madeira-Mamoré railroad, which was also known as the “devil’s railroad” because of its reputation for taking the life of one worker for every sleeper laid. In the report he submitted to the company in September, Oswaldo Cruz emphasized the seriousness of beriberi and pneumonia, but geared all the proposed preventative measures towards malaria, which affected 80-90% of the workforce.1 In October 1910, Cruz went to Belém with members of his mosquito extermination squad to embark on a campaign against yellow fever in the city. In early 1911, he was contracted by the Canadian Light and Power Company to inspect a plant being built in Ribeirão das Lajes, Rio de Janeiro state, which many accused of being responsible for the malaria epidemics breaking out in neighboring communities.

At this time, the rubber plantations run by the British in the Orient were starting to supplant Brazilian rubber production. In January 1912, Congress approved a plan designed to modernize extraction, processing and trade activities in the country, as well as the work processes themselves, including steps to reduce the very high death toll amongst the workers. Between October 1912 and March 1913, Carlos Chagas, Pacheco Leão, João Pedro de Albuquerque and a photographer visited part of the river system used by the rubber industry in the Amazon. At the same time, other expeditions from Instituto Oswaldo Cruz were visiting central and north-eastern Brazil. Between September 1911 and February 1912, Astrogildo Machado and Antônio Martins visited São Francisco and Tocantins valleys with teams from the Central do Brasil railroad to investigate the route for a new line between Minas Gerais to Pará states.

Three other teams were working for the Inspetoria de Obras contra as Secas [Inspectorate of Works to Combat Drought], which had been created in 1909 to support reforestation work, road, railroad and dam construction and the drilling of wells in the north-east’s arid region. From March to July 1912, João Pedro de Albuquerque and Gomes de Faria crossed Ceará and Piauí states, and between March and October, Artur Neiva and Belisário Pena covered seven thousand kilometers on horseback and mule in Bahia, Pernambuco, Piauí and Goiás states.2

Adolpho Lutz and Astrogildo Machado’s expedition was to inspect the São Francisco river watershed between April and June of that year. In 1915, the report on the trip was published in Portuguese in Memórias do Instituto Oswaldo Cruz (t. 7, n. 1, p. 5-50, 18 plates) under the title “Viagem pelo Rio S. Francisco e por alguns dos seus afluentes entre Pirapora e Joazeiro. Estudos feitos a requisição da Inspetoria das Obras Contra a Seca, direção do dr. Arrojado Lisboa” [Voyage down the São Francisco river and some of its tributaries between Pirapora and Juazeiro. Studies carried out at the request of the Inspetoria das Obras Contra a Seca, dr. Arrojado Lisboa, director].3

On the eve of this great scientific and sanitation offensive, the most experienced researchers from Instituto Oswaldo Cruz established detailed standards to be followed during the collection of zoological material and for observations of diseases encountered by the expedition members in Brazil’s interior, with special mention given to skin diseases and Chagas Disease. These “Instruções para colheita e conservação de material científico para estudo” [Instructions for the collection and preservation of scientific material for study] were divided into nine parts,4 the first of which explains how the skin diseases observed during the expedition were to be recorded. Adolpho Lutz may have helped write some of the sections (especially those concerning skin diseases and helminths), and was almost certainly the

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3 Bertha Lutz translated the report by Adolpho Lutz and Astrogildo Machado into English in or around 1955. It was the year in which the centenary of Adolpho Lutz’s birth was celebrated and the publication of all his scientific work was first considered. Details on the subject are found in BENCHIMOL, J. L., Sá, M. R., ANDRADE, M. M. de et al., “Bertha Lutz e a construção da memória de Adolpho Lutz”, História, Ciências, Saúde — Manguinhos, v. 10, n. 1, jan-abr, 2003, p. 203-50. Also available at http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0104-55702003000100007&lng=pt&nrm=iso.
4 The originals are at BR. MN. Fundo Adolpho Lutz, caixa 36, pasta 247. We do not have enough information to reliably identify the authors of the different sections.
author of the second part on insects – “Instruções para colheita e conservação de hematófagos” [Instructions for the collection and preservation of haematophagous] – which was published separately in leaflet form in 1912 and is reproduced in book 4, volume II of this collection (*Entomologia/ Entomology*, p.891-6). In it, the scientist draws attention to the main groups of animals that feed on the blood of birds and mammals: fleas and lice, as well as Diptera, including culicids, blackflies (simuliids), ceratopogonids, phlebotomine sandflies, tabanids and other flies. Ticks were also included, even though they are arachnids. The third part contained “Instructions for the study of the geographical distribution of parasitic thyroiditis”, which was then mistakenly taken as a sign of the disease recently discovered by Carlos Chagas. The fourth part concerned the “dosage of organic matter in water”; the fifth dealt with “mammals”; the sixth explained techniques for collecting and studying “protozoa”; the seventh was headed “Hygiene – Toxic plants – Epizootics”; the eighth contained “instructions for the collection, preservation and fixing of helminths”; and the ninth set out techniques for the “determination of the hydrotimetry of water”.

The instructions contained explanations of the different methods for collecting vertebrates and invertebrates. The former group covered different bird, reptile, fish and mammal species, including bats, rodents and even dolphins and the Amazonian manatee. As far as invertebrates were concerned, the expedition members’ attention was drawn to free-living protozoa or parasites that lived in the bloodstream, intestines and other organs of man and beast; helminths (nematodes, cestodes, trematodes and all their likely hosts); freshwater and saltwater mollusks; and arthropods, including crustaceans, spiders, scorpions and centipedes.

The medical and sanitary expeditions from Instituto Oswaldo Cruz did not put a stop to the debacle of the Amazonian rubber trade, nor did they convince the Old Republic and its wealthy landowners to face up to the perennial tragedy caused by droughts in the north-east. They did, however, provide the Manguinhos laboratories and other biomedical institutions with an invaluable set of observations and materials on Brazil’s pathologies. This data was applied to medical and public health research and boosted the increased autonomy of basic research within the fields of medical zoology and botany. The reports and iconography that the scientists produced form the first modern inventory of the health conditions of Brazil’s rural populations. They had a great impact on the ruling classes and
intelligentsia in the coastal cities, feeding into the discussions about the nationalist issue, which was starting to be reviewed in a dualistic light, with long-lasting repercussions on sociological thinking about Brazil. The patriotic extolment of a Brazilian civilization, which had reached new heights after the urban redevelopment of Rio de Janeiro, suffered a bitter blow as the degree of sickness and poverty in which the ‘other’ Brazil lived came to light. ⁵

Some books in volume II of the *Complete Works of Adolpho Lutz*⁶ contain or comment on the entomological research that resulted from Lutz’s collaboration with Arthur Neiva. What remains to be mentioned here is the striking contrast between the reports on the expeditions that Lutz went on with Astrogildo Machado and those by Neiva and Belisário Pena. Despite their mutual interest in the human and animal diseases that existed in the regions they visited, especially Chagas Disease, whose epidemiological reach was starting to be mapped out, what the report penned by Neiva and Pena shows is an exceptional wealth of sociological and anthropological observations about the communities living deep in Brazil’s inland regions. They are couched in passionate language and reveal the political engagement with the nationalist and civilizatory ideals expressed by the two scientists from Brazil’s most cosmopolitan urban center. In Adolpho Lutz’s text, human beings are almost always secondary, with the spotlight focused unswervingly on the animals and plants and the environments in which they coexisted, all described with the precision that was the hallmark of this doctor and zoologist of Swiss roots and Germanic culture and education, who now could also be considered a botanist.

When Oswaldo Cruz died on February 11, 1917, the institute he headed was the epicenter of a new, forthright generation of sanitarians, who led a vigorous movement for the modernization of Brazil’s sanitation services under the motto, “valuing man and the land”. They were led by Carlos

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Chagas, Oswaldo Cruz’s successor as the institute’s director from 1918 until his death in 1934, and by Belisário Pena, who would make his name as the unrelenting public figure at the helm of the Liga Pró-Saneamento [Pro-Sanitation League].7

Within this overall context, Lutz made two other journeys in 1918: one to northern Brazil to study schistosomiasis, and a voyage along Paraná river to Asuncion, with stops in Buenos Aires, Montevideo and Rio Grande.

During the First World War, the advances made by “Pasteur’s revolution” attenuated the devastation that infectious diseases could wreak, leaving the armed forces exposed to harm mostly from warfare itself. But this progress took a shocking step backward when the Spanish Flu pandemic ravaged the lives of at least 21 million people between 1918 and 1919.8 The tragic death toll in Brazil laid bare the medical profession’s inability to deal with the virus, an enemy that was as yet invisible to microbiologists. It revealed the dire state of sanitation and hospital services, which were only available in some coastal towns and cities, and heightened feelings against the oligarchs, which treated public health with such disdain. The military uprisings, the cries for reforms in other spheres of society, and the splits within the oligarchs themselves were the inevitable prelude to the 1930 Revolution, one of the ramifications of which was the creation of a Ministry for Education and Public Health, finally putting health centre-stage as worthy of nationwide policy-making.

But the most direct outcome of the movement led by the Liga Pró-Saneamento and the 1918 sanitation crisis was the creation of the Departamento Nacional de Saúde Pública [National Department of Public Health] in 1920-22. For the first time, a public entity was given powers that extended beyond isolated campaigns to fight epidemics in a handful of coastal towns. Longer-lasting projects of both a curative and preventative nature were set up to fight endemic diseases in rural and suburban areas, particularly ancylostomiasis (which had recently been

investigated by a delegation from the Rockefeller Foundation), malaria, leprosy, leishmaniasis, yellow fever and syphilis. As far as Chagas Disease was concerned, though the symbolic impact of its proven or purported symptoms — especially goiter and cretinism — so eloquently denoted the backwardness of Brazil’s semi-arid sertões, the disease was hotly debated by the medical profession, which goes some way towards explaining why so few measures were drawn up to deal with it during this period.

If for a time the epidemiological significance of this disease also known as American trypanosomiasis was lessened, at the very same time another disease that affected the sertão — schistosomiasis — was gaining increasing attention, with Adolfo Lutz as a key player.

In 1917, Lutz visited Rio Grande do Norte, Paraíba, Pernambuco, Sergipe and Bahia states with Oswino Álvares Penna to study the disease, whose occurrence in Brazil had been discovered ten years earlier by Bahian doctor Manuel Pirajá da Silva.

The person who first identified the worm that caused it was a German parasitologist, Theodor Bilharz. While in Cairo in 1851 with Wilhelm Griesinger, he had correlated the disease then recognized by the passing of blood in urine (haematuria) to a trematode he called *Schistosoma haematobium*. One of the features of its eggs is the presence of a terminal spine, which was later an element used in the species’ taxonomic identification. One year after its discovery, Bilharz identified eggs with a lateral spine in the females, but did not regard this as significant for differentiating a new species.

This morphological feature plus the fact that the eggs with a lateral spine were always found in the large intestine and the rectum led some physicians to cogitate the possibility that this might be a new worm, causing a different form of the disease. At the London School of Tropical Medicine, Patrick Manson was one of those who defended this viewpoint. His opinions were countered by renowned German helminthologist Arthur Looss, professor of biology and parasitology at the Cairo Medical School, who sustained that the eggs with a lateral spine were mere variants of

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Schistosoma haematobium, so much so that both forms coexisted in the main centers of the disease in sub-Saharan Africa.

In 1908, Pirajá da Silva published four papers on the subject in Brazil-Medico, based on material collected and analyzed in Bahia. His observations had international repercussions, first because they showed that the disease existed in Brazil, and also because they helped consolidate the Schistosoma mansoni species described in 1907 by Louis Sambon, named after Patrick Manson. Pirajá da Silva named the worm he found in Bahia Schistosoma americanum, though it was soon found to be the same species first described by the British.

A third species had been identified in Japan. Schistosomiasis there was known by the name of the district where Dairo Fujii had found it in 1874: Katayama disease. In 1904, Fujiro Katsurada related it to Schistosoma japonicum, and in 1913, Keinosuke Miyairi and M. Suzuki described its intermediate host: mollusks of the Biomphalaria genus. Miyaki and Suzuki also showed that the cercaria, the schistome’s larva, transmitted the disease to people when it burrowed beneath their skin.

It was in 1915 that the evolutionary cycles of S. mansoni and S. haematobium were first described by Robert Thompson Leiper (1881-1969).

Adolpho Lutz began his studies in Brazil a year later, first using material supplied by apprentices from the north-east at the Naval school in Rio de Janeiro. Not only did he confirm that schistosomiasis represented a serious public health problem in Brazil, but he also demonstrated the evolution of S. mansoni in snails of the Biomphalaria olivacea species, today named B. glabrata. With these studies, he came to discover a new intermediate host, the Biomphalaria straminea snail.

According to Deane (1955), Lutz was the first person to describe in detail the miracidium’s penetration into the mollusk, the formation of primary and secondary sporocysts, their migration to the host’s organs, where cercarias are produced, and their emergence from the body. Not only this, but he infested a number of rodent species under experimental conditions and studied the pathology in these animals and in humans.¹¹

When Lutz began this line of research, the findings obtained by Leiper had not yet been divulged widely, and almost nothing was known about the relationship between endoparasitic trematodes and mollusks in Brazil.

The previous book of his Complete Works (Helmintologia/Helminthology) reproduces the work Lutz performed prior to his 1917 trip into schistosomiasis and its worm, and also work which came to light after it. The next book (Outros estudos em zoologia/Other studies in zoology) will provide information about the groundbreaking work that Lutz published in 1918: “Caramujos da água doce do gênero Planorbis, observados no Brasil” [Fresh-water snails of the genus Planorbis observed in Brazil].

Corroborated in the 1940s by Emile Brumpt at the Pasteur Institute in Paris, Lutz’s studies became such comprehensive classics that, as Maria Deane (1955) notes, “nobody working on the subject today, especially in Brazil, can fail to know them in detail.”

The decision taken by Instituto Oswaldo Cruz to send an expedition to Alto Paraná and southern Mato Grosso to collect data and materials and investigate the sanitation conditions in the region seems to have come about after a request was received in early 1918 from the Paraná authority through Heraclides-Cezar de Souza Araujo, who then headed the state’s rural preventative medical service. Born in Paraná on June 24, 1886, Souza Araújo had graduated from Escola de Farmácia de Ouro Preto in 1912, and the following year did the specialization course at Instituto Oswaldo Cruz. Before embarking on his doctorate at Faculdade de Medicina do Rio de Janeiro in 1915, he took some disciplines at the medical faculty in Berlin (1913-14), including dermatology, which proved decisive for his subsequent specialization in leprosy.

As a resident physician at Hospital dos Lázaros de São Cristóvão in Rio de Janeiro between October 1915 and March 1916, he and the hospital’s director, Fernando Terra, carried out experiments with the leprosy vaccine developed by Rudolph Kraus, then the Director at the National Bacteriology Institute in Buenos Aires, and with chemical treatments prepared at Instituto Oswaldo Cruz by Astrogildo Machado. At the end of his residency, Souza Araújo was invited by the newly elected President of Paraná state, Affonso Camargo, to contribute to the sanitation of his home state. It was also in 1916 that Miguel Pereira, professor at Faculdade de Medicina do Rio de Janeiro, uttered the well-known phrase, “Brazil is a huge hospital”, foreshadowing the campaign that would be led by the Liga Pró-Saneamento do Brasil as of February 1918.

In May, June and July 1916, Souza Araújo worked on a census of
leprosy cases in Paraná. He published articles on his main interest, sanitation, in the Curitiba press and gave a talk to the Brazilian Society of Dermatology called “A lepra no Paraná e a sua profilaxia” [Leprosy in Paraná and its prevention]. On the request of Affonso Carmargo, he put together a plan for preventing the disease in the state and submitted it for appraisal by Oswaldo Cruz, who advised him, “if you do not prevent leprosy in your land, at least fight the worms and malaria along the state’s coast.”

After presidential decree 13.001 was passed on May 1, 1918, instituting the Serviço de Profilaxia Rural [Rural Disease Prevention Service], Souza-Araújo suggested to the head of the Paraná state executive that an agreement be set up with the government to establish a similar service in Paraná.

On January 16, 1918, on the eve of his appointment as chief of the Paraná state service, Souza Araújo, Adolpho Lutz, his assistant José de Vasconcellos, and another researcher from Instituto Oswaldo Cruz, Olympio Oliveira Ribeiro da Fonseca, set off from Estação da Luz station in São Paulo for Bauru, then voyaged up Paraná river to cross a little-known part of Brazil. Fonseca wrote:

“To get an idea of how little these central parts of South America were visited, suffice it to say that along the entire route, from Rebojo de Jupiá to Sete Quedas, the Paraná river was only reached on the Brazilian side by the Estrada de Ferro Noroeste railroad, which crossed it at that first point, and then only at a place named Porto Tibiriçá, by a cattle trail along which cattle would travel on foot from Mato Grosso to São Paulo on a journey lasting months. When we were in Três Lagoas, it was said and we were told that in the last ten years, the upper Paraná had only been descended once, and that by some young sportsmen from São Paulo, who voyaged in a sailing boat down the Tietê and Paraná rivers from that city until they reached Buenos Aires. Likewise, along the banks of the great river and in its vicinity between Jupiá and the Sete Quedas, only in Porto Tibiriçá did we encounter any habitation and dwellers who were not indians, with their tribal lifestyle and own languages.”

This comment can be found in A Escola de Manguinhos: contribuição para o estudo do desenvolvimento da medicina experimental no Brasil (1974, p.163), in which Fonseca published the journal recounting the journey made in 1918. Not only did he write it, but he seems to have taken the photographs, some of which illustrated the report published in

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Memórias do Instituto Oswaldo Cruz, t.X, fasc. 2, p.104-73 under the title “Viagem científica no rio Paraná e Assunción, com volta por Buenos Aires, Montevideo e Rio Grande” [Report on the journey down the river Paraná to Assuncion and the return journey over Buenos Aires, Montevideo and Rio Grande]. There, Fonseca only claims authorship of the chapter on protozoology and planktology, stating that “all the rest was written by Dr. Adolfo Lutz and Dr. Heraclides Cezar de Souza-Araujo.”

In 1925, Adolfo Lutz, now aged 70, spent almost six months in Venezuela accompanied by his assistant, Joaquim Venâncio Fernandes. They set off from Rio de Janeiro on Sunday, May 17 at 10 pm and started their return journey from La Guayra to the Brazilian capital on November 16, making a short stop-off in New York on the way.

Joaquim Venâncio Fernandes was born on May 23, 1895 on Bela Vista farm in Rio Novo, Minas Gerais state, which was owned by Carlos Chagas’s family. He joined Instituto Oswaldo Cruz whilst still a young man, in September 1916. Some time later he started working in Adolfo Lutz’s laboratory, where he showed himself to be a devoted assistant and highly skilled collector. He soon started to accompany Lutz on his trips, and after Lutz’s death in 1940 Fernandes continued to provide Bertha Lutz assistance in her field and laboratory work. He died on August 27, 1955.

The invitation to visit Venezuela came from General Juan Vicente Gómez (July 24, 1857 - December 17, 1935), who served as the nation’s President three times between 1908 and 1935. A cattle breeder, he supported General Cipriano Castro Ruiz (1858-1924), who governed the country between 1899 and 1908. He became his closest aid and in 1902 was appointed chief of the armed forces that spearheaded crackdowns on different political uprisings. Gómez took power in a coup d’état on December 19, 1908, while Castro was in Europe undergoing medical treatment. He managed to reduce Venezuela’s huge debt and finance an ambitious program of public works.

14 In the publication of the report in this book of the Complete Works of Adolfo Lutz, we reproduce many photographs not used in the original edition.

by granting contracts to foreign oil companies. On April 19, 1914, he handed over his office to a stand-in, Victoriano Márques Bustillos, though he continued to rule the nation from his home in Maracay. In 1922, he took over the presidency once again, remaining in office until April 22, 1929. Though he was reelected by Congress, he allowed Juan Bautista Pérez to succeed him. On June 13, 1931, Congress forced Pérez to step down and reelected Gómez, who this time saw his duties through until his death.

Though the paperwork for Lutz’s leave of absence from his position as service chief at Instituto Oswaldo Cruz states that his mission was to organize parasitology services for Venezuela’s Education Ministry, his journal shows that he devoted all his time in the country to laboratory and field work, often alongside other investigators, such as Enrique Tejera and especially Manuel Núñez Tovar (September 24, 1872 – January 27, 1928).

When Núñez Tovar graduated in medicine from Universidad Central de Venezuela in Caracas in 1895, he started to work as a clinician in Maturín. In 1909, the Monagas state government appointed him Director of a public hygiene committee, whose members also included Rafael Núñez Isava and César Flamerich. With the latter’s help, Núñez Tovar showed that many anemias incorrectly attributed to malaria were caused by *Ancylostoma duodenale* in the intestine. In the same year he also embarked on some entomological investigations, and was one of the first people to study Venezuela’s diptera.

In the mid 1910s, Núñez Tovar settled in Maracay, the capital city of Aragua state. He held the position of chief physician for the troops in the city’s garrison, but his most important work was in entomology. In November 1916, he sent a correspondence to the Venezuelan Medical Academy with a description of two *Anopheles* species captured for the first time in the country. Five years later, he gave a talk on *Insectos venezolanos transmisores de enfermedades* [Venezuelan disease-transmitting insects] at the third Venezuelan Medical Congress. At the following congress held in 1924, he presented *Mosquitos y flebotomos de Venezuela e Indice dipterológico de Venezuela con la contribución geográfica por estados* [The mosquitoes and phlebotomus of Venezuela and the incidence of Diptera in Venezuela with a geographical breakdown per state].

Throughout his career, he engaged eagerly with foreign researchers,
like Robert Newstead and his assistant, A. M. Evans, from the Liverpool School of Tropical Medicine. In 1927, he co-authored *Notas sobre insectos hematofagos de Venezuela: Diptera, Culicidae, Psychodidae* [Notes on the haematophagous insects of Venezuela: *Diptera, Culicidae, Psychodidae*] with US entomologist Harrison Gray Dyar.

Manuel Núñez Tovar put together a substantial collection of insects that is now kept in the Malariaiology and Environmental Sanitation section of Venezuela’s Ministry of Health. Tovar has a school and a university hospital named after him in Maturín, as well as some of the mosquito species he discovered.

His collaboration with Adolpho Lutz gave rise to “Contribución para el estudio de los dipteros hematófagos de Venezuela” [Contribution to the study of the haematophagous diptera of Venezuela]. It is part of *Estudios de zoología y parasitología venezolanas* [Studies into Venezuelan zoology and parasitology], which is republished in the present book of the *Complete Works of Adolpho Lutz*.

When Lutz returned to Brazil, he received 20,000 Bolivares from the Venezuelan government to pay for the publication of the book. The translation from Portuguese to Spanish was by Juan Tremoleras and the illustrators were Raymundo Honório, P. Sandig and Rudolph Fischer. Brazil’s Museu Nacional (BR. MN.), Fundo Adolpho Lutz, caixa 34, pasta 244, maço 3 contains the promissory notes and receipts issued by Companhia Lithographica Ypiranga, a printing company based in São Paulo with an office in Rio de Janeiro, for 550 copies of the book on satin finish paper and 50 on art paper. The printing service was started in September 1927 and the final copies were received in February 1929. According to Bertha Lutz, the money received from Venezuela was enough to cover the cost of sending 500 copies to Trinidad, but practically the whole print run was lost, and today it is hard to find traces of even then 100 copies that Lutz kept.

As shown in “Bertha Lutz e a construção da memória de Adolpho Lutz” [Bertha Lutz and the memory of Adolpho Lutz], in 1955, on the centennial of Adolpho Lutz’s birth, there was talk of publishing his entire body of work, and Bertha and Gualter Adolpho Lutz even prepared a number of...

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texts with a view to taking the project forward. Though it did not realize its initial aim, the Centennial Committee, formed by the recently established Conselho Nacional de Pesquisas [National Research Council], did have some positive results. One of the fruits of Bertha Lutz’s efforts to preserve her father’s scientific output was the reprinting in Caracas in December 1955 of Estudios de zoología y parasitología venezolanas, which was paid for by Universidad Central de Venezuela.

This could not have been done without the support provided by Enrique Guillermo Vogelsang (March 5, 1899-1969), who wrote the preface to the new edition. Born in Montevideo, Vogelsang graduated from the Uruguayan capital’s Veterinary College. He went on to specialize in parasitology and animal pathology at the Institute for Tropical Medicine in Hamburg, and moved to Venezuela in 1931. One of the precursors of veterinary medicine in the country, he first worked as a veterinarian at Hipódromo del Paraíso in Caracas, and then for the Venezuelan army, where he rose to the rank of Colonel. He was a teacher at Escuela Práctica de Agricultura la Providencia in Maracay at the time of Adolpho Lutz’s visit.

In 1938, together with other foreign professors, he helped set up a veterinary college in Maracay, which is today the Facultad de Ciencias Veterinarias pertaining to Universidad Central de Venezuela (UCV). He became director of the institution and was also founder and director of the Venezuela’s Veterinary Medical Society. In 1939, he set up Revista de Medicina Veterinaria y Parasitología with Piero Gallo, which was later renamed Revista de la Facultad de Veterinaria of UCV. The pages of the periodical carried Vogelsang’s groundbreaking studies into a range of diseases, such as brucellosis, equine osteoporosis, foot-and-mouth disease, bovine tuberculosis and diseases affecting domestic and wild animals caused by endoparasites. Alongside parasitologist J. A. Travassos Santos, Vogelsang was also one of the first to study ticks in Venezuela.


The documents relating to Adolpho Lutz’s visit to Venezuela are
supplemented by three unpublished texts: “Notas sobre a visita do professor Adolpho Lutz à Venezuela”, written by Bertha Lutz in 1955; “Diário de viagem à Venezuela”, handwritten by Adolpho Lutz; and the speech he gave on November 9, 1925 at Universidad Central de Venezuela, which appeared in *El Universal*, a Caracas-based journal. These texts and the photographs and postcards that are partially reproduced here can all be found at BR. MN. Fundo Adolpho Lutz, BR. MN. Fundo Adolpho Lutz, caixa 34, pasta 244, maço 3.

During his journeys, Lutz always showed curiosity about different zoological and botanical groups, especially those related to the studies into parasitology he had been conducting since the 1880s. He searched for ecto and endoparasites of distinct phyla and classes. Not only did he identify the fauna and flora of the places he visited, but he also scrutinized the interrelations between animals, plants, their parasites and the environment which they co-inhabited. It is no surprise that Arthur Neiva dubbed him a “genuine naturalist of the old Darwinian school”.

On his first north-eastern trip in 1912, Lutz set about making an exhaustive inventory of the wildlife, observing all the life forms from mammals down to a zoological group thus far little studied or known: freshwater sponges, sessile benthonic creatures (i.e. fixed to the substrate) which were generally sustained by a mineral skeleton made up of spicules of silicon or calcite, whose size could vary from a few millimeters to centimeters. Lutz’s curiosity about these creatures was of a purely zoological nature, since at the time they were not thought to be of any medical interest. When Lutz made his second trip to the north-east five years later, he focused exclusively on parasitology and medical entomology. By this time, it was less commonplace to investigate the natural history of the places visited than had been the case during the pioneering years of

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18 Sponges (phylum Porifera) are filter feeders whose structure and physiology are very simple. See [http://acd.ufjf.br/labpor/1-Esponjas/Esponjas.htm](http://acd.ufjf.br/labpor/1-Esponjas/Esponjas.htm).
tropical medicine. Now, what mattered was to understand how schistosomes developed in their hosts and to find mollusks that served as vectors for the human disease, schistosomiasis.

As the travelers crossed virtually uncharted lands on their voyage along Paraná river to Asuncion, a fresh desire was awakened in them to list and catalog the fauna and flora, their parasites and the relationships between these and the environment. They collected a number of new protozoan and helminth species, as well as plankton, which was a significant component in the intricate web of relations connecting the wildlife in the fluvial ecosystems they encountered. Plankton had first been studied at Manguinhos in 1908 by Czech protozoologist Stanislas von Prowazek, and the line of research had become established at the institute thanks to the work of Gomes de Faria, Aristides Marques da Cunha and Olympio da Fonseca himself. These three researchers made up part of the Marine Biological Station, founded in 1912 by the Ministry of Agriculture at Praia Vermelha, Rio de Janeiro, and headed by Alípio de Miranda Ribeiro, a zoologist from the Museu Nacional. In 1916, the station was transferred to Instituto Oswaldo Cruz, where investigations were pursued into the plankton living off the Brazilian coastline. The material collected on the 1918 trip deepened the understanding of the community of tiny animals and vegetables inhabiting the waters off the South American coast from Rio de Janeiro to Mar del Plata in Argentina.

In true style, the traveling naturalists who went on the 1918 expedition also made sure to collect indigenous artifacts, which they deposited at the Museu Nacional do Rio de Janeiro, and they took photographs to document the features of the land they traveled through.

It was on this trip that amphibians first gained importance; they were to become one of Adolpho Lutz’s chief research subjects during the following two decades. In Venezuela in 1926, amphibians show already relative precedence over other zoological groups, all of which, however, were always examined as reservoirs for worms and other parasites. These studies into parasitology formed the backbone of the research program that Lutz put together in that country.

The next book of the Complete Works of Adolpho Lutz contains the work the scientist published on amphibians, some of it in partnership with his daughter, Bertha Lutz, who herself became a zoologist and expert on these animals at Museu Nacional.
In July 1927, Adolpho Lutz, his daughter Bertha Lutz, and his research assistant Joaquim Venâncio traveled to Rio Grande do Norte on the invitation of the state’s President, Juvenal Lamartine de Farias (1874-1956). According to the address given by Farias on his administration’s activities during the three-year period from 1928 to 1930 (http://brazil.crl.edu/bsd/bsd/u747/000068.html), in March 1928 they had signed an agreement with the Departamento Nacional de Saúde Pública [National Department of Public Health] to receive funds from the national treasury for rural sanitation and services for the prevention of leprosy and venereal disease. The local rural sanitation committee headed by Waldemar Antunes had one mobile unit, one permanent unit in Ceará-Mirim, as well as a leprosy service, a pre-natal service, a radiology room, a bacteriology laboratory and a pharmacy section, all in the state capital, Natal.

Adolpho Lutz had visited Rio Grande do Norte once before with Oswino Álvares Penna in 1917, when they were looking into schistosomiasis in north-eastern Brazil. This new visit seems to have been related to the state’s rural sanitation problems and its agents, but Lutz approached it from much more of a zoological than a medical or sanitation stance, still showing great interest in the mollusks that were intermediate hosts for schistosomes. He was fascinated by the amphibians which he studied together with his daughter, and by other specimens of fauna and flora that he collected and examined to from a helminthological, entomological and botanical perspective.


The contents of the official report derive from “Notas da viagem para Natal e parte do Estado do Rio Grande do Norte” [Notes from the journey to Natal and part of Rio Grande do Norte state], an unpublished document comprising eight typewritten papers with some handwritten notes and
drawings. This document was created from a journal kept by hand in a 46-page notebook, whose opposite end contains notes on another excursion made in February 1928 to Bonito, Ponte Alta and Pinheiros river in Rio de Janeiro and São Paulo states. Both documents are kept at BR.MN. Fundo Adolpho Lutz, caixa 15, pasta 101. The first page of A Republica, dated July 8, 1928 and entitled “Natal recebe a visita da leader do feminismo no Brasil” [Natal receives visit from the leader of feminism in Brazil], tells of the Lutzes’ arrival. While Adolpho returned to Rio de Janeiro on August 11, Bertha stayed on, filling her time with a busy schedule of visits to towns in the interior, a number of talks, participation in openings and, alongside writer and folklorist Luís da Câmara Cascudo, attendance at a traditional fête, or arraial junino. As the state president’s address explains, she was a member of a committee from the Ministry of Agriculture that had come to study the local wildlife, and was “taking the opportunity to give a number of political and social talks designed to interest the women from Rio Grande do Norte in our political and economic issues,” (p. 68).

It is clear from the articles published in A República that Adolpho Lutz paled in comparison with his daughter, “defender of the Brazilian feminist movement”. Bertha Lutz was one of the key figures in the campaign for women’s suffrage, which had started to be discussed in Brazil’s political arena in the 1920s, especially after the establishment of the Federação Brasileira pelo Progresso Feminino [Brazilian Federation for the Progress of Women]. In October 1922, the Congresso Jurídico Brasileiro [Brazilian Legal Congress] had upheld the constitutionality of the vote for women. In 1926, the Minas Gerais State Congress had started to debate a reform of its Constitution to allow women the right to vote and stand as candidates in statewide elections. The following year, when Juvenal Lamartine de Faria, then a Federal Deputy and a supporter of women’s suffrage, had announced that he would run for President of Rio Grande do Norte state, he had promised women comprehensive political rights. In that very year in Mossoró, Celina Guimarães was the first woman ever to register on an electoral roll. Even before Faria took over as President of Rio Grande do Norte, he brought in the necessary changes to the state’s electoral legislation and in 1928, with his support, Alzira Soriano de Souza was voted in Mayor of Lajes: Brazil’s first female mayor.20

It is therefore no great surprise that Bertha Lutz and feminism were the object of the greater interest of both the press and the ruling classes in Rio Grande do Norte throughout her stay with her father in Natal.

Another topic that recurs in the documents pertaining to the Lutzes’ visit is aviation. Father and daughter reached Natal on board a plane owned by Compagnie Generale Aero-Postale, landing at the recently opened Parnamirim airfield. The scientist’s journal and speech, republished in this book, leave no doubt as to the impact of his experience of this revolutionary means of transport.

In 1927, the French army had established a shipping line between Natal and the Senegalese capital, Dacar. Their aim was to collect meteorological data for a future air route, which formed the beginnings of today’s Air France. Juvenal Lamartine de Farias boasted that Natal was regarded as “the favorite spot in the South American continent for the landing of transatlantic airplanes and hydroplanes, giving it the deserved title of ‘Europe’s wharf,’” (Mensagem, p.68). His words are a clear reflection of the frontiers that were being pushed back by intrepid and heroic deeds.

In 1918, Pierre Georges Latécoère had submitted a proposal to the French Ministry of Aeronautics for a three-part link between France and South America: Toulouse–Casablanca, Casablanca–Dacar, and Natal–Buenos-Aires, via Rio de Janeiro, though an Atlantic air crossing was not yet considered feasible. In November 1927, an airlink was established between Natal, Rio de Janeiro and Buenos Aires, and in March 1928, the first postal service between France and South America was set up. Until 1935, the crossing between Dacar and Natal used packet ships, after which time hydroplanes were introduced.21

On July 6, just two days before the Lutzes’ arrival, the Savoia-Marchetti S-64, flown by Arturo Ferrarin and Carlo Del Prete, had landed on Touros beach, 90 km from Natal. The monoplane had been built by Fiat especially for the Italian pilots to make the first crossing of the Atlantic between Italy and Brazil with no stopovers. The itinerary was: Rome, Cagliari (Italy), Algeria, Melilla (Spain), Gibraltar, the Canary Islands, Cape Verde and Brazil. On July 3, 1928, the Savoia-Marchetti took off from Montecelio aerodrome in Rome. The Italian pilots’ first message upon reaching

Brazilian territory was received on July 6. Ferrarin and Del Prete had flown some 7,163 km in 49 hours 19 minutes, setting a new world distance record. The plane was damaged as it landed on Touros beach and had to be transported at great cost to Natal. Adolpho and Bertha Lutz certainly took part in the tributes and events put on to celebrate Ferrarin and Del Prete’s feat. On July 31, the two aviators set off for Rio de Janeiro on board a French plane, Latécoère. After making some eventful stops along the way in Recife, Maceió, Aracaju and Camaçari (in Bahia), they reached the Brazilian capital seven days later on a sunny Sunday morning. Their aircraft, the Savoia-Marchetti S-62, awaited them for the resumption of their journey to the Italian colonies in southern Brazil. However, they had an accident as they were making a test flight over Guanabara bay in Rio de Janeiro. Badly injured, Del Prete had both his legs amputated, but his condition deteriorated and he eventually died on August 16, 1928.22

On his return from Rio Grande do Norte, Adolpho Lutz warned the Brazilian authorities of the danger that insects of medical concern to Brazil could find their way into the country from western Africa. And in March 1930, Anopheles gambiae was indeed identified in Natal by Raymond Shannon, who was an entomologist working for the Yellow Fever Service. In a telegram he sent to the Rockefeller Foundation on September 30, he said he had “found gambiae in Natal. Poor Brazil!”23 Though the infested area was still relatively small, the malaria epidemic affected huge numbers of people and was commonly mistaken for yellow fever.

In 1938, as jungle yellow fever swept across central and southern Brazil, the malaria’s African vector brought on a crisis of catastrophic proportions in Rio Grande do Norte and Ceará. Of the former state’s 240,000 inhabitants, around 50,000 were infected with the disease and five thousand lost their lives. In July, malaria reached Jaguaribe valley in Ceará, where it afflicted more than 63,000 people, killing eight thousand. Some municipalities saw more than 90% of their population wiped out by the disease. Meanwhile, rumors of a possible second World War were gaining force and epidemiological studies showed that malaria would be

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22 For more on this see the excellent article by Isabel Lustosa, “Esses bravos heróis dos ares”, Nossa História, ano 1, n.2, dez. 2003. Available at http://www.nossahistoria.net/Default.aspx?PortalId=-1&TabId=-1&MenuId=-1&pagId=DNGCVJRI (consulted in January 2007).

the biggest sanitation threat to the warring forces. In view of the potential for *Anopheles gambiae* to spread across the Amazon region and reach the Panama canal, the US quickly showed a keen interest in the problem affecting Brazil’s northeastern region. The Serviço de Malária do Nordeste [Northeast Malaria Service] was set up in August 1938 and reformed the following January with money and staff from the Brazilian government and the Rockefeller Foundation and was swift and effective in eradicating the African host of malaria in Brazil.24

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Trips and Expeditions taken by Adolfo Lutz  
As Director of the Instituto Bacteriológico de São Paulo (1893-1908)

<table>
<thead>
<tr>
<th>Year</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>1897</td>
<td>May to June: as the official delegate for São Paulo, attended Giuseppe Sanarelli’s talk and experiments concerning the yellow fever bacillus at Instituto de Higiene Experimental, Montevideo, Uruguay.</td>
</tr>
<tr>
<td>1898</td>
<td>February: member of committee from the Serviço Sanitário de São Paulo to assess the efficacy of the serum developed by Sanarelli on patients with yellow fever in S. Carlos do Pinhal (São Paulo state).</td>
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<tr>
<td>1900</td>
<td>September: expedition to the research station in Rio Grande to study Culicidae.</td>
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<tr>
<td>1901</td>
<td>February: expedition to Guatapará to study malaria along the banks of Mogi Guaçu river.</td>
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<tr>
<td>1902</td>
<td>April 28 to May 15: studied malaria in Batatais, along the banks of Sapucaí river, and in Vassoural, Entroncamento and Ribeirão Preto, São Paulo state.</td>
</tr>
<tr>
<td>1904</td>
<td>January 5 to 13: expedition to Salesópolis to examine the waters of São João and Ribeirinhos rivers, which flow into Tietê river, which the government was offered as a water supply for São Paulo city.</td>
</tr>
<tr>
<td>1905</td>
<td>September 1, 1905 to February 12, 1906: expedition to Paris as representative of São Paulo state at the International Congress for Tuberculosis.</td>
</tr>
<tr>
<td>1907</td>
<td>August 4 to December 30: expedition to Marajó island on the invitation of the Pará state government to study surra.</td>
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As a researcher at Instituto Oswaldo Cruz (1908-1940)

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
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<tbody>
<tr>
<td>1912</td>
<td>May 1 to July 8: voyage down São Francisco river.</td>
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<tr>
<td>1913</td>
<td>January 15 to 30: expedition to Bonito farm, Serra da Bocaina.</td>
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<tr>
<td></td>
<td>February: excursion to Pacau, in Serra de Mantiqueira mountains, Minas Gerais state.</td>
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<tr>
<td></td>
<td>April: excursion to Bonito farm, Serra da Bocaina.</td>
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<tr>
<td></td>
<td>September and October: excursion to Bonito farm, Serra da Bocaina.</td>
</tr>
<tr>
<td></td>
<td>October: excursion to Itatiaia, Serra da Mantiqueira.</td>
</tr>
<tr>
<td>1914</td>
<td>January 3 to 30: expedition to São Bento, Santa Catarina state.</td>
</tr>
<tr>
<td></td>
<td>February: excursion to Pacau, Serra de Mantiqueira, Minas Gerais state.</td>
</tr>
<tr>
<td></td>
<td>March: excursion to Bonito farm and Serra da Bocaina.</td>
</tr>
<tr>
<td>1915</td>
<td>February: excursion to Bonito farm and Serra da Bocaina.</td>
</tr>
<tr>
<td></td>
<td>June: excursion to Bonito farm and Serra da Bocaina.</td>
</tr>
<tr>
<td></td>
<td>December 29 to 31: excursion to Passa Quatro, Minas Gerais state.</td>
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<tr>
<td></td>
<td>March to April 8: expedition to Capela Nova do Betim and Belo Horizonte, Minas Gerais state.</td>
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<tr>
<td>1916</td>
<td>September 8: excursion to Juiz de Fora and Lassance, Minas Gerais state.</td>
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<tr>
<td>1917</td>
<td>February: excursion to Bonito farm and Serra da Bocaina.</td>
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<tr>
<td></td>
<td>March 5 to 14: expedition to the Caparão plains, Minas Gerais state.</td>
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<tr>
<td></td>
<td>August 5 to October 11: trip to the north-east (Espírito Santo, Bahia, Pernambuco etc.).</td>
</tr>
<tr>
<td>1918</td>
<td>January 17 to March 5: voyage down Paraná river and to Assuncion.</td>
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</tbody>
</table>
1919  November 1 to 21: trip to Minas Gerais with Dr. J. Chester Bradley: Lassance, Serra de Santa Maria, Diamantina. December 9 to 19: expedition to Lassance and Serra do Cabral, Minas Gerais state.

1920  October: trip to Montevideo; Brazilian delegate to the 2nd South American Congress for Dermatology and Syphilography.


1924  December 2 to 8: trip to Belo Horizonte, Minas Gerais state.

1925  January: excursion to Serra da Bocaina. May 17 to December 17: trip to Venezuela, stopover in Nova York on the way back to Brazil.

1927  May 27 to 30: participation in the bicentennial of the American Philosophical Society in Philadelphia, USA.


1930  December: expedition to Serra da Bocaina.

1933  March: expedition to Serra da Bocaina.