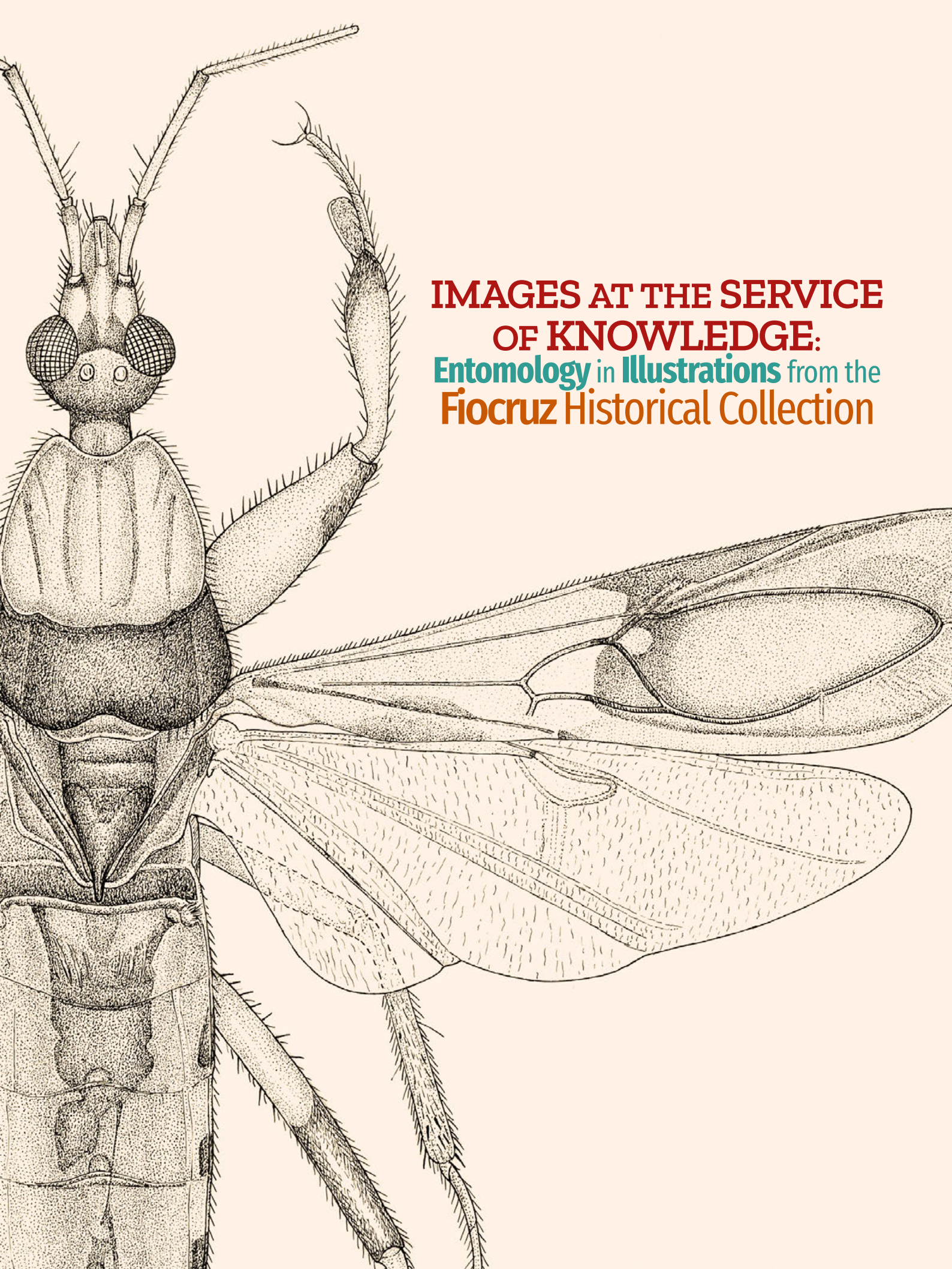
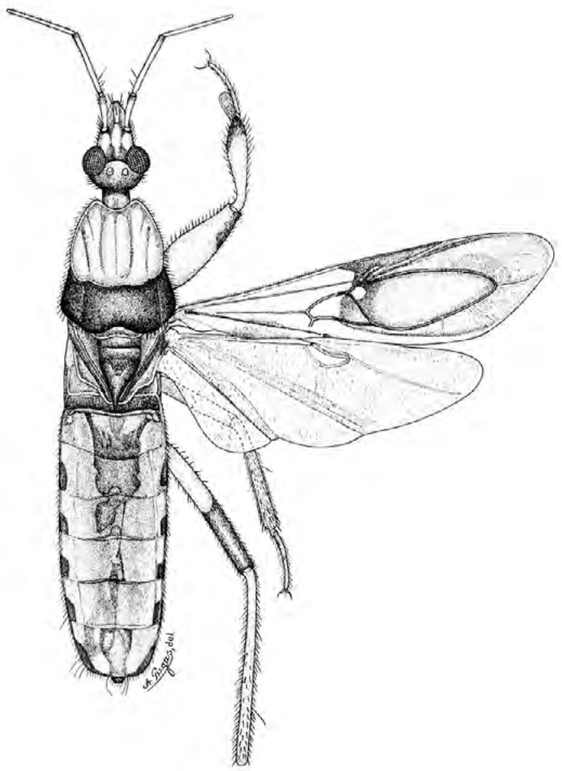


IMAGES AT THE SERVICE OF KNOWLEDGE: Entomology in Illustrations from the Fiocruz Historical Collection



Aline Lopes de Lacerda
Ana Luce Girão Soares de Lima
Felipe Almeida Vieira
Francisco dos Santos Lourenço
Regina Celie Simões Marques

Editors

IMAGES AT THE SERVICE OF KNOWLEDGE: Entomology in Illustrations from the Fiocruz Historical Collection

Translate by Diane Grosklaus Whitty

Fundação Oswaldo Cruz – Casa de Oswaldo Cruz
Rio de Janeiro
2022

President of Fundação Oswaldo Cruz
Nísia Trindade Lima

Director of Casa de Oswaldo Cruz
Marcos José de Araújo Pinheiro

Head of Departamento de Arquivo e Documentação
Ana Roberta de Souza Tartaglia

Head of Serviço de Arquivo Histórico
Felipe Almeida Vieira

Editors
Aline Lopes de Lacerda
Ana Luce Girão Soares de Lima
Felipe Almeida Vieira
Francisco dos Santos Lourenço
Regina Celie Simões Marques

Research scholarship
Carlos Raphael Oliveira do Rego
Jessica Ellen Fernandes da Silva
Lara Rodrigues de Brito Pinheiro
Maria Carolina Silva Borges
Mylena da Silva Domingues

Consultants
Eduardo Vilela Thielen – Instituto de Comunicação e Informação Científica e Tecnológica em Saúde/Fiocruz
Felipe Ferraz Figueiredo Moreira – Instituto Oswaldo Cruz/Fiocruz
José Jurberg – Instituto Oswaldo Cruz/Fiocruz
Luiz Antonio Alves Costa – Museu Nacional/UFRJ
Magali Romero Sá – Casa de Oswaldo Cruz/Fiocruz
Márcio Felix – Instituto Oswaldo Cruz/Fiocruz

Digitalizations of images
Roberto Jesus Oscar
Vinícius Pequeno

Graphic design and image treatment
Fernando Vasconcelos

Acknowledgments
Biblioteca de História das Ciências e da Saúde/Casa de Oswaldo Cruz/Fiocruz
Centro de Ciências da Saúde/UFRJ
Centro de Memória/Instituto Biológico
Coordenação Geral de Gestão de Pessoas/Fiocruz
Departamento de Arquivo e Documentação/Casa de Oswaldo Cruz/Fiocruz
Instituto de Pesquisas Jardim Botânico do Rio de Janeiro

I31 Images at the service of knowledge : entomology in illustrations from the Fiocruz Historical Collection / editado por Aline Lopes de Lacerda et al. – Rio de Janeiro: Fiocruz/COC, 2022.
Edição digital.

Possui versão em Português.

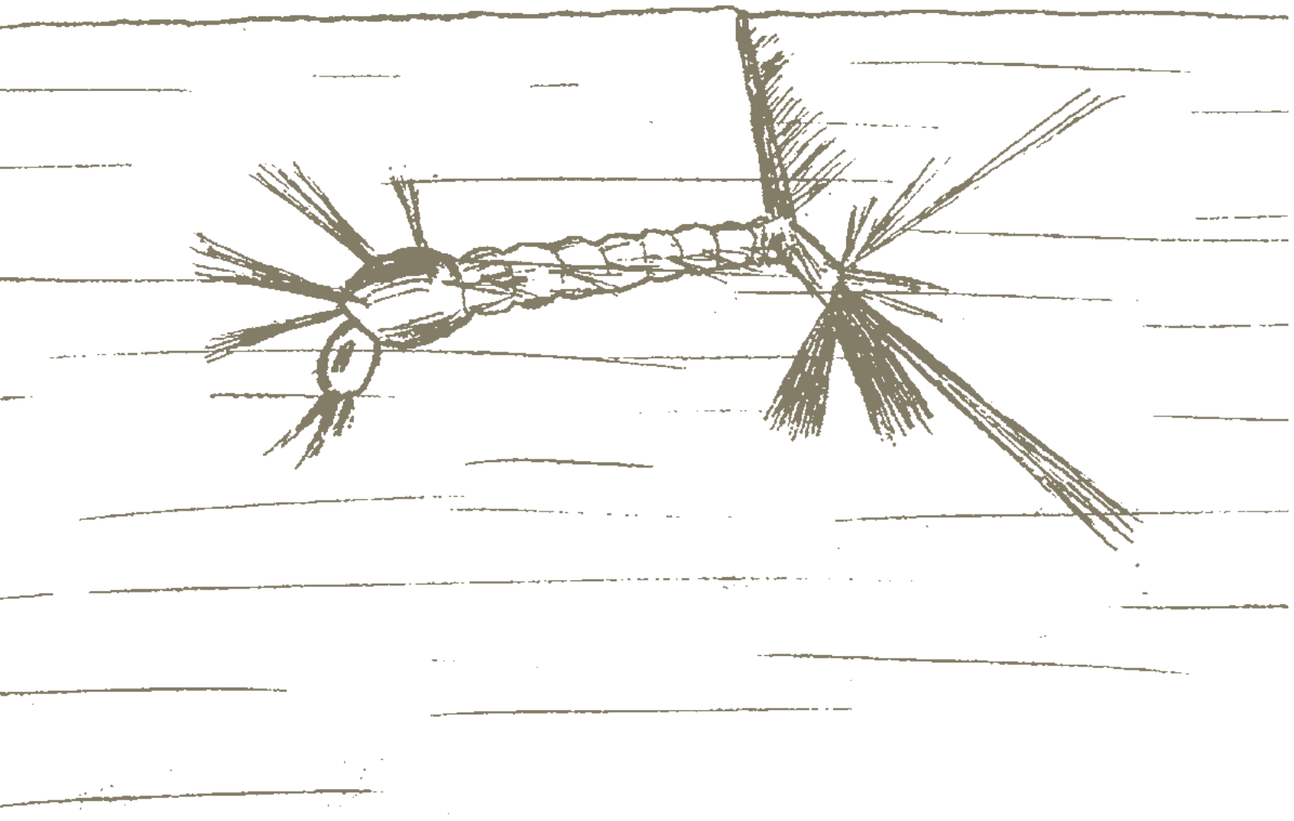
ISBN 978-65-87465-58-6.

1. Arquivos. 2. Ilustrações Científicas. 3. Entomologia. I. Lacerda, Aline Lopes (ed.).

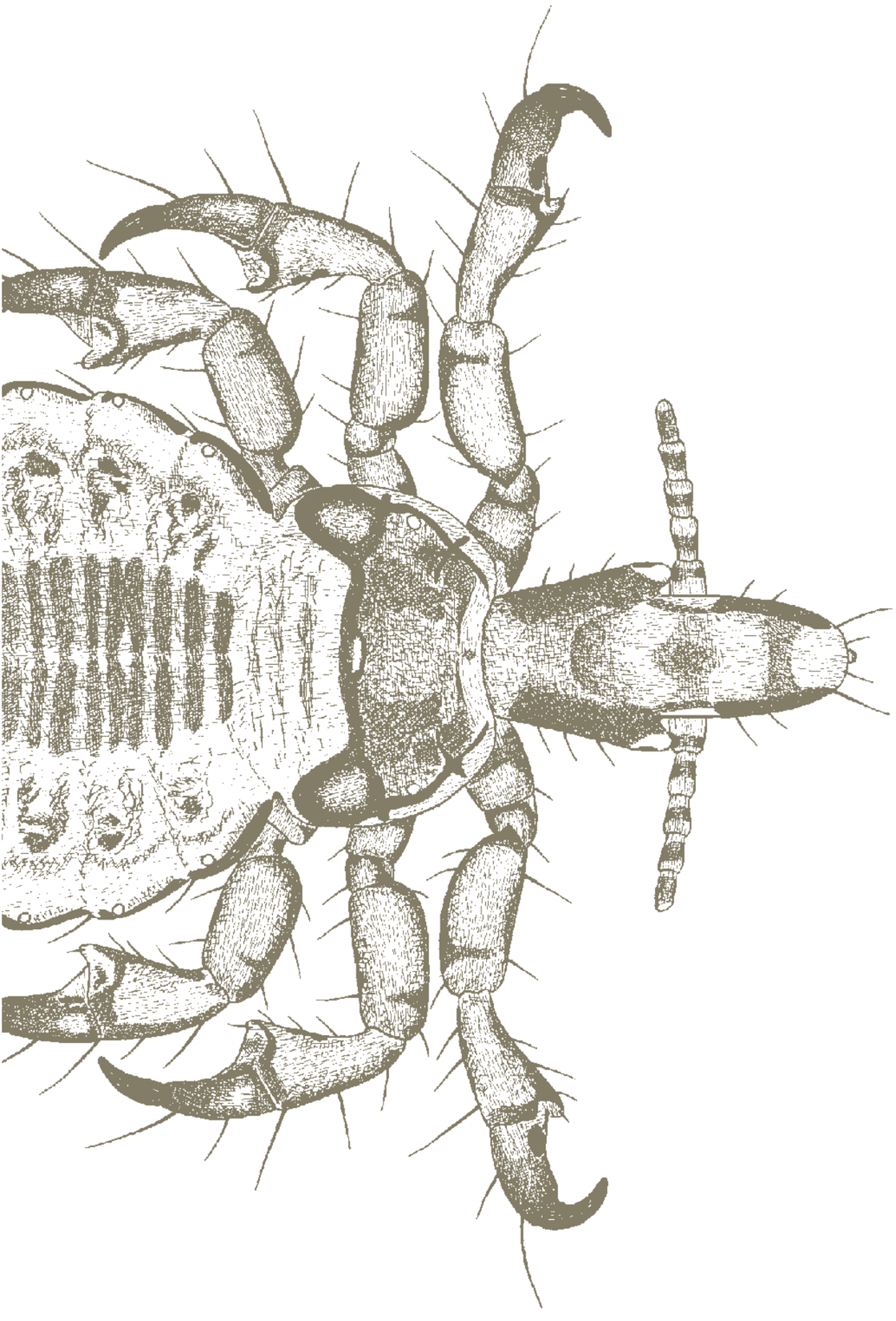
CDD 026.595

Catalogação na fonte: Marise Terra Lachini – CRB6-351

Science is a fundamentally visual endeavour.
(Geoffrey Belknap, “150 years of scientific illustration”)



CONTENTS



Foreword

PAULO ROBERTO
ELIAN DOS SANTOS
Director, Casa de Oswaldo Cruz, Fiocruz (2013-2021)

Science claimed the planet's attention on March 11, 2020, when the World Health Organization declared that COVID-19, the disease caused by a novel coronavirus, could be characterized as a pandemic. In pandemic times, it seems we discover science as it invades our lives. Indeed, science has been center stage. And yet this curious, or intriguing, "discovery" of science presents its challenges. More visible and more exposed, the field now faces a unique opportunity to enlighten society about many of its features. Science can, for example, display its most valuable characteristic: its social commitment. Similarly, science has a chance to demonstrate its rigor in the realms of data, procedures, methods, research protocols, ethical principles, and processes of communication and validation.

Science and scientists have taken on lead roles in the history of our present time, an intense, critical period for humanity. But this cast of characters also comprises supporting actors and bit players—well, I don't see these participants as such, but some do, because they fail to perceive all the elements on set.

On April 8, 2020, the Agência Fiocruz de Notícias released a note featuring an image taken by researchers at the Oswaldo Cruz Institute with an electronic microscope. The image shows a close-up of transmission, that is, of the exact moment when a cell was infected by the novel coronavirus known as Sars-CoV-2. The note also highlights another photograph taken by the researchers, this one depicting various particles of the novel coronavirus as they attempt to infect the cell's cytoplasm; here, the nucleus,

which stores the cell's genetic material, can be visualized as well. A third image portrays the viral particles inside the cell. These images, never before captured in Brazil, were part of a study on the viral replication of Sars-CoV-2 led by researchers from two Oswaldo Cruz Institute laboratories: the Viral Morphology and Morphogenesis Laboratory (Laboratório de Morfologia e Morfogênese Viral) and the Respiratory Virus and Measles Laboratory (Laboratório de Vírus Respiratórios e do Sarampo).

It seems to me that these images, or records, have moved beyond their purely figurative role. And that is a good thing. But what do we really have here? We have a record of scientific work in the arena of the so-called experimental sciences; of the laboratory as a space for the material production of science, that is, of records, lab notebooks, graphs, images, equipment, and documents used as material evidence to corroborate an experiment or serve as proof for scientific statements; and of the laboratory as a unique "social experience," to borrow the words of the philosopher Isabelle Stengers (2002). Hundreds and thousands of laboratories around the world produce records of this kind every day, records that can then be interwoven to establish explanations for our reality.

Scientific drawings and illustrations inhabit this place of experimental study where scientific knowledge and practical objects merge, and where people, manuscripts, instruments, equipment, chemical products, and experimental animals are all brought together. According to Ilana Löwy (1994), post-Kuhnian science historians studied scientific experiments and practices, along with such objects and procedures as inscriptions (laboratory notes, research projects, graphic representations, drawings, and photographs), measurement instruments, calibration and standardization techniques, and the transmission of knowledge, implicit skills, and laboratory culture. These researchers developed a definition of science—or a set of propositions regarding what they deem to constitute scientific practice—that afforded many sociologists and historians a new frame of reference. This in turn led to new ways of approaching science as an object of investigation while also spawning new questions. Within these lines of thought, laboratory studies made extremely original contributions to the sociology of science and became a mandatory reference for almost all later endeavors. Published in 1978, *Laboratory Life*, by Bruno Latour and Steve Woolgar, advanced the discussion radically (Latour & Woolgar, 1997).

The Federal Serum Therapy Institute (Instituto Soroterápico Federal) opened its doors in 1900 on Manguinhos Farm in Rio de Janeiro. The institute led Brazil's public health campaigns to combat yellow fever and the bubonic plague while laying the foundation for a center of experimental medicine. With Oswaldo Cruz at its helm as of 1902, the institute underwent rapid transformations, fostering original research and fashioning itself into a specialized bacteriology center focused on the investigation of infectious and parasitic diseases. Blending research, production, and teaching, the institute evolved into a school for experimental medicine and an active center where researchers were trained and then made their way around the country on scientific expeditions. The school was designed to encompass a series of activities and services not directly tied to knowledge production but that played a central role in legitimizing the narrative of science. The institute's photography laboratory and library, its journal *Memórias do Instituto Oswaldo Cruz*, and the presence of illustrators in its entomological research laboratories were manifestations of the complex, diverse institutional structure underpinning this drive to institutionalize science.

The book of *Images at the Service of Knowledge: Entomology in Illustrations from the Fiocruz Historical Collection* is a collective undertaking by staff at the Casa de Oswaldo Cruz Department of Archives and Documentation. Shedding light on scientific illustrations and positioning them clearly among the select set of material records produced by science, the book reveals the daily labors of these artists, who place their technical talents at the service of the scientific enterprise. It is a powerful tool, a reference work that masterfully combines historical research with the processing of archival records and gives scholars access to the constitutive elements of the Oswaldo Cruz Institute's century-long history.

Two elements inhabit the very DNA of this work, now made available to the reading public. The first is a challenge intrinsic to archival science, that is, to identify and describe audiovisual records that might easily be relegated

to the status of mere illustrations, with no ties to other records. I can vouch for the team's success in meeting this challenge. The second is the book's vocation as a model and rich resource both for specialists working with the management and preservation of scientific archives and for historians interested in a more painstaking examination of archival sources, not only to feed their research but also as an expression of historical, social, and cultural processes.

Images at the Service of Knowledge is an unequivocal manifestation of the healthy practices that should guide institutions responsible for safeguarding archives—living sources of memory, information, and knowledge.

REFERENCES

LATOUR, Bruno; WOOLGAR, Steve. *A vida de laboratório*: a produção dos fatos científicos. Tradução de Angela Ramalho Vianna. Rio de Janeiro: Relume Dumará, 1997.

LOWY, Ilana. Fleck e a historiografia recente da pesquisa biomédica. *In*: PORTOCARRERO, Vera (org.). *Filosofia, história e sociologia das ciências I*: abordagens contemporâneas. Rio de Janeiro: Editora Fiocruz, 1994. p.233-249.

STENGERS, Isabelle. *A invenção das ciências modernas*. Tradução de Max Altman. São Paulo: Editora 34, 2002.

Introduction

THE EDITORS

The quotation from Geoffrey Belknap that serves as the epigraph to this book underscores the central role that visual records played in the construction of science. The quotation was transcribed from an article published in the journal *Nature* in November 2019, in which Belknap, a researcher at the University of Leicester, England, points out that scientific activity "pivots on the material—whether that is an atom, a gene, a crystal, a whale or a distant galaxy. Its aim is elucidation. Thus, communicating research has always been predicated on combining image and text to share discoveries, ideas and observations" (Belknap, 2019).

Scientific archives certainly tell us that. They are filled with visual material sourced from studies by researchers and their assistants in laboratories and in the field. Photographs, drawings, slides—this whole gamut of visual representations recorded on a diverse range of media, formats, and processes teaches us much about the evolution of these means of capturing things and phenomena, so that they can then be painstakingly observed, analyzed, and understood in the process of constructing knowledge.

This book is a product of the study "*A imagem a serviço do conhecimento: estudo de caso sobre desenhos científicos nos arquivos históricos sob a guarda da Casa de Oswaldo Cruz*" (Images at the service of knowledge: a case study of scientific illustrations from the Casa de Oswaldo Cruz archival collection).[1] Focused on drawings produced during the course of entomological

[1] Programa de Excelência em Pesquisa da COC – PROEP. Edital: I Chamada Fiocruz/COC/CNPq. Modalidade: A. Processo: 440840/2015-5.

endeavors at the Oswaldo Cruz Institute (IOC), the project followed two main lines of inquiry in its exploration of the functions of scientific illustrations at the institute. The first was a survey and analysis of primary sources found in the archival collection held by the Casa de Oswaldo Cruz, particularly the IOC archives and the personal archives of Oswaldo Cruz, Arthur Neiva, Dyrce Lacombe, Herman Lent, José Jurberg, and Leônidas Deane and the collection of oral interviews given by researchers, curators, and technical staff who worked directly with these scientific collections.

This same line of inquiry gathered information on the artists under contract to the institute, the researchers who also did drawings, and the ties between these illustrations and the major areas of development within the IOC's entomological studies, affording a richer understanding of these records and the institutional context in which they were produced.

Approaching from the perspective of archival science, the second line of inquiry sought to problematize scientific drawing as an iconographic record of an archival nature. This entailed historical analysis both of the institutional context within which these records were produced and of the purpose they played.

Based on analysis of the data collected during these two inquiries, a description protocol was designed and applied. The protocol was then used to compile two important research products: the catalogue section of this book and a guide to sources, which situates and describes records and record sets of relevance to research on the topic that are held in the Oswaldo Cruz Foundation's archival collection.

It is worth bearing in mind just how this type of project can help advance the field's state of the art. Curated institutional archives rarely rely on protocols that adequately describe the extrinsic and intrinsic elements of the illustrations held in their custody. When images are present in research instruments, they appear primarily as part of broader record sets or, at the other extreme, in itemized form, based on bibliographic cataloguing

standards. The illustrations held in the Casa de Oswaldo Cruz archival collection are described in the former fashion, as components of series or dossiers in which records are organized and described both according to their functional or thematic links and also according to the classification scheme adopted for each archive. This methodological option, which aligns more closely with the precepts of archival science, prioritizes the context in which the images were produced and their accumulation, but leaves major gaps as far as extrinsic features. In this regard, one of the purposes of the project "Images at the service of knowledge" was to refine the illustration description protocol used in the Arch database[2] by introducing informational elements that represent these aspects better.

Other features of a contextual nature are likewise important in revealing how illustrations are done at entomological research laboratories and in helping us understand the information contained in each visual record. This type of effort can tease out previously overlooked characteristics relevant to the individual description of illustrations, while simultaneously advancing the methodological discussion regarding the description of visual records and their relationship to data within the context of their production.

This book presents the reader with research findings that unveil new aspects of these records and suggest new paths for further studies on scientific illustrations, their creators, and the institutional contexts in which they are produced and used.

Several important points are raised in the chapters authored by three key research collaborators: "The beginnings of the Oswaldo Cruz Institute's Entomological Collection," by Magali Romero Sá; "The illustrator's legacy," by José Jurberg; and "Illustrations: a stroke of art in science," by Márcio Felix. Sá's text describes the tight relationship between the IOC Entomological Collection and the collection of entomology illustrations, both of which constitute records of memories and sources from the development of this scientific area of the institution. The chapter by Jurberg offers an account of how this researcher's novel drawing technique impacted his own career. Lastly, Felix's text looks at the valuable role of scientific illustration, especially in describing new species of insects in the field of entomology.

The chapter entitled "Scientific drawings in entomology research at the Oswaldo Cruz Institute" examines this research project's various stages and facets in greater depth, while also analyzing its results. It is followed by "Timeline of Manguinhos illustrators," which provides the reader with a chronological overview of the careers of staff researchers.

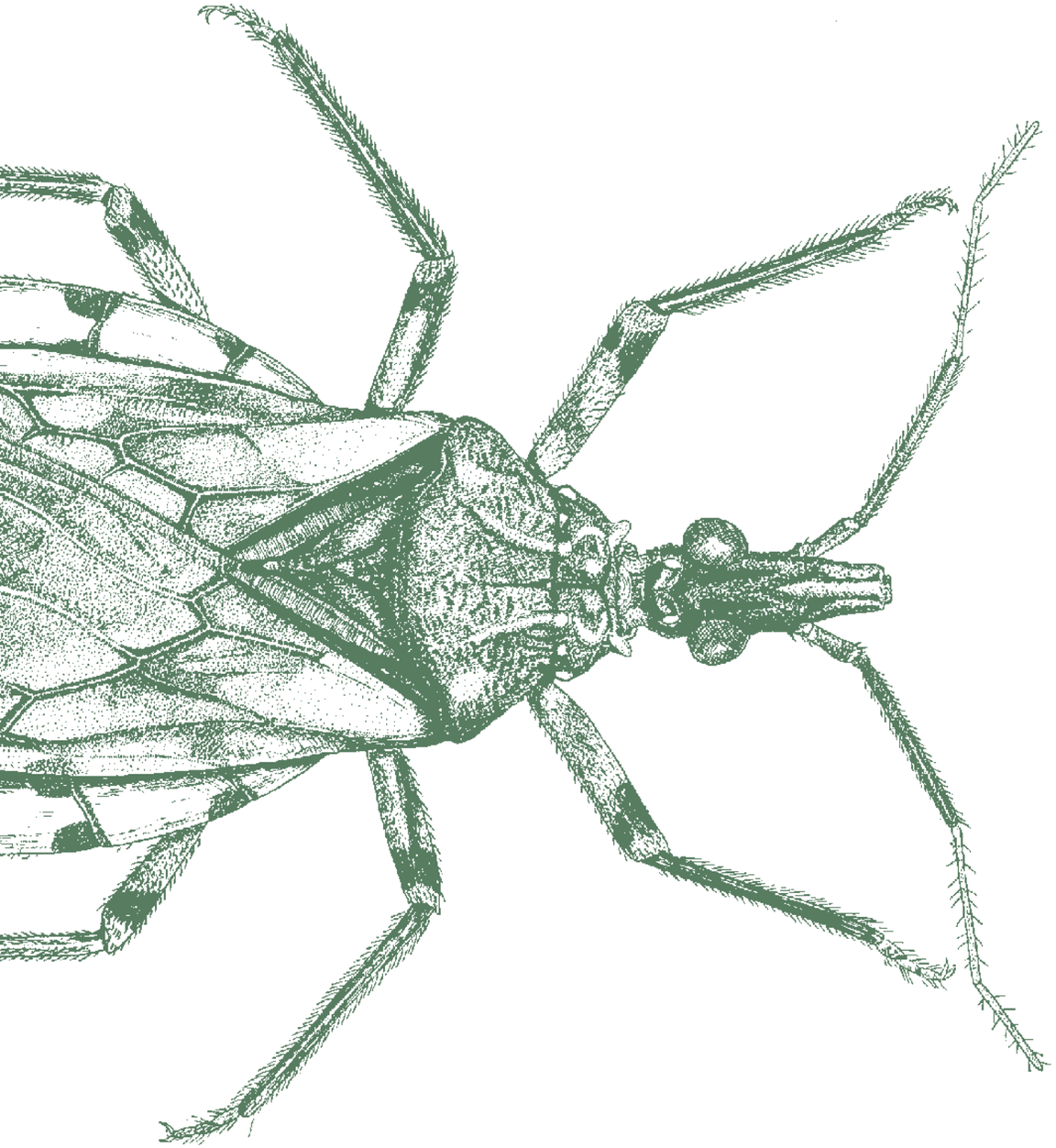
The book ends with an illustrated catalogue entitled "Catalogue of illustrators," which contains entries on IOC illustrators as well as on the researchers who did entomology illustrations at the IOC and whose original illustrations are held in Fiocruz's archival holdings. These final pages showcase the dominant features of the scientific illustrations produced at the institute from the early twentieth century through the 2010s. Image formats and patterns of representation were defined by the rules of this specialized field, many of which evince the sensitivity, artistic style, and technical mastery of their creators. While limited to entomology illustrations, this catalogue section —the heart of this book—also stands as a tribute to these artists, whose careers and valuable contributions to science have remained in the shadows. In recognition of them, the illustrated catalogue also includes entries on Manguinhos illustrators whose work does not encompass entomology drawings held in the Casa de Oswaldo Cruz archival collection.

While scientific illustration aims above all at achieving objectivity, we invite the reader to appreciate the irrepressible beauty of these images.

[2] The Arch database is a repository of information on the Fiocruz archival collection held by the Casa de Oswaldo Cruz. Adopted by the institute in 2009, it uses open-source software developed by the International Council on Archives (ICA). Pursuant to the standards of archival description, the database has a multilevel structure where each level of description can be located within the established classification model. Available at http://arch.coc.fiocruz.br.

REFERENCE

BELKNAP, Geoffrey. 150 years of scientific illustration. Essay. *Nature*, 5 nov. 2019. https://www.nature.com/articles/d41586-019-03306-9. (accessed February 21, 2021).



The beginnings of the Oswaldo Cruz Institute's Entomological Collection

MAGALI ROMERO SÁ
Researcher, Department in History of Science and Health, Casa de Oswaldo Cruz, Fiocruz

From the second half of the nineteenth century through the early twentieth, Brazilian physicians turned their attention to new discoveries then influencing the field of disease, especially Charles Darwin's theory of natural selection and the existence of pathogens. Based on the work of Louis Pasteur and Robert Koch in the field of microbiology and of Patrick Manson, Ronald Ross, and Giovanni Grassi in the field of disease vectors, Brazilian science gradually drew relations between the natural world and parasitic infectious diseases. Researchers in Brazil kept well abreast of the era's key scientific advances, not as mere passive receptors but as part of a worldwide network engaged in discovering parasites and vectors, prevention methods, and cures for diseases old and new.

Researchers like Adolpho Lutz, Oswaldo Cruz, Francisco Fajardo, Carlos Chagas, Henrique Aragão, Arthur Neiva, José Gomes de Faria, and Manoel Augusto Pirajá da Silva were pioneers in a fledgling area of research: tropical medicine. Research in this field explored the life cycle of parasites, like the worms and protozoans found in the environment or inside vertebrate and invertebrate hosts; it also investigated the mechanisms of disease transmission, especially by arthropods, like insects and arachnids. These studies required a basic understanding of natural history, including concepts of taxonomy and notions of morphology, ethology, biogeography, and ecology.

Adolpho Lutz (right) aboard the vessel *España* on the Paraná River during a scientific expedition to southern South America
1918

A new way of seeing nature was emerging, and practitioners of medicine made nomenclature rules, classification keys, and research on zoological and botanical groups part of their scientific universe. Those interested in understanding the nature of disease delved into taxonomy as well. New disciplines took form and became part of medical school courses, while a number of countries established institutes devoted to "tropical medicine."

There was a newfound appreciation for scientific collections of potential vectors and parasites. Neglected by natural history museums until the late nineteenth century, collections of Diptera drew special attention after Ronald Ross demonstrated the life cycle of the avian malaria parasite in *Culex* mosquitoes in 1898 and Giovanni Grassi, Amico Bignami, and Giuseppe Bastianelli demonstrated the life cycle of the human malaria parasite in *Anopheles* mosquitoes the following year. In fact, a big problem then facing doctors was the dearth of knowledge about this group of animals. Only 42 species of the Culicidae family, established by Johann C. Fabricius in *Entomologia systematica* in 1794, had been described during the nineteenth century, but more than two hundred new species of Diptera were described in the first decade of the twentieth century, thanks to the efforts of researchers from various countries (Lane, 1953).

The development of entomological research walked hand in hand with the development of the Oswaldo Cruz Institute (IOC). Taxonomic studies of insects became one of the main topics of research soon after the institution opened its doors in 1900, originally as the Federal Serum Therapy Institute, installed on the former Manguinhos Farm. The first specimen in the institute's Entomological Collection was an *Anopheles* (*Anopheles lutzii*), described by Oswaldo Cruz (1872-1917) in 1901 and named in honor of Adolpho Lutz (1855-1940), then director of the São Paulo Biological Institute and a forerunner in medical entomology in Brazil (Benchimol & Sá, 2006a). Lutz, who Cruz considered a great scientist and teacher, had displayed a keen interest in Diptera even before European scientists had discovered the transmitter of malaria, and he had compiled an impressive collection of insects from this group. Lutz gained fame among scientists in Brazil and abroad as an expert in Diptera and lent a hand with the monograph on Culicidae organized by Frederick Theobald (1868-1930), an entomologist contracted by the British Museum to do a study of the world's mosquitoes. Theobald thought Lutz's proposal was the best general classification of Culicidae and, in 1904, the British scientist used his research on Culicidae, including his proposed taxonomy for this insect family (cf. Benchimol & Sá, 2005).

Two years after Oswaldo Cruz's pioneer work on *Anopheles* came out, in 1901, Lutz published an overview of bloodsucking insects. In 1905, he began releasing a series of articles on Brazilian mosquitoes in *Imprensa Médica*, a São Paulo journal. By then, Lutz had amassed a collection of some two hundred species of hematophagous Diptera, gathered mainly in the states of Rio de Janeiro and São Paulo. It was around this same

time that Lutz started investigating Tabanidae as well. In 1908, he left the Bacteriological Institute to accept Cruz's invitation to join the IOC, where he continued his research on Diptera and other insect groups.

At Manguinhos, Lutz encountered a group of young doctors hired by Cruz who were examining malaria and its vectors. Arthur Neiva (1880-1943), a native of Bahia, had finished medical school at the Rio de Janeiro Faculty of Medicine in 1905, where he defended a thesis on the use of the local anesthetic amylocaine (Stovaine). While a student, he had participated in the campaign against yellow fever led by Cruz. Recommended by his professor, Antonio Pacheco Leão, he joined Manguinhos in 1906 and was soon studying malaria vectors. Carlos Chagas (1878-1934) had chosen malaria as one of his top research interests while at college; he had worked with his professor, Francisco Fajardo, at his laboratory at Santa Casa de Misericórdia Hospital, where he learned about hematology and the malaria parasite. Chagas went to Manguinhos to write his thesis on the topic, defended in 1903. After a brief stint at Jurujuba Hospital—an isolation facility for sufferers of the bubonic plague, located in the nearby city of Niterói—Chagas resumed his exploration of malaria. In 1905, he was invited to coordinate the fight against a malaria epidemic that broke out during construction of a hydroelectric dam in Itatinga, São Paulo. This successful campaign was one of countless sanitary commissions on malaria that counted not just on Chagas but also on Neiva and Cruz. During these campaigns, much attention was paid to collecting; horses were used as bait and researchers had a unique opportunity to gather many groups of Diptera and this increased the institution's collection. Cruz, Chagas, and Neiva—especially the latter two—were thoroughly engaged in the search for possible vectors of the malaria plasmodium, and they contributed to science's understanding of the biology and taxonomy of vector mosquitoes.

In 1907, as the institute underwent re-organization and was renamed the Manguinhos Institute of Experimental Pathology (Instituto de Patologia Experimental de Manguinhos; it would later be called the Oswaldo Cruz Institute), these brilliant staff scientists kept pace with the changes underway at the institution by specializing in parasitology and medical entomology, fields that were accorded a place in the organization's very bylaws. That same year, while Chagas was leading a malaria prevention campaign at the request of the Estrada de Ferro Central do Brasil railway, in Lassance, Minas Gerais, he discovered two new protozoans, along with an insect vector (the kissing bug), a finding that led to the discovery of a new human trypanosomiasis. Chagas's work spurred a drive to collect a new group of insects: Hemiptera. Neiva turned to their study and eventually became an expert on the group. In researching protozoans, Chagas worked with visiting researchers brought over from Germany by Cruz, who wanted the institute to advance this field and hoped to bolster the protozoology collection started by Henrique Aragão.

When Lutz joined Manguinhos in 1908, he added his own valuable entomological collection of Culicidae and Tabanidae to the substantial assortment of insects already there. The promotional leaflet distributed by the institute in 1909 lists its collections of insects, arachnids, helminths, bacteria, and fungus cultures. Included were 95 species of mosquitoes, 165 of Tabanidae, 40 of Ixodidae, and 61 of helminths.

The journal *Memórias do Instituto Oswaldo Cruz* played a vital role in disseminating the work done at Manguinhos. The first issue, released in 1909, featured three articles on insect taxonomy, all based on material from the institute's collection. In one of these, Neiva discussed *Anopheles* mosquitoes and their relation to malaria; the other two papers, co-authored by Lutz and Neiva, addressed the taxonomy of Tabanidae. The second issue presented an article on Simulidae by Lutz. The following year, in 1910, *Memórias* published Neiva's research on the biology of a Hemiptera, the insect that later proved to be the vector of American trypanosomiasis, now known as Chagas disease (Sá, 2008). Another important enterprise was the institutionalization of technical divisions in the areas of scientific illustration, photography, and cartography. These services were essential to the taxonomic tasks involving the institute's insect collections, and their technicians worked in close collaboration with the scientists.

Scientific illustration was gaining new importance because taxonomic identification made it necessary to have faithful representations of the specimens held in scientific collections. Just as fresh discoveries prompted

discussions of scientific foundations and led to their re-organization, art was also impacted by science. Natural history objects had to be represented precisely, without any artistic interpretation or stylistic tendencies. Ideally, drawings should present an even balance between scientific precision and artistic expression. While artists embraced the challenge of illustrating the natural world, they also acquired a deep understanding of the objects they portrayed and achieved levels of specialization and knowledge normally unique to scholars. Some came to know their objects so well that they were considered veritable experts on certain groups. The merger of science with art perhaps found its highest expression in the work of botanical illustrators. In the field of zoology, the most popular objects among natural history artists were insects, birds, and seashells.

Lutz took tremendous advantage of the specialized services offered by illustrators. His entomological studies were all accompanied by beautiful drawings, especially his work on Tabanidae, skillfully illustrated by Manoel de Castro Silva (?-1934). The scientist continued his research on Tabanidae, releasing more than twenty pioneering papers on insect families, along with studies on general techniques and observations about hematophagous Diptera. Alone or in collaboration with Neiva and Costa Lima, he published taxonomic and biological articles on *Phlebotomus*, Ceratopogonidae, Megarhininae, Hippoboscidae, Oestridae, and Tephritidae. These noteworthy collections are now part of the institute's holdings (cf. Benchimol & Sá, 2006b).

While visiting Washington D.C. in 1909, Cruz was introduced to the work on Culicidae by the scientists Leland Howard, Frederick Knab, and Harrison Dyar. Upon returning from his trip, Cruz decided to send Neiva to the United States so his colleague could familiarize himself with collections and research there. During his visit, in 1910, Neiva established close ties to this eminent group of entomologists. He in fact contributed a chapter on malaria to the book they were to publish: *The mosquitoes of North and Central America and the West Indies* (Neiva, 1912).

Another researcher who made major contributions to the IOC entomological collection was Angelo Moreira da Costa Lima (1887-1964). Costa Lima was working at the Yellow Fever Prevention Service when Cruz invited him to help fight this disease in the state of Pará. At Cruz's request, Costa Lima remained in the region after the close of the successful campaign, engaging in the battle to destroy yellow fever breeding grounds in Santarem and Óbidos. During this period, he also conducted an in-depth survey of the region's Diptera. His observations were published in *Memórias do Instituto Oswaldo Cruz* in 1914.

When he returned to Rio de Janeiro in 1913, Costa Lima began an internship at Lutz's laboratory at Manguinhos, but he left the IOC to teach agricultural entomology at the Higher School of Agriculture and Veterinary Medicine (hereinafter School of Agriculture), a job to which he devoted himself wholeheartedly. With the aid of his students and professional collectors, as well as through donations, he accumulated collections for the school. Costa Lima released myriad articles in the new journals then being founded to feature information on agricultural topics. Within a few years, he had become Brazil's leading authority on insects of agricultural concern and was frequently asked to consult on related matters when problems arose. When he accepted Chagas's invitation to return to the IOC in 1927, he kept his job at the School of Agriculture. Back at Manguinhos, he resumed his research on insects pertinent to the fields of medicine and veterinary science. His first official report bears witness to the large amount of work done under his supervision at Manguinhos's Entomology Section. This included the re-organization of the entomological collection and incorporation of new species, participation in public consultations on systematics and general and applied entomology, and the creation of an insectarium. Research topics included *Anopheles* larvae, Coleoptera ectoparasites of murids, and Hymenoptera parasites of *Triatoma*. That same year, Costa Lima published four papers on Culicidae and other articles on economic entomology. From 1928 to 1929, he was heavily involved with the yellow fever outbreak that assailed Rio de Janeiro. In collaboration with Henrique Aragão, he did various experiments on *Stegomyia* and its transmission of yellow fever (Benchimol, 2001).

Within a few years, Costa Lima's entomological laboratory at Manguinhos had become a model for taxonomic studies. Thanks to this facility and to the laboratory of Lauro Travassos, part-time helminthologist and

entomologist, Manguinhos became a mecca for young entomologists and specialists from all over Latin America. The institute's collections of insect specimens were greatly expanded through the work of Costa Lima's students and researchers in the field, as well as through donation and exchange.

Many specimens were also obtained at the initiative of Carlos Alberto Seabra, amateur entomologist and collector, who was a childhood friend of Costa Lima. Seabra, who was from a longstanding family of Portuguese descent, regularly provided Costa Lima with large quantities of specimens obtained by professional collectors or purchased from private collections. In 1952, with the help of Brazil's National Council for Scientific and Technological Development (CNPq), Seabra purchased a collection from Joseph Francisco Zikán, who had immigrated to Brazil from Czechoslovakia, and then donated it to the IOC. The collection contained around 150,000 Lepidoptera, Coleoptera, Hymenoptera, and other specimens, gathered mainly in Itatiaia, Brazil's first national park (cf. Sá, 2008). As a result of these initiatives, the entomological collection at Manguinhos was soon a reference for research in nearly all entomological groups.

In the mid-1930s, Costa Lima embarked on a lifelong project to catalogue Brazilian insects. His twelve-volume *Insetos do Brasil* (Insects of Brazil), which covers 27 insect orders, was released between 1938 and 1962. Although this publication was funded by the University of Brazil's National School of Agronomy (formerly the Higher School of Agriculture and Veterinary Medicine)[1], Costa Lima conducted his studies at Manguinhos, which afforded him infrastructure and support for his taxonomic work and for his writing. There he enjoyed access to a vast and rapidly growing institutional collection of insects, as well as an outstanding library whose holdings included nearly all the classic works on neotropical entomology; he could also avail himself of illustration and photography services. In 1937, Brazil passed a law prohibiting government employees from holding more than one public post, so Costa Lima left the IOC, in 1938. His colleagues at Manguinhos nevertheless continued to support his endeavors. While he had opted to retain his teaching job at the School of Agriculture, the IOC let him keep his laboratory space, where he continued conducting research extra-officially; the institute also gave him the support needed to see his publishing project through to fruition. He maintained his space at Manguinhos until his death in 1964 (Rangel, 2006).

Another scientist who enjoyed the same degree of autonomy in assembling an entomological collection of broad scientific interest was the helminthologist Lauro Travassos (1890-1970), who joined the IOC team in 1913 and introduced the taxonomic study of helminths to Manguinhos and Brazil. Like Costa Lima, Travassos also worked at the Yellow Fever Prevention Service. He had an interest in entomology as well, particularly butterflies, and he amassed a sizeable collection of Lepidoptera, which was stored in his laboratory. In 1937, he began publishing research on the

Lauro Travassos and Herman Lent capturing insects during a scientific excursion by the IOC to the region of the Estrada de Ferro Noroeste do Brasil railroad, state of Mato Grosso
1938

[1] The Higher School of Agriculture and Veterinary Medicine opened in 1910. In 1934, it was divided into two schools: the National School of Agronomy and the National School of Veterinary Medicine. In 1937, both schools became part of the University of Brazil; when the Rural University was established in 1943, the two schools were absorbed into it (Escola Superior de Agricultura e Medicina Veterinária, n.d.).

taxonomy of butterflies, based chiefly on material from his own collection. His work with Lepidoptera was so valuable that it was incorporated into his helminthology laboratory.

Engaging and charismatic, Travassos proved a talented lecturer at the IOC Specialization Course. In the early 1930s, he also served as professor of parasitology at the School of Agriculture, drawing many students from there to Manguinhos. As an enthusiast of entomology, he always threw his support behind researchers interested in investigating the subject and opened his laboratory to amateur and professional entomologists alike. Travassos joined Costa Lima and César Pinto in encouraging students to go into veterinary entomology. The institute thus received new specialists in this field, yielding further collections.

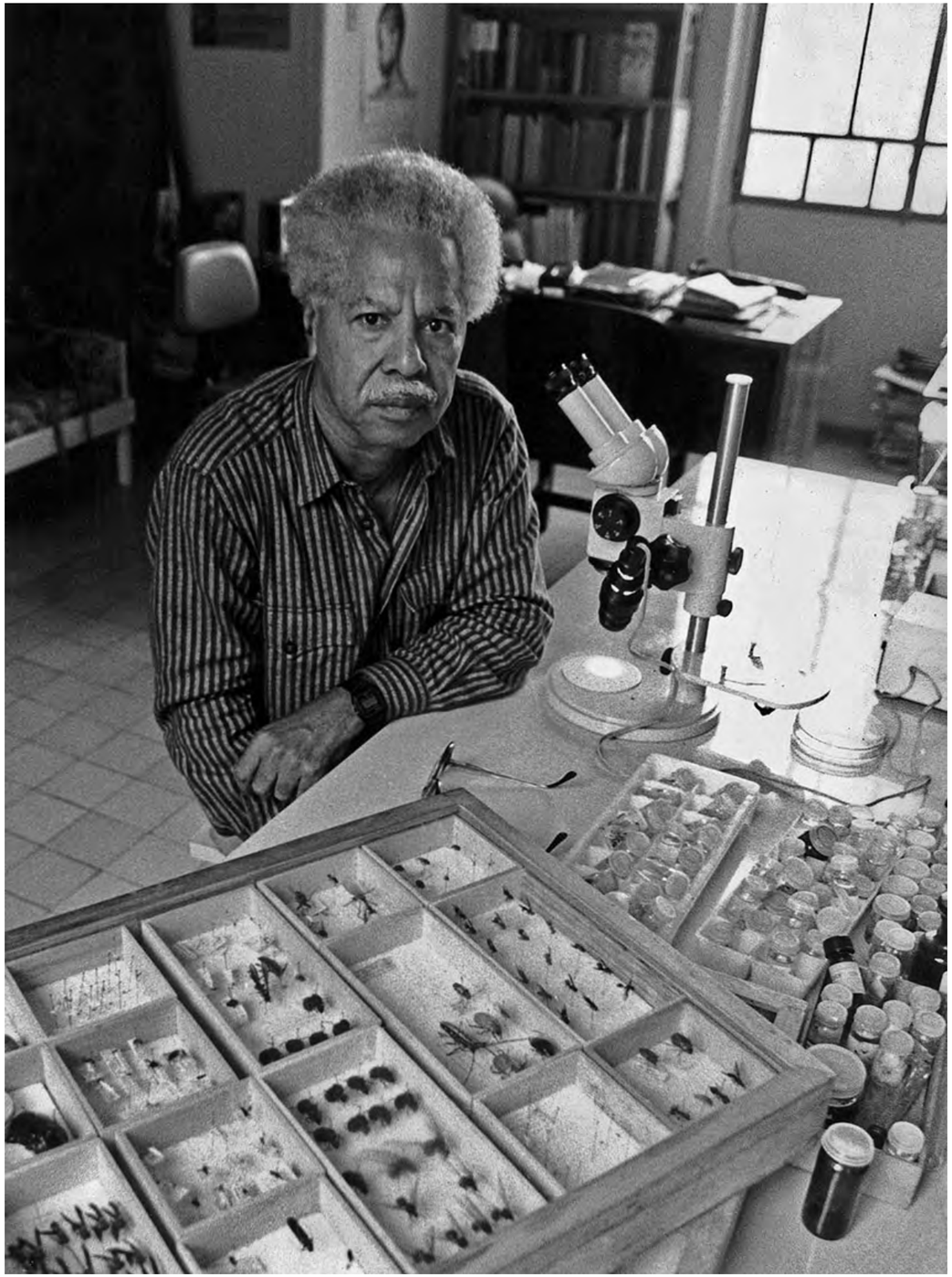
One of these collections was gathered by Fábio Leoni Werneck (1894-1961), who had trained as a physician and pharmacist and began working at Costa Lima's laboratory as an unpaid assistant in 1930. He took the IOC Specialization Course in 1931-1932 and was appointed laboratory head in 1933; he then devoted himself to lice of the orders Mallophaga and Anoplura. Werneck compiled one of Brazil's most valuable collections of lice, which encompassed 4,069 slides; 2,823 were of Mallophaga specimens, including 817 type specimens (Cardozo-de-Almeida, Linardi & Costa, 2003).

Costa Lima and Travassos pulled together a network of students who circulated between the IOC and the other institutions where they worked. The most legendary was the veterinarian Hugo de Souza Lopes (1909-1991), Travassos's student at the School of Veterinary Medicine. Souza Lopes began working as a volunteer at Travassos's IOC laboratory, where he collected specimens of the superfamily Muscoidea. He published his first papers on the group in 1932. After Souza Lopes finished his studies in 1933, Costa Lima invited him to work with Diptera at the Institute of Plant Biology in Rio de Janeiro; Souza Lopes served simultaneously as Travassos's lecture assistant at the School of Veterinary Medicine. He returned to Manguinhos in 1938 and continued working with flies at Travassos's laboratory, this time as an unpaid researcher. Souza Lopes was only appointed to the permanent IOC staff in 1949. He assembled a substantial collection of Diptera, kept at Travassos's laboratory, and became a world-recognized pioneer in Sarcophagidae (Oliveira, 1989).

Herman Lent (1911-2004), a young medical student, took the IOC Specialization Course and then joined Travassos's laboratory in 1932 as a volunteer. Inspired by Travassos's lectures, he decided to investigate helminths and released his first paper on nematodes in 1934 (Freitas & Lent, 1934). However, when the charismatic Neiva returned to Manguinhos in 1936 following a leave of absence, he persuaded Lent to switch to Hemiptera. Lent became a permanent IOC staff member in 1936 and gradually moved from helminthology to entomology. His earliest papers on Hemiptera were published in co-authorship with Neiva in 1936 and 1939 (Jurberg & Santos, 2004). Lent carried on Neiva's work after his death in 1943; he added greatly to the Hemiptera collection and made it a world reference.

Sebastião José de Oliveira (1918-2005), another veterinary student, began frequenting Travassos's laboratory in 1939. Under the supervision of Souza Lopes, Oliveira studied flies of the families Clusiidae and Anthomyiidae. He first explored the Chironomidae family in 1944 and became a specialist in this group of Diptera. Oliveira officially joined the team at Manguinhos in 1950 (Oliveira & Messias, 2005).

During the 1950s, the entomological collections at Travassos's laboratory—butterflies, mosquitoes, and flies, along with fewer specimens from other groups—were absorbed into the institute's general entomological collection. New collections of other groups that were of parasitological and vectoral interest to human or veterinarian medicine were gradually added, such as helminths, arachnids (mainly tics and mites), funguses, and protozoans. The use of preservation techniques, discussions of taxonomy, and the description of new species became a routine part of these researchers' work, and they published their results in academic and science communication journals. Special instructions for gathering and preparing specimens were drawn up for institute scientists to rely on during scientific expeditions. Researchers were also sent abroad to study collections at foreign research institutes and museums of natural history.



Sebastião José de Oliveira, curator of the Entomological Collection from 1986 to 2005, at his laboratory in the Moorish Pavilion
1988

The IOC entomological collection, initially comprised of specimens of medical or veterinary interest, eventually came to encompass a wide variety of specimens from different taxonomic groups, many gathered at places that have since suffered degradation. The Oswaldo Cruz Institute's Entomological Collection (CEIOC) now boasts some four million specimens, representing almost all insect orders. It constitutes a crucial source of information not only on Brazil's fauna diversity but also on the geographic distribution of human and animal parasites, vectors, and diseases.

Today, the collection can be deemed priceless, because on September 2, 2018, a fire struck the National Museum in Rio de Janeiro, destroying almost the entire entomological collection. The specimens held at Manguinhos, and the biological and ecological information they contain, are now the sole representatives of an era when researchers from both institutions traveled into the interior to gather their samples and engage in intense intellectual exchange.

REFERENCES

BENCHIMOL, Jayme Larry (coord.). *Febre amarela*: a doença e a vacina, uma história inacabada. Rio de Janeiro: Editora Fiocruz: Bio-Manguinhos, 2001.

BENCHIMOL, Jayme Larry; SÁ, Magali Romero. Insetos, humanos e doenças: Adolpho Lutz e a medicina tropical. *In*: BENCHIMOL, Jayme Larry; SÁ, Magali Romero (org.). *Adolpho Lutz, obra completa*. Febre amarela, malária e protozoologia. Rio de Janeiro: Editora Fiocruz, 2005. v.2, livro 1.

BENCHIMOL, Jayme Larry; SÁ, Magali Romero (org.). *Adolpho Lutz, obra completa*. Adolpho Lutz e a entomologia médica no Brasil (apresentação histórica). Rio de Janeiro: Editora Fiocruz, 2006a. v.2, livro 3.

BENCHIMOL, Jayme Larry; SÁ, Magali Romero (org.). *Adolpho Lutz, obra completa*. Entomologia. Rio de Janeiro: Editora Fiocruz, 2006b. v.2, livro 4.

CARDOZO-DE-ALMEIDA, Margareth; LINARDI, Pedro Marcos; COSTA, Jane. The type specimens of chewing lice (Insecta, Mallophaga) deposited in the Entomological Collection of Instituto Oswaldo Cruz, Rio de Janeiro, RJ, Brazil. *Memórias do Instituto Oswaldo Cruz*, Rio de Janeiro, v.98, n.2, p.233-240, 2003.

ESCOLA Superior de Agricultura e Medicina Veterinária. *In*: DICIONÁRIO histórico-biográfico das ciências da saúde no Brasil, n.d. http://www.dichistoriasaude.coc.fiocruz.br/iah/pt/verbetes/escsagmevetrj.htm (accessed September 10, 2021).

FREITAS, J.F. Teixeira de; LENT, Herman. Novo nematodeo da sub-família Heligmosominae Travassos, 1914, parasito de *Agouti paca* (L.): Avellaria avellari n. g., n. sp. *Memórias do Instituto Oswaldo Cruz*, Rio de Janeiro, v.28, n.4, p.577-583, 1934.

JURBERG, José; SANTOS, Cláudia Portes. Herman Lent: história e bibliografia. *Entomología y Vectores*, Rio de Janeiro, v.11, n.1, p.19-58, 2004.

LANE, John. *Neotropical Culicidae*. São Paulo: Universidade de São Paulo, 1953. 2v.

NEIVA, Arthur. The malarial organisms. *In*: HOWARD, Leland O.; DYAR, Harrison G.; KNAB, Frederick. *The mosquitoes of North and Central America and the West Indies*. A general consideration of mosquitoes, their habits, and their relations to the human species. Washington, D.C.: Carnegie Institution of Washington, 1912. v.1.

OLIVEIRA, Sebastião José de. A vida profissional de Hugo de Souza Lopes. *Memórias do Instituto Oswaldo Cruz*, Rio de Janeiro, v.84, supl.IV, p.III-IV, 1989.

OLIVEIRA, Sebastião José de; MESSIAS, Maria Conceição. Coleção Entomológica do Instituto Oswaldo Cruz. *In*: SIMPÓSIO NACIONAL DE COLEÇÕES CIENTÍFICAS, 1., 2005, Rio de Janeiro. *Anais* [...]. Rio de Janeiro: Instituto Oswaldo Cruz, 2005. p.53-55.

RANGEL, Marcio Ferreira. *Um entomólogo chamado Costa Lima*: a consolidação de um saber e a construção de um patrimônio científico. 2006. 300f. Tese (Doutorado em História das Ciências e da Saúde) – Casa de Oswaldo Cruz, Fundação Oswaldo Cruz, Rio de Janeiro, 2006.

SÁ, Magali Romero. Scientific collections, tropical medicine and the development of entomology in Brazil: the contribution of Instituto Oswaldo Cruz. *Parassitologia*, Roma, v.50, n.3/4, p.187-197, 2008.

The illustrator's legacy

A picture is worth a thousand words.
(Confucius, 551-479 BCE)

JOSÉ JURBERG

Head of the National and International Reference Laboratory in the Taxonomy of Triatominae and Curator of the *Triatominae* Collection, Oswaldo Cruz Institute, Fiocruz

Over the course of our existence, we *Homo sapiens* have recorded expressions of our feelings and scenes from our daily lives inside of caves and out in the open by using colored pigments made from plant resins and ashes or from other materials to sculpt or draw images. Modernity only became aware of this important art about 150 years ago, when it discovered cave paintings in Lascaux, France, and Altamira, Spain. We now know that prehistoric cave art can be found on both the old and new continents and that the oldest dates to the Paleolithic (40,000 BCE). And, to evoke the words of Confucius above, we also know that this art tells us much about our ancestors.

Researchers at the Oswaldo Cruz Institute have relied on staff artists to record their discoveries ever since the institute first opened its doors—illustrators like Manoel de Castro Silva, Raymundo Honório Daniel, and Orlando Vicente Ferreira.

I joined the Oswaldo Cruz Institute in 1960, the year I graduated from pharmacy school, because I was interested in taking a general entomology course. The class never came to be, unfortunately, since I was the only student to enroll in it. In my search for an alternative, I had an interview with the head of the Entomology Section, Dr. Herman Lent, who took me on as an intern. Two of the interview questions sealed my fate: What did I

do with my free time? Did I like to take pictures? My answers finalized the interview.

For ten years, I worked and studied on the second floor of the Moorish Pavilion in a room shared by my advisor, Dr. Lent, and Dr. Hugo de Souza Lopes. The Entomology Section and its sizeable Entomological Collection then occupied a large three-story-high room in the building. A skinny, taciturn gentleman with gray hair worked in the same office: Antonio Viegas Pugas, the illustrator who drew only for Dr. Lent. His name is burned into my memory because I learned so much while watching him do his pen-and-ink drawings. He signed his name along the side of every one of these.

Right about the same time, I began making nearly daily excursions around the Manguinhos campus to collect insects with a small net so I could classify them (all the orders). Dr. Lopes taught me *diaphanization* techniques, and I learned how to use a *camera lucida* to draw the phallic structures of insects and then compare them. By combining these approaches—drawing and comparing structures—we were able to discover new species of kissing bugs, especially cryptic species; we also managed to solve particularly challenging problems. Soon we were receiving invitations to share these new approaches; students and interns who wanted to collaborate with us came from all over.

I described more than twenty new insect species from various orders and was honored to have a new species of kissing bug named after me: *Triatoma jurbergi*. I went to work and do an internship at the British Museum in London; there, I informed others about this new tool.

I've published over a thousand drawings to date. Today I do seascapes, which I give to colleagues in Brazil and abroad. I've discovered that drawing is a joy for me—and a sacrifice for my students.

Illustrator Antonio Viegas Pugas (foreground), Luiz Fernando Ferreira, Herman Lent, Ademar Guilherme, Delir Corrêa Gomes, Paulo Bührnheim, José Jurberg, Sebastião José de Oliveira, and Cristina Mascarenhas at the IOC Entomology Section. Moorish Pavilion 1960s

Illustrations: a stroke of art in science

MÁRCIO FELIX
Entomologist and researcher, Oswaldo Cruz Institute, Fiocruz

Scientific illustration is a technique for portraying information about a research object or aspects of it through an image. These images may be in the form of drawings or photographs produced using a number of techniques or in the form of maps and other figures. The fields of zoology and botany rely heavily on scientific illustration. In zoology, images often depict general aspects of an animal's body, its color patterns, specific structures that aid in identifying it, and other details related to its behavior and life cycle, generally as observed in the natural environment.

While a scientific illustration usually complements the information presented in a text, it often transcends this role, given the depth of detail and fidelity that a good drawing or photo can offer. Scientific illustrations can thus help us process information by decodifying it visually; in fact, they often do a better job than a text, since it might take thousands of words to convey the same information—and then perhaps without the needed clarity and precision. After all, putting shapes, curves, proportions, and hues into words can often be a daunting task.

Illustrations are vital in entomology, the branch of the zoological sciences that studies insects, especially when it comes to describing new species. Description of insects is routine in science because these creatures constitute a biologically diverse group that represents more than half of the life forms known by science, a diversity that finds expression in a gamut of shapes, sizes, colors, and structures. Miniscule parts—like insect genitalia—are generally quite complex and their physical arrangement and relationships often hard to understand. It can be quite challenging to comprehend these structures clearly when they are described solely in textual form.

While the techniques used to create illustrations have varied over time—often in step with the evolution of available technical resources—many remain in steady use, like pen-and-ink drawing with the aid of a *camera lucida*. This technique, in which a specimen's image is superimposed on a drawing surface, is relatively easy to learn and works well when illustrating structural shapes and proportions. An image is projected on paper and the illustrator traces over it in ink; details can then be added to the original drawing. The final result may be a simple sketch or something much more elaborate, depending on the illustrator's skill. When supplemented with pointillism or hatching, the result may be a beautiful drawing. Many researchers use computer graphics to enhance digitized images, eliminating the need to hand-finish the drawing in ink—something that requires great skill and technique, much like true art work.

The art of photography developed as photographic equipment did. We have moved from mechanical film cameras, whose images have to be developed, to high-resolution digital cameras that produce immediate results. When coupled to optical equipment and used in conjunction with software that combines several photographs from different planes, these devices can produce sharp, high-quality images of miniscule structures. But while photography may be faster and easier, a photo often fails to replace a good drawing, where an artist relies on techniques like shading to highlight shapes and structures that are not as readily apparent in a photo. Drawings allow for greater freedom of expression, without relinquishing fidelity to the represented object. Photography is of course used to capture nature on the spot, something that generally is not possible with drawing.

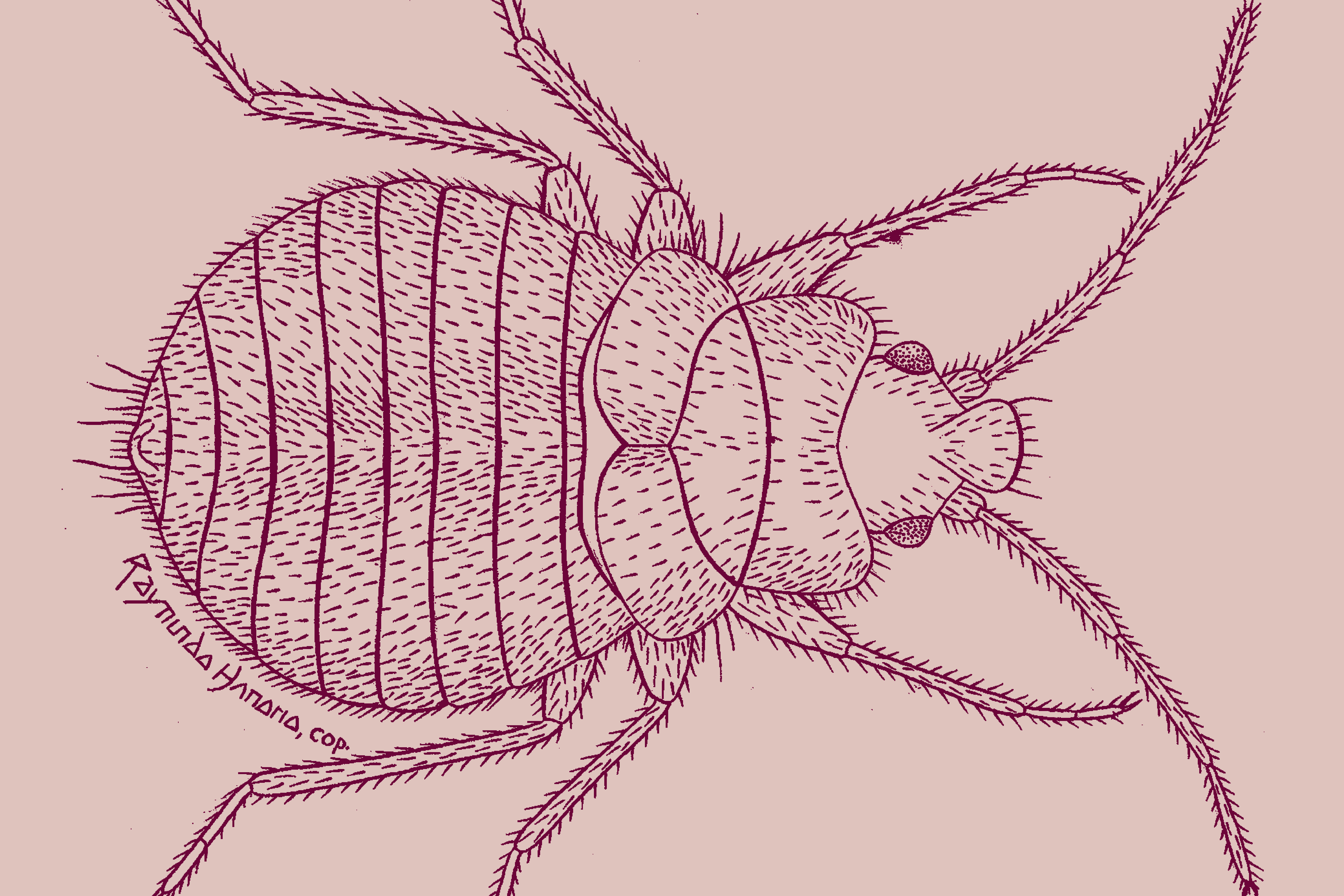
In the past, professional illustrators often worked together with researchers, producing images for publication in scientific papers. When the researcher and the illustrator had a good working relationship, the latter could

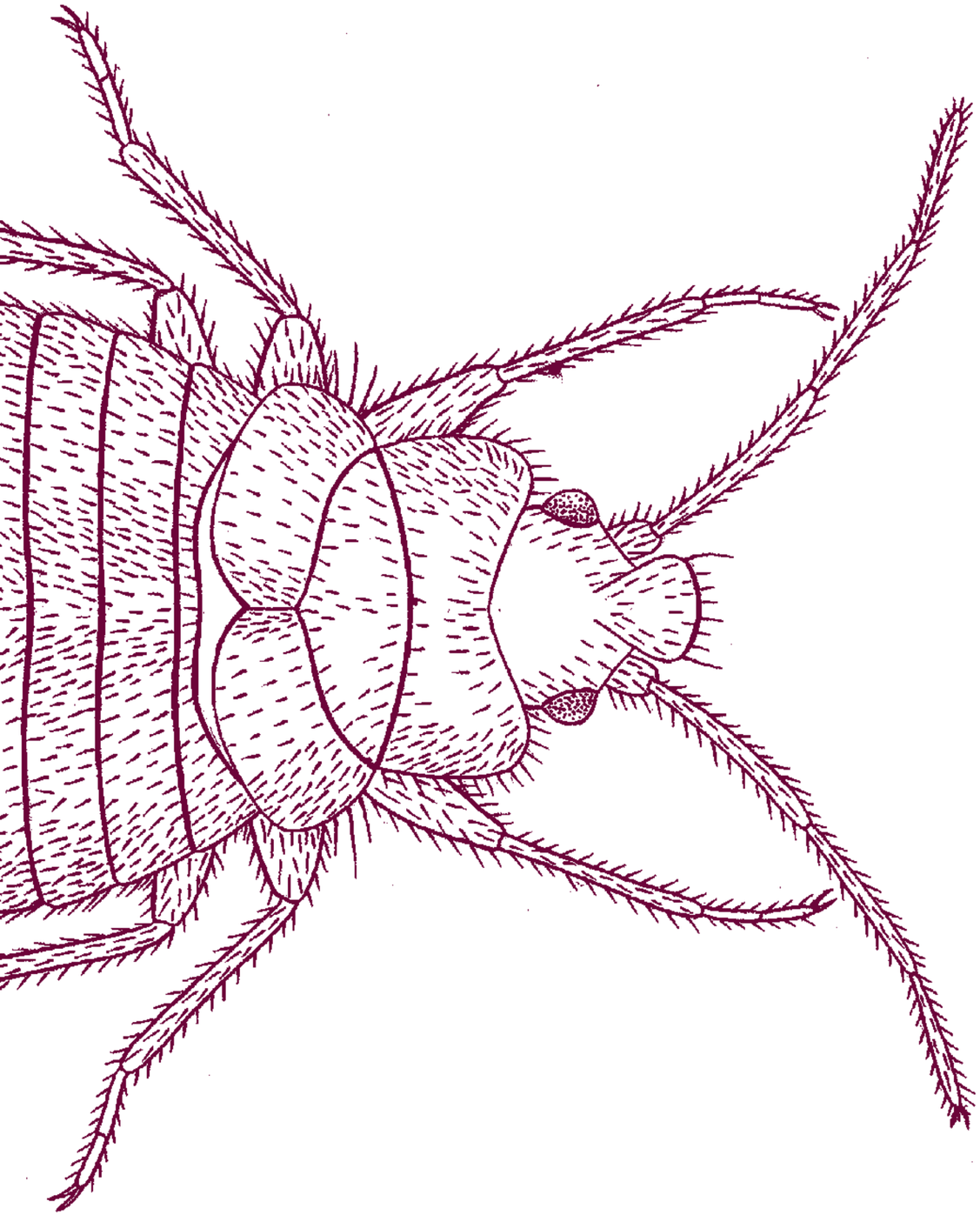
Forcipomyia obesa Lima, 1928; maxillary palpus (dotted line indicates sensory pit), also depicted in a photograph by J. Pinto, where the sensory pit is not discernible
1928
Indian ink; 14.5cm x 8.5cm
Black-and-white photograph; 9cm x 4.3cm

ensure the fidelity demanded by scientific work. Other researchers learned techniques so they could illustrate their own work; their drawings might be simpler and sketchier, but quite faithful to their subjects. Examples of both are to be found in articles published by researchers from the Oswaldo Cruz Institute, as highlighted in this work.

The value of reclaiming the history of the scientific illustration of entomological research at the Oswaldo Cruz Institute lies in the tremendous value that these drawings, photographs, maps, and figures have had in expressing aspects of knowledge produced at the institute and

released in publications. The researchers who worked as illustrators, along with the (practically anonymous) professional artists themselves, have played a major role in building this history. May we always remember the importance of scientific illustration and the role of art in science. This is one of this catalogue's biggest contributions.


Raymunda Hanaria, cop.



Scientific drawings in entomology research at the Oswaldo Cruz Institute

> Drawing, photography, and cartography are supplementary services indispensable to any organization like the Oswaldo Cruz Institute. Oswaldo Cruz and his closest successors paid greater attention to the first two.
>
> (Olympio da Fonseca Filho, *A escola de Manguinhos*)

ALINE LOPES DE LACERDA

ANA LUCE GIRÃO SOARES DE LIMA

FELIPE ALMEIDA VIEIRA

FRANCISCO DOS SANTOS LOURENÇO

REGINA CELIE SIMÕES MARQUES

Researchers and documentalists, Departamento de Arquivo e Documentação, Casa de Oswaldo Cruz, Fiocruz

An integral part of the archival collection in the custody of the Casa de Oswaldo Cruz (COC) consists of several thousand scientific illustrations in the form of drawings, resulting from entomological research activities conducted at the Oswaldo Cruz Institute (IOC) during the twentieth century and first decade of the twenty-first. While these records are organized in conformity with archival practice as far as their arrangement and ordering, research instruments such as inventories, catalogues, and the like also offer information intrinsic to the records themselves (dimensions, quantities, signatures, and other physical attributes), as well as extrinsic information, which can be attributed to them through research or through external information such as the context of production.

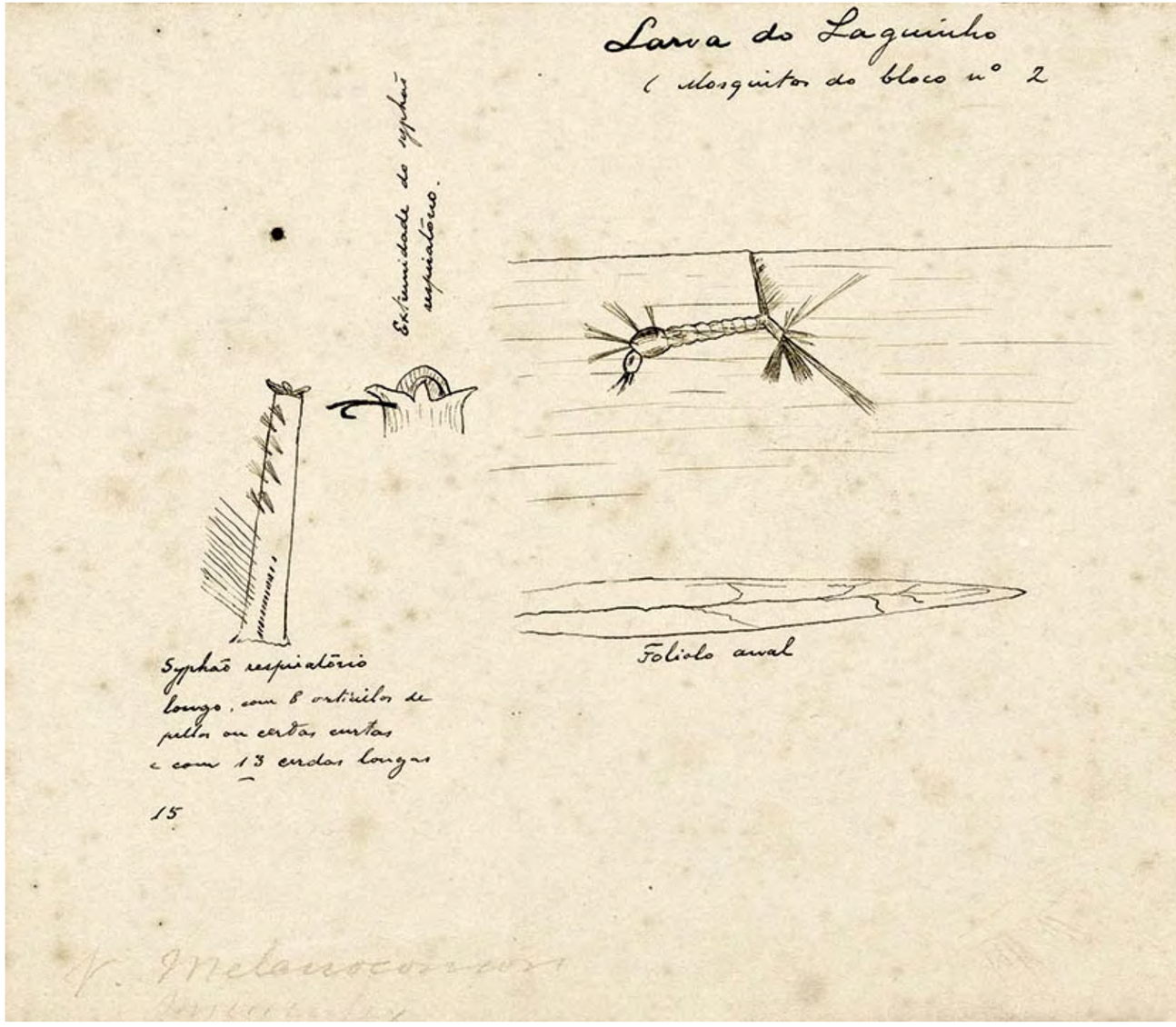
Unfortunately, the large record sets that are the most prevalent form of representation of information among the research tools generated by archival methodology often present major gaps when it comes to information both about the conditions under which the iconographic

records contained within these sets have been produced and also about their purposes. In terms of scientific drawings, for example, information is often missing that might clarify their genesis and circuits of use, the rationale that guided their production and publication, their role in a given scientific text, their relations with other discursive resources used in conducting and communicating research, and their relationship to the institute's scientific collections. This was the concern that motivated the present study, one of whose products was a specific inventory model for scientific drawings.

The study examined drawings related to the field of entomology held either in the IOC archives or as part of the personal archives of some IOC researchers. Because we were interested in information on the context in which these drawings are produced, we centered our investigation on the creation and development of an illustration service at a scientific institution, to wit, the IOC. The daily activity of producing drawings in a research environment, whether in the field or in a laboratory, apparently became naturalized during the many stages of scientific work, which rely on various sources of knowledge. From a formal perspective, while large volumes of records were produced during these activities and have withstood the course of time, it proved hard to identify other signs of the activity or the institutional paths of its agents in the archive. The illustrators were staff members or contributors (to use the present-day expression) who formed nearly invisible cogs within the institutional apparatus that produced these documental records.

Today, it is hard to pinpoint the reasons for this invisibility. One factor likely relates to the dynamics of the work process itself, that is, to the fact that all illustrations had to be approved by the researchers who requisitioned the material for their publications. If a drawing did not match the request or the researcher's goals, a new one had to be done by the same or another illustrator. It should be noted that this type of relationship between researcher and illustrator remains the case today:

> The fidelity of the representation is especially important as it is an "identification document" that must be preserved as a record of the species. It is recommended that sketches be reviewed by specialists so that no detail is overlooked and to avoid errors in the representation of the characters, which need to be verified and identified in the drawing (Lima & Pereira, 2016, p.75).



Fieldwork card with notes on details of the morphology and use of the respiratory syphon of larva of the mosquito *Melanoconion* Theobald, 1903, currently a subgenus of *Culex* Linnaeus, 1758, captured in Laguinho, a marsh located in Santarém, state of Pará. Study conducted by Angelo Moreira da Costa Lima for the Commission for Yellow Fever Prevention (Comissão de Profilaxia Defensiva da Febre Amarela)
1912
India ink; 12.5cm x 15cm

Cimex limai, now *Propicimex limai* (Pinto, 1927), bat parasite, dorsal view of female. Drawing by Luiz Kattenbach, disparaged by the researcher César Ferreira Pinto, who wrote on its back "no good." The same species, depicted by Joaquim Franco de Toledo in the book *Tratado de parasitologia* (Pinto, 1930)
India ink; 29.5cm x 20cm

Considering that drawings are important elements of scientific activity, another premise of our investigation was that the images created as part of scientific research are not appendages to knowledge production but are central to legitimizing scientific discourse and constructing their place, alongside the text, in proving the facts and discoveries that are being narrated; in this sense, they supersede their artistic or merely ornamental qualities. According to Sicard (2006, p.281), "technical systems of observation, as well as systems for producing associated images, act to structure knowledge and guide the imagination." Drawings are produced in series and are tightly linked to the scientific workflow. Any endeavor to understand the processes by which these drawings are created and disseminated within an institutional culture must entail not only an analysis of the illustrations themselves but also a survey of information that can shed light on the process, including relevant actors, work logic, changes over time, and so on. We must also ask how these drawings came into being, who created them, under what conditions, and how institutional frameworks impacted them. These interconnections, however, do not always exist in formal terms or leave footprints behind. In an institutional situation, there is an intriguing gap between the productive work executed daily and the relative invisibility of this work within the institution's archives.

The primary purposes of drawings

Drawings have always played a role as intermediaries of scientific knowledge, alongside the text. As two complementary forms of discourse, images and words work together in the construction of ways of seeing, reading, and knowing. Today, debates about the links between scientific writing and accompanying illustrations customarily address elements of an artistic, educational, and science communication nature, all concerned with analyzing the practices involved in using these images. The purpose of illustrations is a recurrent theme in these discussions (Correia, 2011; Fabris & Kern, 2006; Oliveira & Conduru, 2004). Drawings were not among the new technical images of the nineteenth century, like photographs, that had a major impact because of the largely automatic character of the new techniques—automatic and therefore detached from human subjectivity. Drawings greatly predate the use of photographs in scientific research and their role was not supplanted by the power of photographic realism. Sicard (2006, p.30), remarking on Leonardo da Vinci's paintings and drawings, calls attention to a dimension of drawing that has still found no substitute: "a scientist's figures pursue . . . invisible machinery . . . underlying structures and architectures . . . hidden workings."

We believe it pertinent to underscore the dual role of drawings: representational and explicative. In the former case, the task is to mimic nature; in the second, to scrutinize the object's "architecture." From the perspective of the activity of science, the purposes that motivate the creation of drawings also express a researcher's findings (Sicard, 2006), meaning they have much to tell us about the scientific activity that informed them. The primary purpose of these drawings—that is, their ability to hierarchize characteristics with authority, as they expand on and faithfully represent the

original—will never be surpassed. And the prime channels for their use and dissemination are publications, lectures, and classes.

Drawings and scientific collections

It is worth noting that drawings are strongly associated with the creation and maintenance of entomology collections. We can assume that dry specimens do not serve the same purpose as drawings. We can imagine the entomologist at his daily tasks, capturing insects, classifying and describing them, organizing insect collections, and recording specimens in the form of drawings. Dry specimens, "given their value as evidence, serve as proof," while drawings, on the other hand, "prove nothing. By presenting scientific certainties, drawings constitute that which should be observed in order to arrive at an exact determination" (Sicard, 2006, p.96). In this sense, there is a relationship of interdependence between, on the one hand, gathering insects from nature and making them part of a collection and, on the other, producing tools that assist the process of analysis, aimed at morphological description and the subsequent definition of species.

The work of characterizing species, which grounds the creation of entomology collections, relies heavily on the production of drawings. Textual descriptions use illustrations to help lend visual contours to what is being described. According to Sicard (2006, p.94), "language organizes the indescribable, fascinating abundance of nature's forms." In this sense, drawings seek to show insect structures and general aspects, which is relevant to their characterization: "Working with taxonomy requires drawing" (Felix, 2017). In discussing the relationship between Linnaeus and the use of illustrations in botanical classification, Sicard (2006, p.95) points out that:

> Paradoxically, Linnaean classification invites representation. Schematic drawings of flowers create hierarchies and accentuate and render visible not *that which we see* but rather *that which should be seen*. . .
> Their prime goal is not similarity; their essential vocation is not to relate sensitive appearances but to enable naming and, therefore, understanding. [emphasis in the original].

In the words of Márcio Felix (2017), a researcher and illustrator involved in contemporary entomology research, "certain structures, certain details, are

Cabinet containing insects of the order Lepidoptera; boxes of slides from the IOC Entomological Collection, Moorish Pavilion
September 29, 1953

more visible in a drawing. You can emphasize a certain part . . . in a drawing, you can show what needs to be shown."

A drawing's form and content seem to attend to this educational facet of the researcher's task, where a concern with painstaking description generates visual models that portray relevant structures of the specimen, which can serve as a reference in representing a group. Beyond the pictorial universe offered by the drawings, it is also pertinent to explore the development of the activity itself, which has afforded the production and accumulation of vast material for use in entomological studies today and in the past.

The entomology drawings in the Casa de Oswaldo Cruz collection

The collection holds 8,368 original drawings from the area of entomology at the IOC, whose production has been substantial since the institution's earliest days. These records run from 1901—date of the first article on insects published by Oswaldo Cruz, with the seal "Trabalho do Instituto de Manguinhos" (Work from the Manguinhos Institute) and featuring illustrations by the researcher himself—through 2007, the most recent year in which drawings were incorporated into the archival holdings under the responsibility of the COC.

Almost all of these records relate to morphological descriptions of structures and histological studies encompassing various phases of the biological cycle of insects, both of medical importance and not. Morphology is a fundamental tool in taxonomy, a science focused primarily on describing, identifying, and classifying species, which has played a key role in the history of the IOC. These drawings were done with the aid of such equipment as microscopes and magnifying glasses, which are indispensable in observing and representing a specimen and its structures. Time-honored freehand techniques and materials were used, such as graphite pencil, scratchboard, watercolor, pastel, and, primarily, India ink.[1]

Fábio Leoni Werneck, Octávio Mangabeira Filho, Hugo de Souza Lopes, and Marcos Kogan left behind a sizable number of drawings related to their research that attest to a widespread practice among researchers. The scholars who did not have the skill to represent their species of interest turned to contracted illustrators. One of these researchers was Herman Lent,[2] who actively supervised the drawings he ordered and at times rejected them during the course of the work (Jurberg, 2018).

[1] On the characterization of the devices and techniques used in scientific illustrations, see, among others, Pereira, 2016, and Rapatão & Peiró, 2016.

[2] Herman Lent (1911-2004) graduated from the Rio de Janeiro Faculty of Medicine in 1934. He joined the IOC in 1932, where he conducted research on helminths and insects, particularly kissing bugs, the vectors of Chagas disease. In 1970, he lost his political rights and was forced into retirement under Institutional Acts 5 and 10. He then worked in Venezuela and the United States. Upon returning to Brazil, he was hired by the Universidade Santa Úrsula and also rendered services to Fiocruz.

Anno XV — Num. 43 — 15 de Novembro de 1901

BRAZIL-MEDICO

REVISTA SEMANAL DE MEDICINA E CIRURGIA

SUMMARIO:

ENTOMOLOGIA:— *Contribuição para o estudo dos culicidios do Rio de Janeiro*, pelo Dr. Oswaldo Gonçalves Cruz.

EPIDEMIOLOGIA:— *A peste em Napoles* (Extr. do Policlinico, de Roma).

ASSOCIAÇÕES SCIENTIFICAS:— Academia Nacional de Medicina —*A proposito de um calculo vesical*, pelo Dr. Barata Ribeiro; *Um caso medico-legal*, pelos Drs. Costa Ferraz e Alfredo Nascimento; *Operação da cataracta*, pelo Dr. Pires Ferreira — Sociedade de Medicina e Cirurgia: — *Um caso de kysto dermoide*, pelo Dr. Leão do Aquino; *A proposito da peste*; pelos Drs. Francisco Campello, Daniel de Almeida, Eduardo Meirelles e Leão de Aquino.

BOLETIM DA SEMANA:— *A continuação da peste*, por I. R.

BIBLIOGRAPHIA:— *Novos preparados pharmaceuticos*, pelos Srs. F. Werner & C.; *Perigo das Moscas — A myase — Therapia da Myase*, pelo Dr. J. Bleyer; *O signal de Roussel no diagnostico precoce da tuberculose pulmonar*, pelo Dr. A. Austregesilo, por I. R.— *Medicina Psychica*, parecer do medico Cunha Cruz, por F. F.

FORMULARIO PRACTICO:— *Tratamento das fermentações gastro-intestinaes e dos arrotos nidorosos*, pelo Dr. Plascido Barbosa.

CHRONICA E NOTICIAS.

ENTOMOLOGIA

Contribuição para o estudo dos culicidios do Rio de Janeiro

PELO DR. OSWALDO GONÇALVES CRUZ

(Trabalho do *Instituto de Manguinhos*)

Estudando os culicidios de algumas dos fócos de impaludismo dos arredores do Rio de Janeiro (Jardim Botanico, Sarapuhy), encontrámos uma especie per-

Estudando os culicidios de algumas dos fócos de impaludismo dos arredores do Rio de Janeiro (Jardim Botanico, Sarapuhy), encontrámos uma especie pertencente ao genero *Anopheles*, que não nos foi possivel identificar com as especies descriptas por GILES em seu livro sobre mosquitos, publicado em 1900. Não tivemos occasião de observar os individuos do sexo masculino da especie em questão. Tentámos fazer culturas artificiaes, mas, por ora, não conseguimos mais que os ovos e as larvas, morrendo estas poucos dias após a eclosão, o que attribuimos á baixa temperatura do ambiente, no momento em que operámos (mez de Junho).

Passamos a descrever o individuo adulto do sexo feminino, assim como os ovos e as larvas, nos primeiros dias de seu desenvolvimento.

ANOPHELES sp. ? (*Jardim Botanico, Sarapuhy*)

Côr geral do mosquito: escuro quasi preto. Comprimento, não incluindo a *proboscida*: 4 a 6 millimetros.

Azas — Comprimento: 4 a 5 m/m, segundo o desenvolvimento do insecto. Côr geral da aza amarello-louro. Sobre a nervura costal notam-se 3 manchas pretas principaes, além de mais quatro secundarias, das quaes tres punctiformes. Das 3 grandes manchas uma occupa a extremidade livre da aza. A essa denominaremos mancha n. 1 (vide fig. 1).

As outras duas assestam-se sobre a nervura costal propriamente dita, extendendo-se para baixo até á primeira nervura longitudinal. Denominaremos essas manchas de ns. 2 e 3. Além dessas, temos a considerar um pequeno ponto mais pigmentado e situado sobre a 5ª nervura longitudinal (N. S. fig. 1).

7 6 5 4 3 2 1

FIG. 1

Aza direita:
(pequeno augmento)
1, 2, 3—Manchas principaes.
4, 5, 6, 7, 8—Manchas secundarias.
1—Mancha escamosa.
2—Mancha mixta.
3—Mancha mixta, com predominancia de pigmento.
1—Mancha escamosa.
2—Mancha mixta.
3—Mancha mixta, com predominancia de pigmento.

As manchas são constituidas por um accumulo de escamas pretas e de pigmento preto. As escamas e a pigmentação não concorrem com igual contingente para a formação de todas as manchas. Assim, a mancha da extremidade livre da aza (n. 1) é constituida quasi que exclusivamente por escamas, e é por isso que póde desapparecer nos exemplares muito manipulados, ao passo que a mancha n. 3 deve sua côr, sobretudo, ao pigmento, como se poderá ver pela inspecção da figura n. 2, que, como a de n. 1, devemos á pericia do nosso distincto collega e amigo Dr. ROCHA LIMA. Essa figura representa a mancha n. 3 vista sob um maior augmento. Todas as nervuras são cobertas de escamas de côr castanho-claro alouradas. A parte interna da *vena marginalis* é ornada por uma franja constituida por escamas de diversos tamanhos, que se acham em contacto pelas faces planas.

marginalis é ornada por uma franja constituida por escamas de diversos tamanhos, que se acham em contacto pelas faces planas.

FIG. 2

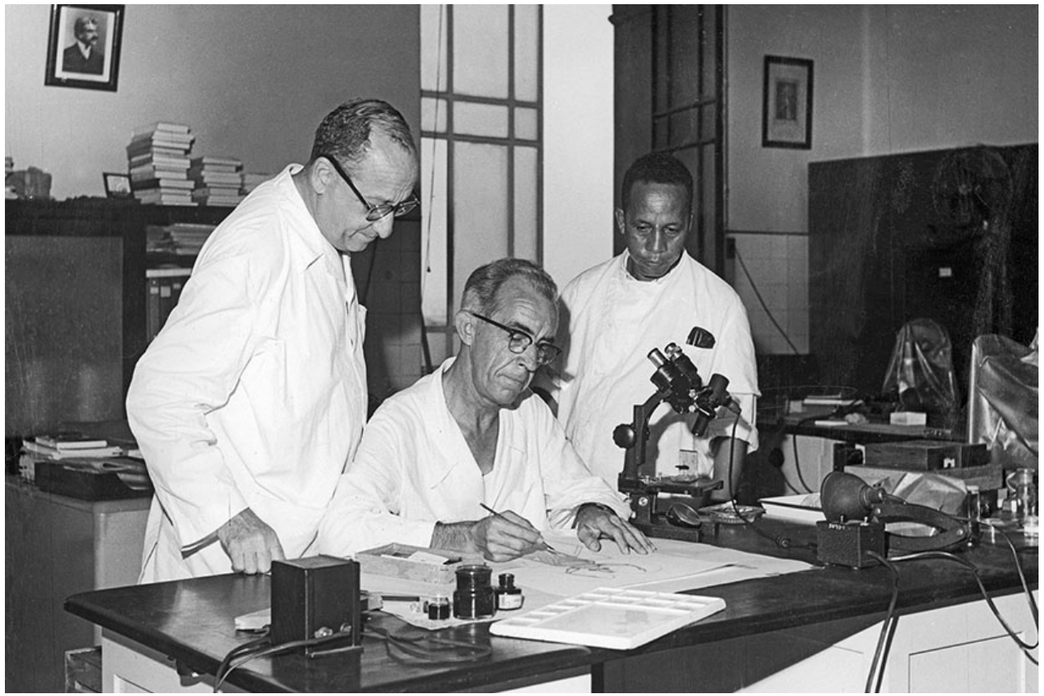
Detalhes de estructura da mancha n. 3 da aza (Vide fig. 1.)

First page of Oswaldo Cruz's article in the journal *Brazil-Medico*
1901

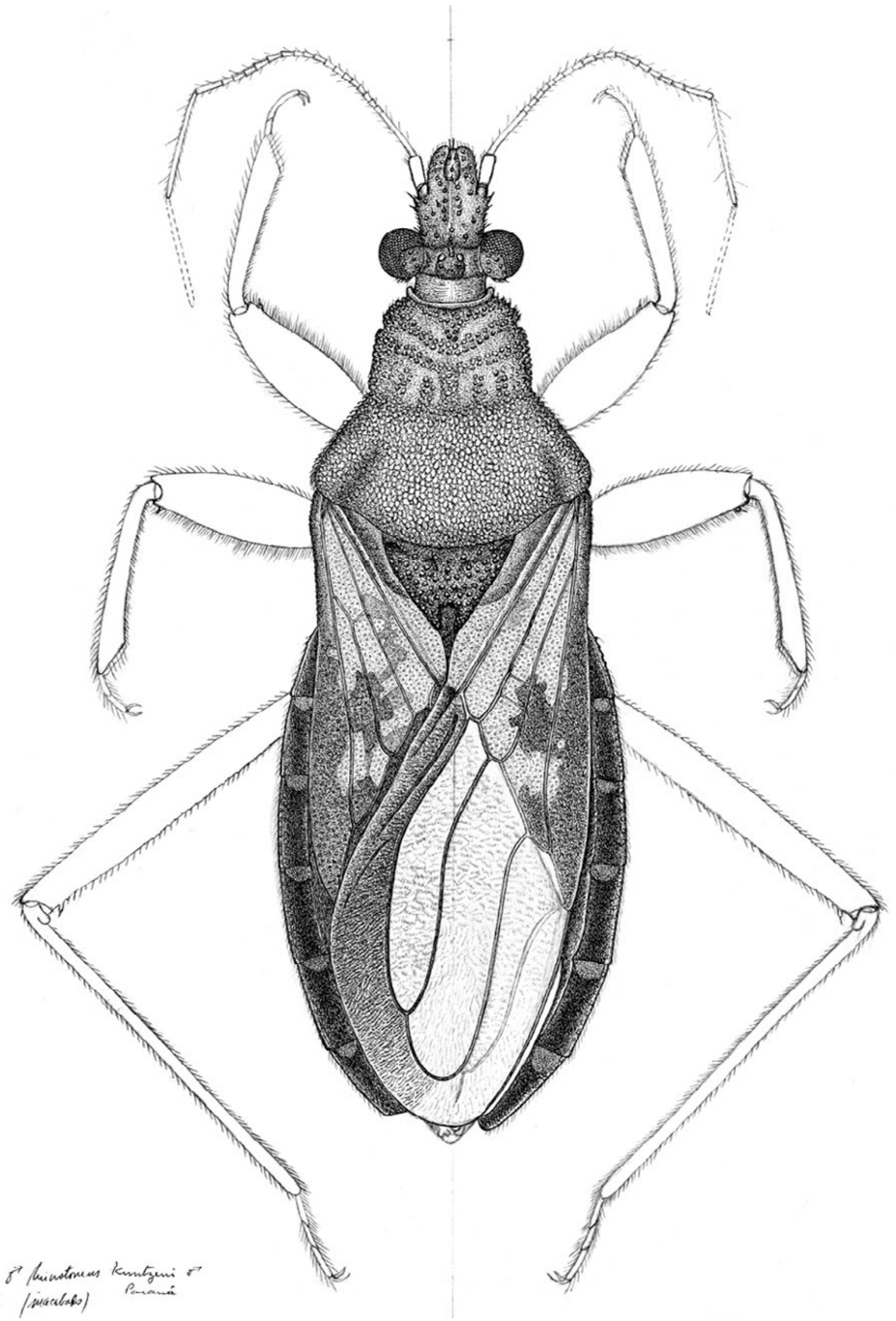
> The use of scientific drawing was indispensable to researchers. The proximity of researchers' and illustrators' rooms signals the importance that the former accorded the latter. While many of the scientific illustrators at Manguinhos remain anonymous, some of the more well-known were Castro e Silva . . . and Raimundo Honório Daniel (Castro, 2004, p.145).

These illustrators gained prominence at the IOC because their skilled artistic work helped construct the narrative proposed by researchers. The fact that these drawings were published validates them as correct representations of the depicted objects. A number of IOC researchers paid tribute to these professionals. Herman Lent, for example, honored the illustrator Antonio Viegas Pugas by naming a new insect species after him: *Triatoma pugasi* (Lent, 1953). On another occasion, Angelo Moreira da Costa Lima, Brazil's preeminent entomologist, recorded his appreciation of illustrators:

> To the belated Prof. Castro Silva, the incomparable master of scientific drawing in Brazil, who so kindly agreed to do some of the figures that illustrate the text. To the highly skilled illustrator C. Lacerda for doing some of the original drawings (Lima, 1938, p.X).



Antonio Viegas Pugas at his drawing table, observed by Herman Lent and Ademar Guilherme. IOC Entomology Section, Moorish Pavilion
1960s



Microtomus kuntzeni Stichel, 1926, male, dorsal view. Incomplete drawing of an insect of the family Reduviidae, ordered by Herman Lent and attributed to Antonio Viegas Pugas
N.d.
India ink and graphite pencil; 51cm x 36.5cm

Entomology drawings are distributed across seven archives under the responsibility of the COC: Oswaldo Cruz Institute, Arthur Neiva,[3] Dyrce Lacombe, Herman Lent, José Jurberg, Leônidas Deane, and Oswaldo Cruz.

The content of the **Oswaldo Cruz Institute** archive reflects the institution's roles and activities during the twentieth century in the areas of research, teaching, technological production, and hospital care in the fields of the biomedical sciences and public health. The archives are organized into sections that represent the institute's structure, including a section related to the Entomology Department. The latter section contains the Entomological Collection subsection, whose series Studies and Research is of special interest to us. This set comprises records from field and laboratory work conducted by researchers and students in the course of producing knowledge on Brazil's entomological fauna and their potential for transmitting such maladies as malaria, leishmaniasis, and Chagas disease. The researchers involved in forming and developing the Entomology Collection lend their names to the subseries that bring together the scientific drawings held in the IOC archives, which total 2,976 items.

The subseries Adolpho Lutz—Brazil's leading scholar of tropical medicine—holds two drawings of mosquitoes of unknown authorship, done for a paper published in a German periodical in 1929.

The subseries Angelo Moreira da Costa Lima holds seventy drawings related to observations of various species of Culicidae (mosquitoes) from Santarém, Óbidos, and other locations in Pará, dated 1910 to 1913; Brazilian insects of the genus *Forcipomyia*, which are part of the Adolpho Lutz collection, produced between 1914 and 1963; and the genus *Apiomerus*, dated 1951. These drawings are signed by the researchers Costa Lima, Carlos Alberto Campos Seabra, and Charles Ronald Hathaway and by the illustrator Carlos Leal Lacerda.

[3] Arthur Neiva (1880-1943) graduated in 1903 from the Rio de Janeiro Faculty of Medicine. Three years later, he joined the Federal Serum Therapy Institute, renamed the IOC in 1908, where he conducted major research on parasitology and entomology, particularly *Anopheles* mosquitoes and the triatomes that transmit Chagas disease. In São Paulo, he headed the Sanitary Service, the Commission to Study and Overcome the Coffee Borer, and the Biological Institute of Agricultural and Animal Defense. In Rio de Janeiro, he led the National Museum. He was a federal congressman and interventor in Bahia under the first Getúlio Vargas government.

The subseries Fábio Leoni Werneck holds a total of 2,083 drawings of lice species that infest birds and mammals. The lice specimens are part of the IOC Entomological Collection. These drawings were published in Brazilian and foreign scientific periodicals between the 1930s and 1950s and were done by Werneck himself, by the U.S. researcher Gordon Floyd Ferris, and by the illustrator Raymundo Honório Daniel.

The subseries Herman Lent holds ten drawings done for the first thesis on insects written at Manguinhos, between 1906 and 1907, by Antonio Gonçalves Peryassú[4] under the advisorship of Oswaldo Cruz and Arthur Neiva, entitled *Os culicideos do Brazil* (Culicidae of Brazil). The drawings are by Manoel de Castro Silva, the institution's first sketch artist.

The subseries Hugo de Souza Lopes contains 415 drawings related to insects from the families Sarcophagidae, Conopidae, Tachinidae, Calliphoridae, Syrphidae, and Neriidae, done between 1959 and 1967. They were done by the researcher himself, Léa Monteiro, William R. Thompson, Martín Ladislao Aczél, and Rubens Pinto de Mello.

The subseries Octávio Mangabeira Filho holds 336 drawings related to *Hymenoptera,* such as *Eupistrina lopesi*, dated 1937, and *Pristocera gigantea*, dated 1930; the species *Neivamyia lutzi* and *Neivamyia travassosi* (flies), dated 1938; and the species of Phlebotominae published in the series "Contribuição ao estudo dos *Flebotomus*" (Contribution to the study of *Phlebotomus*), done between 1941 and 1942. The drawings are signed by Mangabeira Filho, the French researcher Roger Pierre Hipolyte Arlé, and the illustrator Antonio Viegas Pugas.

The subseries Sebastião José de Oliveira[5] contains sixty drawings related to insects of the orders Strepsiptera, Hemiptera, and Coleoptera, done from 1959 to 1964 by the researcher himself and by Marcos Kogan.

[4] Antonio Gonçalves Peryassú (1879-1962) graduated from the Rio de Janeiro Faculty of Medicine in 1908, the year he defended his medical thesis *Os culicideos do Brazil*, which became a successful book the same year. He conducted research on mosquitoes, including the description of new species; took part in campaigns to combat malaria and yellow fever; and taught at the college level in a number of Brazilian states.

[5] Sebastião José de Oliveira (1918-2005) graduated in 1941 from the National Veterinary School (Escola Nacional de Veterinária). In 1939 he joined the IOC, where he conducted studies on insects of the orders Strepsiptera (Stylopidae, Myrmecolacidae, and Mengeidae) and Diptera (Anthomyidae, Culicidae, Ephydridae, Agromyzidae, and Chironomidae). In 1970, he lost his political rights and was forced into retirement under Institutional Acts 5 and 10. In 1986 he re-joined Fiocruz, where he served as curator of the IOC Entomology Collection until his death.

The **Arthur Neiva personal archive** hold twenty-six drawings that are products of the researcher's work in São Paulo as head of the Commission to Study and Overcome the Coffee Borer (Comissão de Estudo e Debelação da Praga Cafeeira), which was the springboard for the 1927 opening of the Biological Institute of Agricultural and Animal Defense (Instituto Biológico de Defesa Agrícola e Animal). These drawings depict various aspects of *Stephanoderes coffeae*, now *Hypothenemus hampei* (Ferrari, 1867), and were done to illustrate informational material for the fight against the coffee borer. They were the work of Alberto Federman, Carlos Rudolf Fischer, and Joaquim Franco de Toledo.

The **Dyrce Lacombe personal archive** contain forty-one drawings related to the scientific communication of his research on *Embolyntha batesi*, from 1965, and on species of the subfamily Triatominae (kissing bugs), from 1971. The drawings are signed by the researcher herself.

The **Herman Lent personal archive** hold 1,245 drawings dated 1941 to 1993, related primarily to research planning and the communication of findings. These drawings involve morphology and taxonomy research on insects of the family Reduviidae, which notably includes the vectors of Chagas disease (kissing bugs). The archives also hold drawings related to research on Cimicidae (bedbugs), done by César Ferreira Pinto[6] and by Lent himself. Other drawings reflected the researcher's teaching activities and participation on editorial boards. The drawings were done by the researchers Petr Wolfgang Wygodzinsky,[7] Roger Pierre Hipolyte Arlé, and Kathleen Schmidt and by the illustrators Antonio Viegas Pugas, Manoel de Castro Silva, Luiz Kattenbach, Raymundo Honório Daniel, and Joaquim Franco de Toledo.

The **José Jurberg personal archive** hold 3,629 drawings, dated 1945 to 2007. Like the Herman Lent archives, most of the drawings are related to his activities in research planning and the communication of findings; scientific and cultural exchange; academic advisorships; and teaching, for a total of 3,557 items. Sixty-six of the drawings relate to the researcher's participation on editorial boards, while another six have to do with technical and scientific cooperation. The drawings were done by José Jurberg himself and by researchers in his laboratory.

The **Leônidas Deane personal archive** bring together 445 drawings related to studies on *Anopheles* mosquitoes from the Amazon and Northeast, conducted by the researcher and his wife, Maria José von Paumgartten Deane. Both researchers signed the drawings, dated 1940 to 1980.

The **Oswaldo Cruz personal archive** hold seven drawings of the species *Anopheles lutzii*. The researcher did them as part of his studies on malaria, which led to the publication of the article "Contribuição para o estudo dos culicidios do Rio de Janeiro" (Contribution to the study of Culicidae of Rio de Janeiro; Cruz, 1901).

Drawing as an activity within the IOC organizational structure

The institutionalization of science in Brazil was a process that began in the early nineteenth century and was consolidated in the twentieth, with the emergence of major centers for scientific production in various fields (Dantes, 1980; Schwartzman, 2001). During the process, a number of professions proved fundamental to the development of this research, especially in composing the discourse to be registered, translated into figures, communicated, taught, and, lastly, archived. At the institutional spaces devoted to scientific work, these activities were assigned to the drawing, photography, and cartography sectors, where skilled professionals exercised the role of "translators" of distinct languages (Lacerda et al., 2016).

The same phenomenon took place at the IOC, which had been established at a time when the scientific field itself was undergoing transformation and a growing body of research was being grounded in the postulates of experimental medicine. In the context of developing this work, scientific illustration played an integral part of the IOC's organizational structure.

[6] César Ferreira Pinto (1896-1964) graduated from the Rio de Janeiro Faculty of Medicine in 1919. The following year he joined the IOC, where he conducted research on insects of medical and veterinarian interest, including helminths, gregarines, leeches, and parasitic diseases.

[7] The researcher Petr Wolfgang Wygodzinsky was also known as Peter, Pedro, and, to family and friends, Wygo.

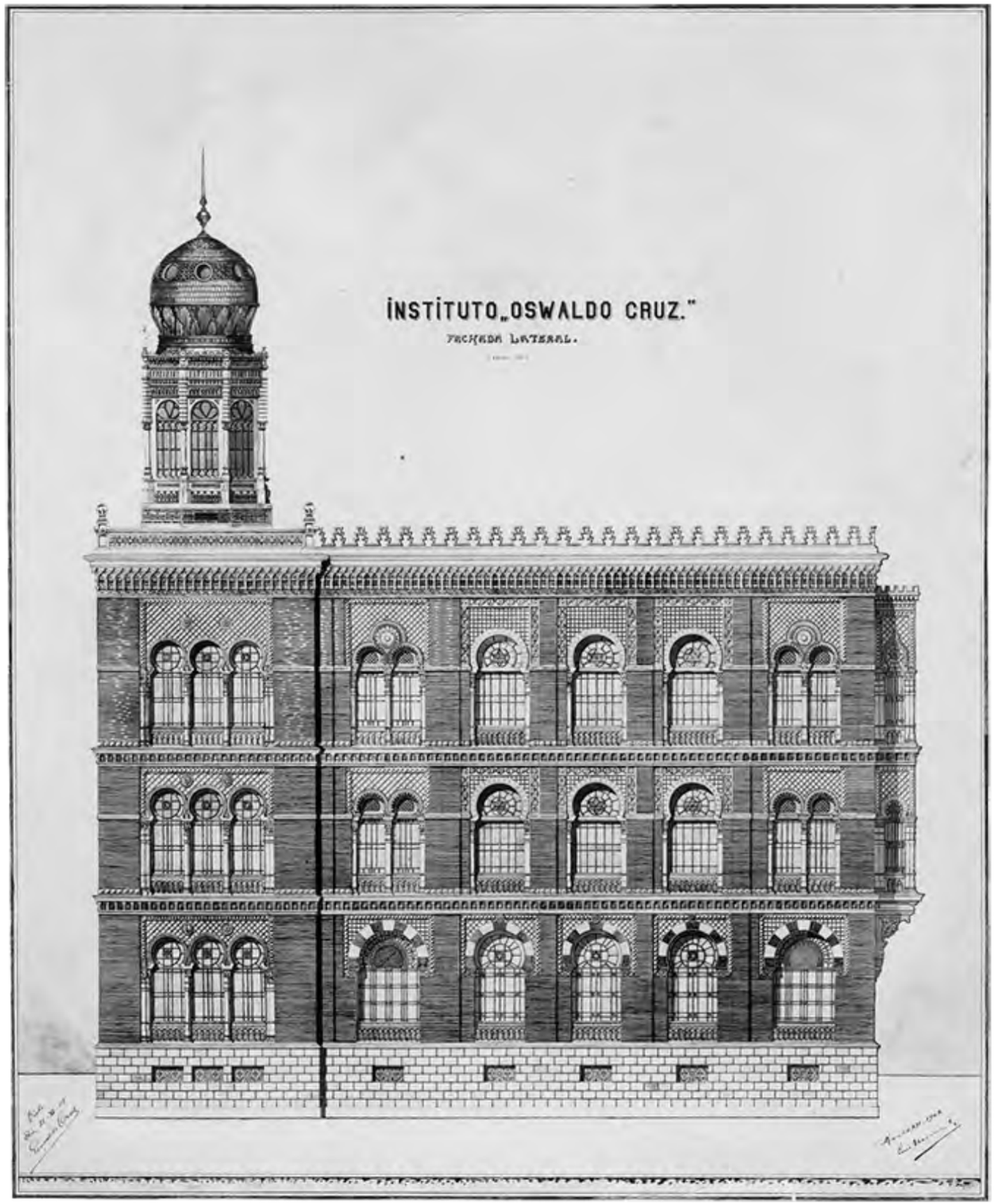
Moorish Pavilion under construction and, on the left, a detail of the tower of the Plague Pavilion
1907

The Manguinhos Institute of Experimental Pathology (Instituto de Patologia Experimental de Manguinhos) was officially established in 1907 (Brasil, 1907). The institution had originally opened its doors in 1900 as the Federal Serum Therapy Institute (Instituto Soroterápico Federal), under the leadership of Baron of Pedro Affonso,[8] but it was then reshaped by Oswaldo Cruz, who took over in 1902 and added experimental medical research and teaching to its attributes, in addition to the production of sera and vaccines (Benchimol & Teixeira, 1993; Instituto Soroterápico Federal, n.d.). The same official act of 1907 detached the institution from the General Directorate of Public Health (Diretoria Geral de Saúde Pública), attaching it directly to the Ministry of Justice and Internal Affairs.

The goal was to lend the institution greater autonomy vis-à-vis the government and officialize what had been happening in practice. Since 1901, students and new graduates of the Rio de Janeiro Faculty of Medicine (Faculdade de Medicina do Rio de Janeiro) had turned to the Federal Serum Therapy Institute in search of original topics for their medical theses, forming the foundation of what would eventually become the IOC Specialization Courses (Cursos de Aplicação). Young researchers were also drawn to laboratories at Manguinhos, where the fields of microbiology and tropical medicine were working hand in hand to fight Brazil's most prevalent diseases (Aragão, 1950; Araújo-Jorge, Barbosa & Lourenço-de-Oliveira, 2012). Oswaldo Cruz's push for autonomy also benefitted when the institute began making a new drug: a vaccine against blackleg, a disease that attacks beef cattle. Sales of this vaccine formed an important source of funds for the IOC over the next twenty years, underpinning the institute's notable expansion during this period (Benchimol, 1990).

The government decree officially establishing the Manguinhos Institute of Experimental Pathology determined that staff would include not only technical-scientific personnel (six assistants and two heads of service), but

[8] Pedro Affonso de Carvalho Franco (1845-1920) graduated from the Rio de Janeiro Faculty of Medicine in 1869 and from the University of Paris in 1871. Pedro II bestowed on him the title of Baron of Pedro Affonso in 1889. He founded the Municipal Vaccine Institute (Instituto Vacínico Municipal) in 1894 as part of the effort to establish a smallpox vaccination service in Rio de Janeiro, then the federal capital. He headed the Federal Serum Therapy Institute from 1900, when it opened its doors, until 1902, when the post was given to Oswaldo Cruz, with whom he had had disagreements of both a technical and administrative nature. The Vaccine Institute was closed in 1920, when production of the smallpox vaccine was assigned to the IOC.



Sketch of the lateral façade of the Moorish Pavilion by the Portuguese architect Luiz de Moraes Júnior
December 20, 1908

others as well. The post of sketch artist appeared alongside that of caretaker, stockman, and clerk-archivist, suggesting that drawing was considered an auxiliary service.

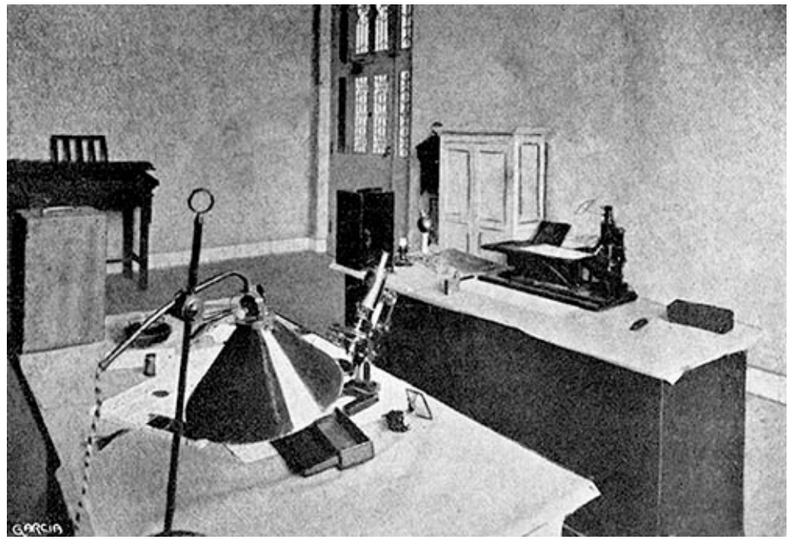
Some months later, in March 1908, the institute approved its first set of regulations, by decree (Brasil, 1908). The document renamed it the Oswaldo Cruz Institute, in deference to the man then at its helm, who had gained renown both in Brazil and abroad. The new regulations maintained the same staffing positions as the previous. The job description for sketch artist stipulated that this professional should "perform the work of drawing, painting, and doing calligraphy as assigned him by the director" (art. 39), suggesting that in formal terms this staff member was directly subordinated to the institute's highest authority. The post of sketch artist was the only one excluded from the ranked list of acceptable substitutes in case a staff member could not perform his duties: an sketch artist could only be substituted by another sketch artist.

The IOC was only to approve new regulations in 1926, when Carlos Chagas[9] was its head. The document portrays the institution's organizational structure, which comprised sections defined according to their scientific, administrative, or auxiliary nature (Brasil, 1926). Among the auxiliary sections were Drawing, Library, Photography, and Microphotography,[10] reflecting the array of professions then required to meet the institute's needs. The IOC was defined under the decree as "an institute of experimental pathology enjoying absolute autonomy in technical and scientific investigations, as well as a teaching and specialization institute" (chap. I, art. 1).

Under the new regulations, the job description for sketch artist a post within the Drawing Section, remained unchanged: the sketch artist was to

[9] Carlos Ribeiro Justiniano Chagas (1878-1934) graduated in 1903 from the Rio de Janeiro Faculty of Medicine. In 1908, he joined the IOC, where he had a noteworthy career as a researcher, head of service, and director (1917-1934). In 1909 he announced the discovery of American trypanosomiasis, or Chagas disease. He was head of the General Directorate of Public Health, the National Department of Public Health, and Rio de Janeiro's International Leprology Center; professor at the University of Rio de Janeiro; and member of the League of Nations' Health Committee and of various scientific associations and societies.

[10] The following auxiliary sections were also included in the regulation published in 1926: Serum and Vaccine Distribution; Sterilization and Culture Medium Preparation; Typography; Mechanics and Electricity; Vivarium and Stables; Carpentry; Museum; Building and Road Conservation; Bookbinding Shop; and Vial and Glassworks Shop.



Drawing room at the Oswaldo Cruz Institute, located in the Moorish Pavilion
1910s

perform the work of drawing, painting, and calligraphy. The other job title in this section was sketch artist aide (*ajudante de desenhista*). The sketch artist was still directly subordinated to the IOC director, as suggested by two of his duties: "to distribute to the sketch artist aides and other aides, designated by the director, the jobs which he cannot personally perform; . . . fulfill the director's verbal or written determinations" (Brasil, 1926, chap. V, art. 60).

IOC posts were to be filled in one of four ways: by appointment of the President of the Republic; by appointment of the minister; by proposal from the director and appointment of the minister (including the posts of sketch artist and sketch artist aide); and by appointment of the director.

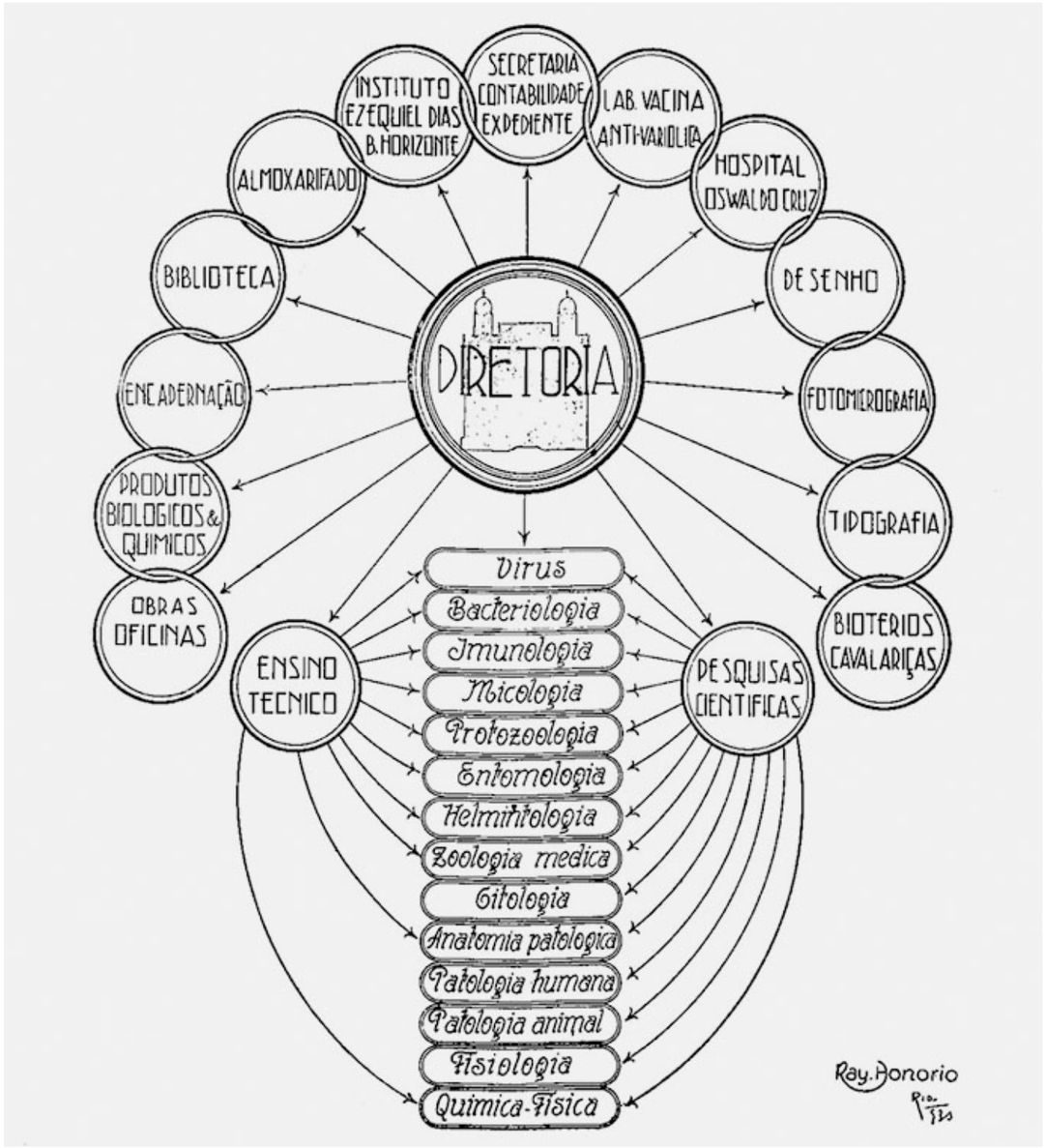
Even a quick glance at the rules concerning IOC posts under the First Republic provides insight on such matters as the degree of administrative autonomy enjoyed by the various bodies of the federal government, on which posts were considered strategic by the top echelons of public administration, and on the status of the various personnel posts. Under the first three IOC regulations (1907, 1908, and 1926), the post of sketch artist enjoyed an intermediary status: while this employee's assignments were essentially technical in nature, the appointment was made by the top-most echelon of the public administration.

When the first Getúlio Vargas government came to power, in 1930, the IOC was made to respond directly to the new Secretary of State, under the decree that established the Ministry of Education and Public Health (Brasil, Nov. 1930, art. 5). In December of that same year, the decree that defined the new ministry's structure established the National Department of Experimental Medicine (Departamento Nacional de Medicina Experimental), to which the IOC was then attached (Brasil, Dec. 1930, art. 3).

The regulations of the National Department of Experimental Medicine were published in May 1931 (Brasil, 1931), bringing together the IOC, its branches, and any counterpart institutes the government might choose to create. In organizational terms, the IOC continued to be structured in sections, and few changes were made to the previously approved regulations. The Drawing Section remained an auxiliary section and its duties went unchanged. Section posts included head sketch artist and sketch artist; the former retained the duties ascribed under the 1926 decree and would receive assignments directly from the IOC director.

In October 1932, the services of the National Department of Experimental Medicine were transferred to the IOC, which was then subordinated directly to the Secretary of State (Brasil, 1932). Another meaningful change came in 1937, when funding for the IOC, then headed by Antonio Cardoso Fontes[11] and subordinated to the National Health Department (Departamento Nacional de Saúde), was placed completely under government control. Moreover, the institute was forced to stop producing blackleg vaccine and limited to making products only for human health. In the words of Benchimol (1990, p.75), "the measures taken by Minister Capanema during the Estado Novo put an end to the institutional model designed by Oswaldo Cruz."

[11] Antonio Cardoso Fontes (1879-1943) graduated from the Rio de Janeiro Faculty of Medicine in 1902. Two years earlier, while still a student, he began his career with the Federal Serum Therapy Institute (renamed the IOC in 1908), where he served as a researcher, professor, and director (1934-1942). He was an inspector for the Yellow Fever Prophylaxis Service and professor at the Faculty of Medical Sciences of Rio de Janeiro. He was well known for his research on tuberculosis and the granular form of *Mycobacterium tuberculosis*, or Koch's bacillus.



Oswaldo Cruz Institute flow chart by illustrator Raymundo Honório Daniel
1935

New IOC bylaws were approved by the director Henrique de Beaurepaire Aragão,[12] in the context of the Estado Novo and a concomitant deep shift in Brazil's public administration. These bylaws lent the institute greater organizational complexity, with its scientific areas divided into eight divisions, each organized into sections (Brasil, 1942). Formerly spread across various sections, administrative areas were now concentrated into one. Similarly, the decree provided for only one Auxiliary Section, which was responsible for the Office of Drawing and Photography. Staff of the various offices and other units within the Auxiliary Section were to be appointed by their heads, with the approval of the IOC director (art. 5).

Drawing and photography thus shared an administrative unit, and the list of duties suggests that photography played a bigger role:

> a) prepare maps, drawings, and graphs as required; b) perform photography services required by Divisions, Sections, and the Museum; c) organize photograph albums and collections to be sent to counterpart institutions; d) make photographic reproductions required for exhibits and demonstrations of I.O.C. activities; e) maintain collections under their charge, in an organized, well-conserved fashion (Brasil, 1942, art. 5, line V).

Only twenty years later did a new decree redefine bylaws for the IOC, then under the administration of Joaquim Travassos da Rosa[13] (Brasil, 1962). However, there were no substantive changes to the previous organizational structure.

For our purposes, however, it is interesting to note that this latest iteration of the bylaws did not provide for a specific unit devoted to drawing and photography, tasks that would be assigned to the Documentation and Museums Sector (Setor de Documentação e Museus), in turn subordinated to the Documentation Service (Serviço de Documentação) of the Division

[12] Henrique de Beaurepaire Rohan Aragão (1879-1956) graduated in 1905 from the Rio de Janeiro Faculty of Medicine. In 1903 he joined the Federal Serum Therapy Institute (renamed the IOC in 1908), where he held the posts of researcher, professor, head of service, and director (1942-1949). He studied protozoans, viruses, bacteria, and ticks.

[13] Joaquim Travassos da Rosa (1898-1967) graduated from the Rio de Janeiro Faculty of Medicine in 1914. He then worked for the Rio Grande do Sul Directorate of Hygiene and the Butantan Institute. In 1948, he began working at the IOC, where he served as head of the Rickettsias Section and director (1961-1964). He also held the posts of head of the Virus Division at the University of Brazil and advisor to the Ministry of Health and the Special Public Health Service Foundation. His research focused on medical and public health issues in the fields of bacteriology and virology.

of Teaching and Documentation (Divisão de Ensino e Documentação). Now part of the IOC's third tier, drawing and photography were therefore assigned to the administrative unit that primarily oversaw the institute's museum and documentation activities, possibly signaling a shift in how the institute perceived the status and purpose of drawings.

The Oswaldo Cruz Institute Foundation (Fiocruz)[14] was created in 1970, when José Guilherme Lacorte[15] was at the helm. Established as a not-for-profit organization with direct ties to the Ministry of Health, Fiocruz brought together several health institutes under its umbrella: the IOC; the Fernandes Figueira Institute (part of the National Children's Department); the National Institute of Rural Endemic Diseases and Prophylactic Products Service (Instituto Nacional de Endemias Rurais e Serviço de Produtos Profiláticos), of the National Department of Rural Endemic Diseases (Departamento Nacional de Endemias Rurais); the Evandro Chagas Institute, of the Public Health Services Foundation (Fundação Serviços de Saúde Pública, or FSESP); and the Leprology Institute, of the National Leprosy Service (Serviço Nacional da Lepra) (Brasil, May 1970). The decree approving the new agency's statutes was published in August of the same year. They defined the highest tiers within the organization while leaving it up to the lower tiers to define their own internal bylaws governing organization and the assignment of duties (Brasil, Aug. 1970). From then on, information on the activity of drawing was no longer part of Fiocruz's central bylaws and statutes, leaving this pathway closed to further investigation.

This was the same year that Fiocruz suffered the consequences of Institutional Acts 5 and 10 (AI-5 and AI-10), which stripped some IOC researchers of their political rights and forced them into retirement, including the entomologists Herman Lent, Hugo de Souza Lopes, and Sebastião José de Oliveira.[16] At that time, the cabinets housing the Entomology Collection were moved to the basement of Evandro Chagas Hospital, located on the Manguinhos *campus*, where they were held under grim storage conditions (Oliveira & Messias, 2005).

In 1977, the Entomological Collection returned to its original location, in the Moorish Pavilion, although various specimens had been irremediably lost. The collection was expanded and modernized in the late 1980s and now holds approximately five million specimens (Costa, 2008).

The activity of scientific drawing as expressed in archival collections

This search for IOC archive records that might shed light on the operational dynamics of the units responsible for scientific illustration placed priority on the record species and types most likely to provide information on the regulation and operation of these units and their sectors, encompassing therein administrative rulings (*portarias*), notifications, official letters (*ofícios*), service orders, and reports. However, no relevant information was found; to the contrary, there was a dearth of records on the service's structure, professional performance norms, work organization and routines, and other methodization of activities at the institute.[17] In brief, the few records of these types that were located date from the late 1940s through early 1960s, with service orders being the most common record type. Only one of them stipulated any rules regarding the production of drawings. While the purpose of this document was to regulate the activity of IOC publications, it established standards for presentations and materials used in drawings produced for the purpose of printed illustrations:

[14] Under the decree that restructured the Ministry of Health (Brasil, 1974), the Fundação Instituto Oswaldo Cruz (Fiocruz) was renamed the Fundação Oswaldo Cruz; the acronym was maintained.

[15] José Guilherme Lacorte (1900-1983) graduated from the Rio de Janeiro Faculty of Medicine in 1926. He inaugurated his career with the IOC as an intern at Carlos Chagas's laboratory in 1922. He served as a researcher and a professor of bacteriology and immunology. From 1969 to 1970, he was director of the IOC and first president of Fiocruz. From 1970 to 1973, he headed the President Castelo Branco Institute, now the National Public Health School (Escola Nacional de Saúde Pública, or ENSP).

[16] In 1970, under AI-5 and AI-10, the government that had seized power in 1964 stripped ten IOC researchers of their political rights and forced them into retirement (i.e., Haity Moussatché, Herman Lent, Moacyr Vaz de Andrade, Augusto Cid de Mello Perissé, Hugo de Souza Lopes, Sebastião José de Oliveira, Fernando Braga Ubatuba, Tito Arcoverde de Albuquerque Cavalcanti, Masao Goto, and Domingos Arthur Machado Filho). Herman Lent recounts the episode in the book *O massacre de Manguinhos* (Lent, 1978). Following re-democratization, the researchers were put back on the Fiocruz payroll, in 1986. See also Santos, 2020.

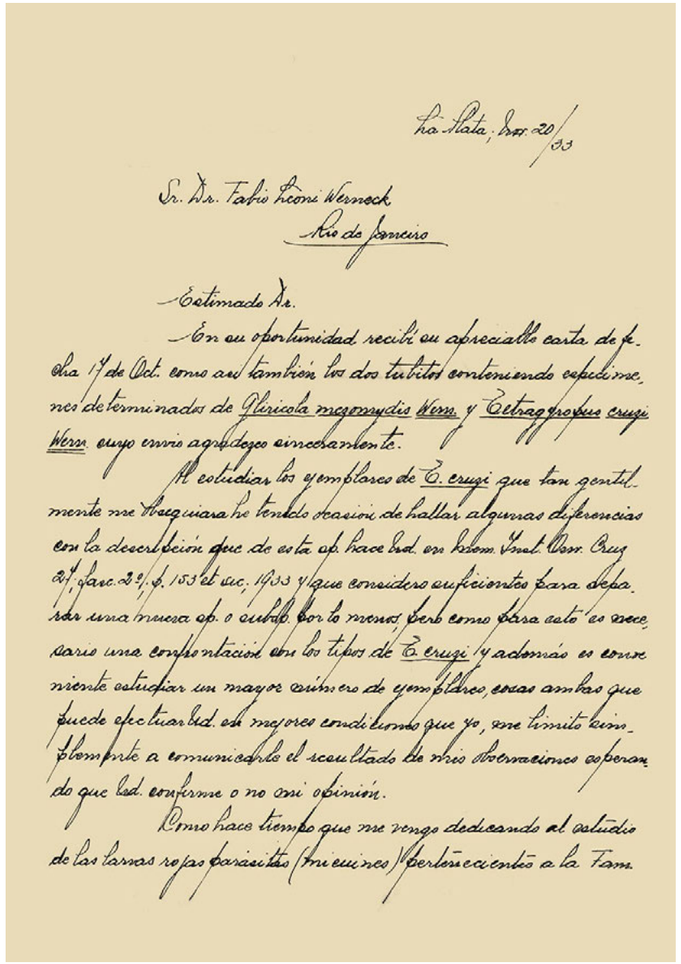
[17] An effort was made to locate these records among the dossiers on administrative rulings (*portarias*), notifications, official letters (*ofícios*), circular letters, and service orders held in the Oswaldo Cruz fonds, Direction Section, which covers the period of 1908-1971.

> Graphs, drawings, and photographs should all be treated as figures and presented solely in accordance with strict requirements, the latter being produced using India ink. Each figure should be accompanied by an explanatory caption. All illustrational material should be presented so that it can be reproduced photographically without touch-up, always bearing in mind the most economical presentation. The publications sector is responsible for the layout and use of this material in the text or isolated plates.[18]

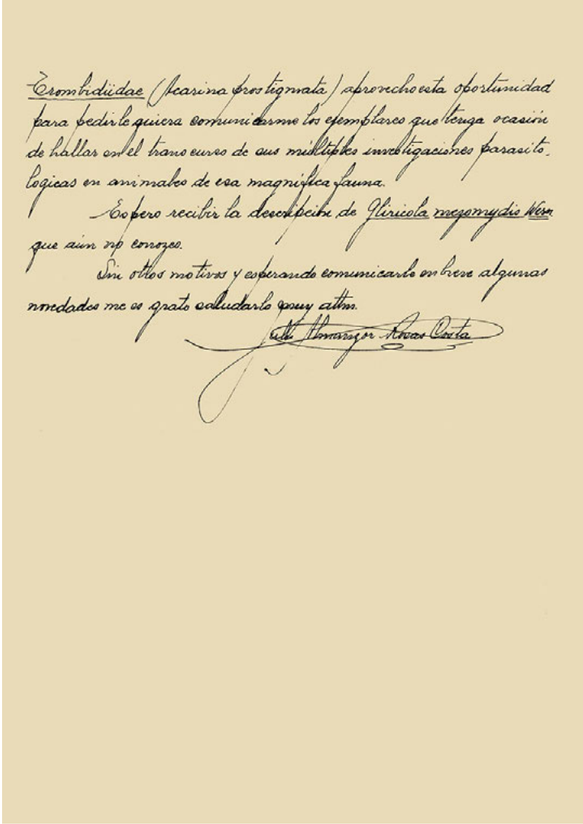
In researching the archives of IOC researchers who focused on entomology, the study identified record types that reveal some of the ways in which drawings fit into the *modus operandi* of scientific work. In this regard, the most relevant records were letters, laboratory notebooks, drawings themselves, and plates, the latter comprising an assemblage of one or more drawings on paperboard, which served as a support, with a small series of related drawings appearing in one frame.

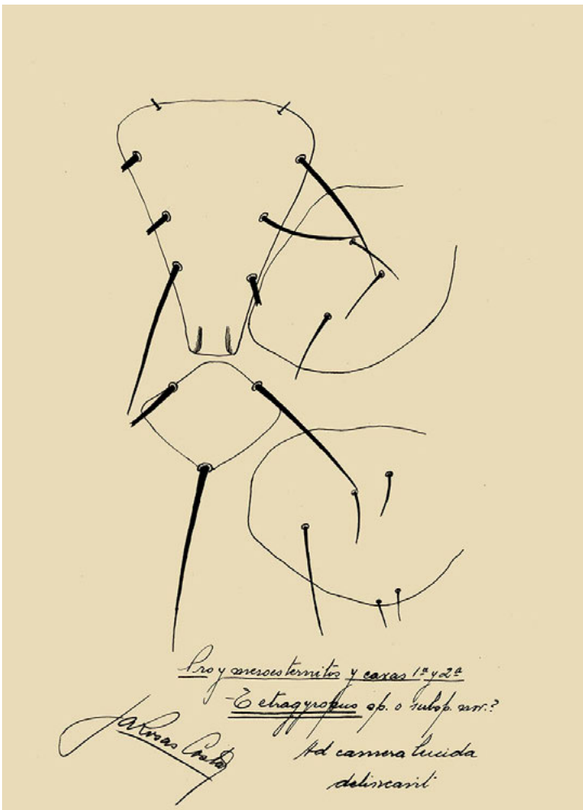
The letters are often accompanied by insect specimens, since this type of exchange was quite common among researchers working with taxonomy and the compilation of scientific collections. The specimens were sent off for study by means of comparison, observation, and the detection of differences in relation to species already described; if appropriate, a new species would then be delineated. A researcher's correspondence might also involve descriptions of new species and be accompanied by drawings. When few specimens of the insect under analysis were available, a drawing would be sent in its stead.

The main purpose of the laboratory notebooks was to log daily notes on all procedures adopted in the laboratory environment. They contain assorted information, collected and managed by the activity's maestro—the researcher—and their main purpose was, and still is, to register and preserve a record of operations.[19] The laboratory notebooks contain, for example, detailed descriptions of the process of capturing specimens, egg laying, and the conservation of eggs for drawings. These descriptions might be textual,



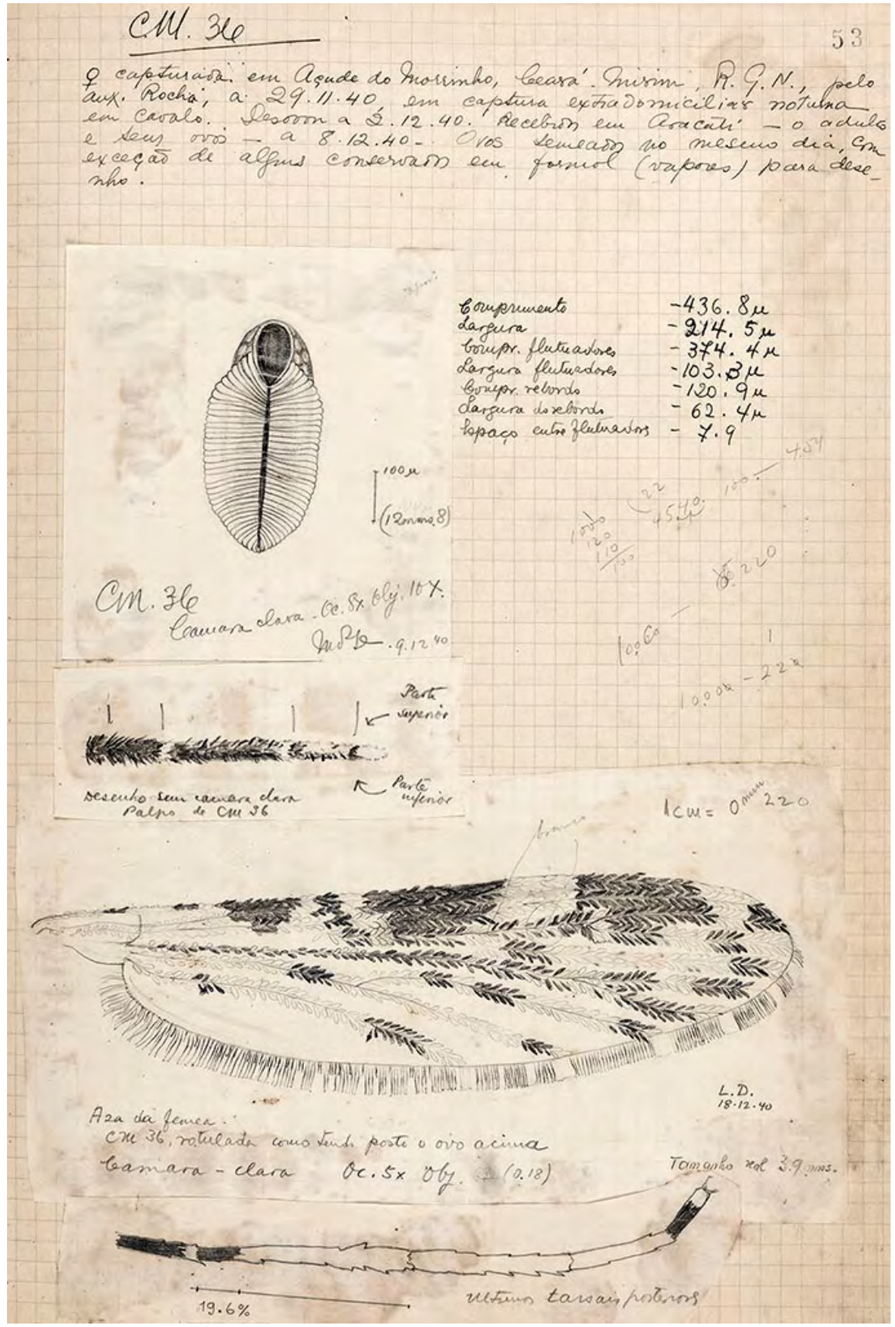
Letter sent to Fábio Leoni Werneck, IOC specialist in lice, with drawings enclosed for his evaluation, done by the researcher Julio Almanzor Rosas Costa
La Plata, Argentina
1933





[18] Ordem de serviço n. 25/60, de 9 fev. 1960. Fundo Instituto Oswaldo Cruz, seção Direção, dossiê Ordens de serviços expedidas e recebidas pelos diferentes departamentos e sessões do IOC... It should be pointed out that India ink was always the main medium used in scientific drawings at the IOC, as evinced by the items found in the collection prior to this norm.

[19] On laboratory notebooks, see Santos, Borges & Lourenço, 2019.



Page from the laboratory notebook of Leônidas de Mello Deane and Maria José von Paumgartten Deane, with annotations and drawings of the egg, palpus, wing, and leg of a female *Anopheles oswaldoi* (Peryassú, 1922), captured in Açude do Morrinho, Ceará-Mirim, state of Rio Grande do Norte. Study done for the Malaria Service of the Northeast (Serviço de Malária do Nordeste) during the campaign to combat the *Anopheles gambiae* mosquito
1940
Graphite pencil and India ink; 32cm x 22cm

visual, or both; drawings were sometimes pasted into the notebook; and they were sprinkled with handwritten entries, such as whether a camera lucida had been used in its production. Many of the entries consisted of abbreviations and codes decipherable only by the initiated. The drawings vary in size and indicate measurements and aspects of specimens or parts of their morphological structure and organism.

The notes on the drawings and the way in which the plates were reproduced are suggestive of the context in which they were produced, circulated, and used during the creation of these visual representations, as well as how they were gathered for publication in scientific books and articles.

Personnel files were another archival source researched for this study. Given the purpose of this record type, it was possible to trace the paths of IOC illustrators in their capacities as staff or contributors and to systematize information on their admissions, job posts, duties, participation in expeditions and projects, temporary leaves of absence, and retirement. These personnel files were also used in compiling the bios of researchers who have produced illustrations in the past or present and were therefore included in the "Catalogue of illustrators."[20]

These personnel records proved a precious source on the job history of illustrators at the IOC from 1906 to 2013, as represented in the "Timeline of Manguinhos illustrators," which is part of this text. The following individuals were identified as holding the post of sketch artist or serving in that role: Antonio Rodrigues Leal, Antonio Viegas Pugas, Carlos Rudolf Fischer, Celio Albano, Edith da Fonseca Nogueira Penido, Joel Sampaio Antunes, José Eduardo Prado, José Tavares de Lacerda Sobrinho, Luiz Augusto Cordeiro, Luiz Kattenbach, Manoel de Castro Silva, Raymundo Honório Daniel, Raymundo Porciúncula de Moraes, Renée Ferreira de Melo, Waldir dos Santos Botelho, and Walter Alves da Silva. This temporal representation of the work of these professionals at the IOC lets us observe them as generations who shared the same craft. From a technical

[20] The use and release of data drawn from personnel files for the purpose of this study complies with personal information laws. We would like to thank the Coordenação Geral de Gestão de Pessoas (Cogepe), of Fiocruz, for authorizing research of the personnel files of sketch artists from the 1960s and 1970s.

standpoint, the timeline is a useful tool for approximating the dates of the drawings and assigning authorship to anonymous illustrations.

The records found in these archives register activities that ceased long ago. The reasons for their creation, the actors involved in creating them, and the circumstances that enabled their use and circulation are all part of a context that is vital to understanding archival records but that should not be confused with their content. At the same time, in their role as the marks of a material and institutional culture over time,

Manoel de Castro Silva portrayed in a posthumous tribute by his IOC colleague, the illustrator Raymundo Honório Daniel
1934

these records offer us elements that can serve to prompt research into the practices responsible for their existence. This type of study, which begins with records from the past and then draws relationships between them and contemporary records in order to shed light on the reasons for their creation and on these figures and circumstances, is therefore a valuable initiative in the endeavor to understand archives and archival records. The findings from this study revealed previously unavailable information that, once gathered, can help researchers who are interested in drawings as a part of scientific activity. They also lent greater visibility to this documentation, in turn affording further access and consequently new circuits of use and meaning for these drawings.

REFERENCES

ARAGÃO, Henrique de Beaurepaire. Notícia histórica sobre a fundação do Instituto Oswaldo Cruz (Instituto de Manguinhos). *Memórias do Instituto Oswaldo Cruz*, Rio de Janeiro, v.48, p.1-50, 1950. https://www.scielo.br/pdf/mioc/v48/tomo48(fu)_1-50.pdf (accessed March 10, 2019)

ARAÚJO-JORGE, Tania Cremonini de; BARBOSA, Helene Santos; LOURENÇO-DE-OLIVEIRA, Ricardo (org.). *Uma escola para a ciência e a saúde*: 111 anos de ensino no Instituto Oswaldo Cruz. Rio de Janeiro: Fundação Oswaldo Cruz, Instituto Oswaldo Cruz, 2012. http://www.fiocruz.br/ioc/media/Livro_111%20anos%20do%20Ensino%20no%20IOC.pdf (accessed June 12, 2019).

BENCHIMOL, Jaime Larry (coord.). *Manguinhos do sonho à vida*: a ciência na *belle époque*. Rio de Janeiro: Casa de Oswaldo Cruz, 1990.

BENCHIMOL, Jaime Larry; TEIXEIRA, Luiz Antonio. *Cobras, lagartos & outros bichos*: uma história comparada dos institutos Oswaldo Cruz e Butantan. Rio de Janeiro: Editora UFRJ, 1993.

BRASIL. *Decreto n. 1.802, de 12 de dezembro de 1907*. Cria o Instituto de Patologia Experimental de Manguinhos. LEXML. https://www.lexml.gov.br/urn/urn:lex:br:federal:decreto:1907-12-12;1802 (accessed September 10, 2019).

BRASIL. *Decreto n. 6.891, de 19 de março de 1908*. Aprova, para o Instituto de Patologia Experimental de Manguinhos, que passa a denominar-se Instituto "Oswaldo Cruz", o regulamento a que se refere o art. 3º do decreto n. 1.802, de 12 de dezembro de 1907. LEXML. https://www.lexml.gov.br/urn/urn:lex:br:federal:decreto:1908-03-19;6891 (accessed September 10, 2019).

BRASIL. *Decreto n. 17.512, de 5 de novembro de 1926*. Dá novo regulamento ao Instituto Oswaldo Cruz. LEXML. https://www.lexml.gov.br/urn/urn:lex:br:federal:decreto:1926-11-05;17512 (accessed September 10, 2019).

BRASIL. *Decreto n. 19.402, de 14 de novembro de 1930*. Cria uma Secretaria de Estado com a denominação de Ministério dos Negócios da Educação e Saúde Pública. LEXML. https://www.lexml.gov.br/urn/urn:lex:br:federal:decreto:1930-11-14;19402 (accessed September 10, 2019).

BRASIL. *Decreto n. 19.444, de 1 de dezembro de 1930*. Dispõe sobre os serviços que ficam a cargo do Ministério da Educação e Saúde Pública e dá outras providências. LEXML. https://www.lexml.gov.br/urn/urn:lex:br:federal:decreto:1930-12-01;19444 (accessed September 10, 2019).

BRASIL. *Decreto n. 20.043, de 27 de maio de 1931*. Aprova o regulamento do Departamento Nacional de Medicina Experimental. LEXML. https://www.lexml.gov.br/urn/urn:lex:br:federal:decreto:1931-05-27;20043 (accessed September 10, 2019).

BRASIL. *Decreto n. 22.036, de 31 de outubro de 1932*. Modifica o Departamento Nacional de Medicina Experimental, passando os respectivos serviços a constituir em Instituto com a denominação de "Instituto Osvaldo Cruz". LEXML. https://www.lexml.gov.br/urn/urn:lex:br:federal:decreto:1932-10-31;22036 (accessed September 10, 2019).

BRASIL. *Decreto n. 10.252, de 14 de agosto de 1942*. Aprova o Regimento do Insti-tuto Oswaldo Cruz. LEXML. https://www.lexml.gov.br/urn/urn:lex:br:federal:decreto:1942-08-14;10252 (accessed September 10, 2019).

BRASIL. *Decreto do Conselho de Ministros n. 832, de 3 de abril de 1962*. Aprova o Regimento do Instituto Oswaldo Cruz, do Ministério da Saúde. (Regimento anexo). https://www2.camara.leg.br/legin/fed/decmin/1960-1969/decretodoconselhodeministros-832-3abril-1962-352978-publicacaooriginal-1-pe.html (accessed September 10, 2019).

BRASIL. *Decreto n. 66.624, de 22 de maio de 1970*. Dispõe sobre a Fundação Instituto Oswaldo Cruz. LEXML. https://www.lexml.gov.br/urn/urn:lex:br:federal:decreto:1970-05-22;66624 (accessed September 10, 2019).

BRASIL. *Decreto n. 67.049, de 13 de agosto de 1970*. Aprova o Estatuto da Fundação Instituto Oswaldo Cruz e dá outras providências. LEXML. https://www.lexml.gov.br/urn/urn:lex:br:federal:decreto:1970-08-13;67049 (accessed September 10, 2019).

BRASIL. *Decreto n. 74.891, de 13 de novembro de 1974*. Dispõe sobre a estrutura básica do Ministério da Saúde e dá outras providências. https://www2.camara.leg.br/legin/fed/decret/1970-1979/decreto-74891-13-novembro-1974-423367-publicacaooriginal-1-pe.html (accessed September 10, 2019).

CASTRO, Maria Werneck de. *Natureza viva*: memórias, carreira e obra de uma pioneira do desenho científico no Brasil. Organização Moacir Werneck de Castro. Rio de Janeiro: Edições Biblioteca Nacional, 2004.

CORREIA, Fernando A ilustração científica: "santuário" onde a arte e a ciência comungam. *Visualidades*, Goiânia, v.9, n.2, p.221-239, jul./dez. 2011.

COSTA, Jane *et al*. Coleção entomológica do Instituto Oswaldo Cruz: resgate de acervo científico-histórico disperso pelo Massacre de Manguinhos. *História, Ciências, Saúde – Manguinhos*, Rio de Janeiro, v.15, n.2, p.401-410, abr./jun. 2008. https://www.scielo.br/pdf/hcsm/v15n2/10.pdf (accessed June 14, 2020).

CRUZ, Oswaldo Gonçalves. Contribuição para o estudo dos culicidios do Rio de Janeiro. *Brazil-Medico*, Rio de Janeiro, ano 15, n.43, p.423-426, 1901.http://memoria.bn.br/DocReader/081272/8918 (accessed July 14, 2019).

DANTES, Maria Amélia Mascarenhas. Institutos de pesquisa científica no Brasil. *In*: FERRI, Mário Guimarães; MOTOYAMA, Shozo (coord.). *História das ciências no Brasil*. São Paulo: EPU: Edusp, 1980. p.343-380.

FABRIS, Annateresa; KERN, Maria Lúcia Bastos (org.). *Imagem e conhecimento*. São Paulo: Edusp, 2006.

FELIX, Márcio. Entrevista concedida à equipe do projeto de pesquisa A Imagem a Serviço do Conhecimento. Rio de Janeiro, 4 set. 2017.

FONSECA FILHO, Olympio da. *A escola de Manguinhos*: contribuição para o estudo do desenvolvimento da medicina experimental no Brasil. São Paulo: EGTR, 1974.

INSTITUTO Soroterápico Federal. *In*: DICIONÁRIO histórico-biográfico das ciências da saúde no Brasil (1832-1930). Rio de Janeiro: Casa de Oswaldo Cruz/Fiocruz, s.d. http://www.dichistoriasaude.coc.fiocruz.br/iah/pt/verbetes/instsorofed.htm (accessed September 10, 2019).

JURBERG, José. Entrevista concedida à equipe do projeto de pesquisa A Imagem a Serviço do Conhecimento. Rio de Janeiro, 1 ago. 2018.

LACERDA, Aline Lopes de *et al*. A imagem a serviço do conhecimento: um estudo sobre a ilustração científica no Instituto Oswaldo Cruz. *Cadernos de História da Ciência*, São Paulo, v.12, n.1, p.90-110, jan./jun. 2016. https://www.arca.fiocruz.br/handle/icict/31382 (accessed February 4, 2022).

LENT, Herman. Nova espécie de "*Triatoma*" da região oriental (Hemiptera, Reduviidae). *Revista Brasileira de Biologia*, Rio de Janeiro, v.13, n.4, p.315-319, 1953.

LENT, Herman. *O massacre de Manguinhos*. Rio de Janeiro: Avenir, 1978.

LIMA, A. da Costa. *Insetos do Brasil*. Rio de Janeiro: Escola Nacional de Agronomia, 1938. tomo 1, cap.1-21.

LIMA, Alessandro Rodrigues; PEREIRA, Rosa Maria Alves. Ilustrando insetos. *In*: PEREIRA, Rosa Maria Alves (org.). *Ilustração zoológica*. Belo Horizonte: Frente Verso, 2016. p.73-80.

OLIVEIRA, Ricardo Lourenço de; CONDURU, Roberto. Nas frestas entre a ciência e a arte: uma série de ilustrações de barbeiros do Instituto Oswaldo Cruz. *História, Ciências, Saúde – Manguinhos*, Rio de Janeiro, v.11, n.2, p.335-384, ago. 2004. https://www.scielo.br/scielo.php?pid=S0104-59702004000200007&script=sci_arttext (accessed March 4, 2020).

OLIVEIRA, Sebastião José de; MESSIAS, Maria Conceição. Coleção Entomológica do Instituto Oswaldo Cruz. *In*: SIMPÓSIO NACIONAL DE COLEÇÕES CIENTÍFICAS, 1., 2005, Rio de Janeiro. *Anais* [...]. Rio de Janeiro: Instituto Oswaldo Cruz, 2005. p.53-55.

PEREIRA, Rosa Maria Alves (org.). *Ilustração zoológica*. Belo Horizonte: Frente Verso, 2016.

PINTO, César. *Tratado de parasitologia*: artrópodes parasitos e transmissores de doenças. Rio de Janeiro: Pimenta de Mello, 1930. v.4, tomo 1.

RAPATÃO, Vitória Sabino; PEIRÓ, Douglas Fernando. Ilustração científica na biologia: aplicação das técnicas de lápis de cor, nanquim (pontilhismo) e grafite. *Revista da Biologia*, São Paulo, v.16, n.1, p.7-14, 2016. http://www.revistas.usp.br/revbiologia/article/view/173950/162935 (accessed January 20, 201920).

SANTOS, Daniel Guimarães Elian dos. *Massacre de Manguinhos*: a ciência brasileira e o regime militar (1964-1970). São Paulo: Hucitec, 2020.

SANTOS, Paulo Roberto Elian dos; BORGES, Renata Silva; LOURENÇO, Francisco dos Santos. Documentos de arquivo produzidos pela atividade científica: uma análise dos cadernos de laboratório do Instituto Oswaldo Cruz. *História, Ciências, Saúde – Manguinhos*, Rio de Janeiro, v.26, n.3, p.1013-1025, jul./set. 2019. https://www.scielo.br/pdf/hcsm/v26n3/0104-5970-hcsm-26-03-1013.pdf (accessed August 28, 2019).

SCHWARTZMAN, Simon. *Um espaço para a ciência*: a formação da comunidade científica no Brasil. Brasília: Ministério de Ciência e Tecnologia, 2001.

SICARD, Monique. *A fábrica do olhar*: imagens da ciência e aparelhos de visão (séculos XV-XX). Lisboa: Edições 70, 2006.

Timeline of Manguinhos illustrators

Based on the sketch artists' personnel files, the timeline features those who worked at the institution between 1906 and 2013.

Given the concise graphic nature of timelines, only the year that the sketch artists joined or left the institute has been indicated, while we have omitted short-term leaves of absence or promotions, except for appointments to the post of head sketch artists, which for a long time was the highest position a sketch artists could attain at the institute. Since some of these individuals were initially hired in positions other than that of sketch artists, the timeline also indicates job title at the time of hiring, when this information was available in the personnel files.

During the time period examined in this study, the personnel files used several names to designate what was basically the same job function: *ajudante de desenhista*, *auxiliar de desenhista*, *desenhista auxiliar*, and *auxiliar de desenho*. For the purposes of simplification, the term "sketch artist aide" has been used to designate all four of these job titles in the English translation of the Timeline and the following chapter.

1900

Federal Serum Therapy Institute
Established

1906

MANOEL DE CASTRO SILVA
Joined the staff (sketch artist)

1907

Manguinhos Institute of Experimental Pathology
Renamed

1908

Oswaldo Cruz Institute
Renamed

1912

CARLOS RUDOLF FISCHER
Joined the staff (sketch artist)

1915

RAYMUNDO HONÓRIO DANIEL
Joined the staff (junior aide)

1917

CARLOS RUDOLF FISCHER
Discharged

LUIZ AUGUSTO CORDEIRO
Joined the staff (sketch artist aide)

1919

LUIZ AUGUSTO CORDEIRO
Died

1920

ANTONIO VIEGAS PUGAS
Joined the staff (junior laboratory aide)

RAYMUNDO PORCIÚNCULA DE MORAES
Joined the staff (sketch artist aide)

1921

RAYMUNDO HONÓRIO DANIEL
Discharged (junior laboratory aide)

LUIZ KATTENBACH
Joined the staff (sketch artist aide)

1926

ANTONIO RODRIGUES LEAL
Joined the staff (sketch artist with the IOC Tropical Diseases Hospital)

1927

RAYMUNDO HONÓRIO DANIEL
Joined the staff (sketch artist)

1928

LUIZ KATTENBACH
Last record in the personnel files

1930

EDITH DA FONSECA NOGUEIRA PENIDO
Joined as a laboratory volunteer

1931

MANOEL DE CASTRO SILVA
Appointed head sketch artist

ANTONIO VIEGAS PUGAS
Appointed sketch artist aide

ANTONIO RODRIGUES LEAL
Appointed sketch artist aide

1934

MANOEL DE CASTRO SILVA
Died

RAYMUNDO PORCIÚNCULA DE MORAES
Appointed head sketch artist

EDITH DA FONSECA NOGUEIRA PENIDO
Appointed sketch artist aide

1938

RAYMUNDO PORCIÚNCULA DE MORAES
Discharged at his request

1940

JOSÉ TAVARES DE LACERDA SOBRINHO
Joined the staff (sketch artist)

1943

JOSÉ TAVARES DE LACERDA SOBRINHO
Discharged

ANTONIO RODRIGUES LEAL
Retired

1944

RAYMUNDO HONÓRIO DANIEL
Discharged

1952

WALDIR DOS SANTOS BOTELHO
Joined the staff (sketch artist)
Discharged

1954

CELIO ALBANO
Joined the staff (sketch artist)

1955

RENÉE FERREIRA DE MELO
Joined the staff (sketch artist aide)

1956

ANTONIO VIEGAS PUGAS
Retired

1960

ANTONIO VIEGAS PUGAS
Joined the staff (specialized sketch artist)

WALTER ALVES DA SILVA
Joined the staff (cartographer)

JOEL SAMPAIO ANTUNES
Joined the staff (cartographer)

1961

WALTER ALVES DA SILVA
Joined by permanent transfer (*ex officio*)

JOEL SAMPAIO ANTUNES
Discharged

1963

ANTONIO VIEGAS PUGAS
Discharged

CELIO ALBANO
Transferred (*ex officio*)

EDITH DA FONSECA NOGUEIRA PENIDO
Retired

1964

--
Appointed head of the Documentation and Museums Sector

1968

WALTER ALVES DA SILVA
Appointed (sketch artist)

1969

JOEL SAMPAIO ANTUNES
Joined the staff (technical artist)

1970

Fiocruz
Established

1976

JOSÉ EDUARDO PRADO
Joined the staff (technical sketch artist)

1977

RENÉE FERREIRA DE MELO
Retired

WALTER ALVES DA SILVA
Retired

1995

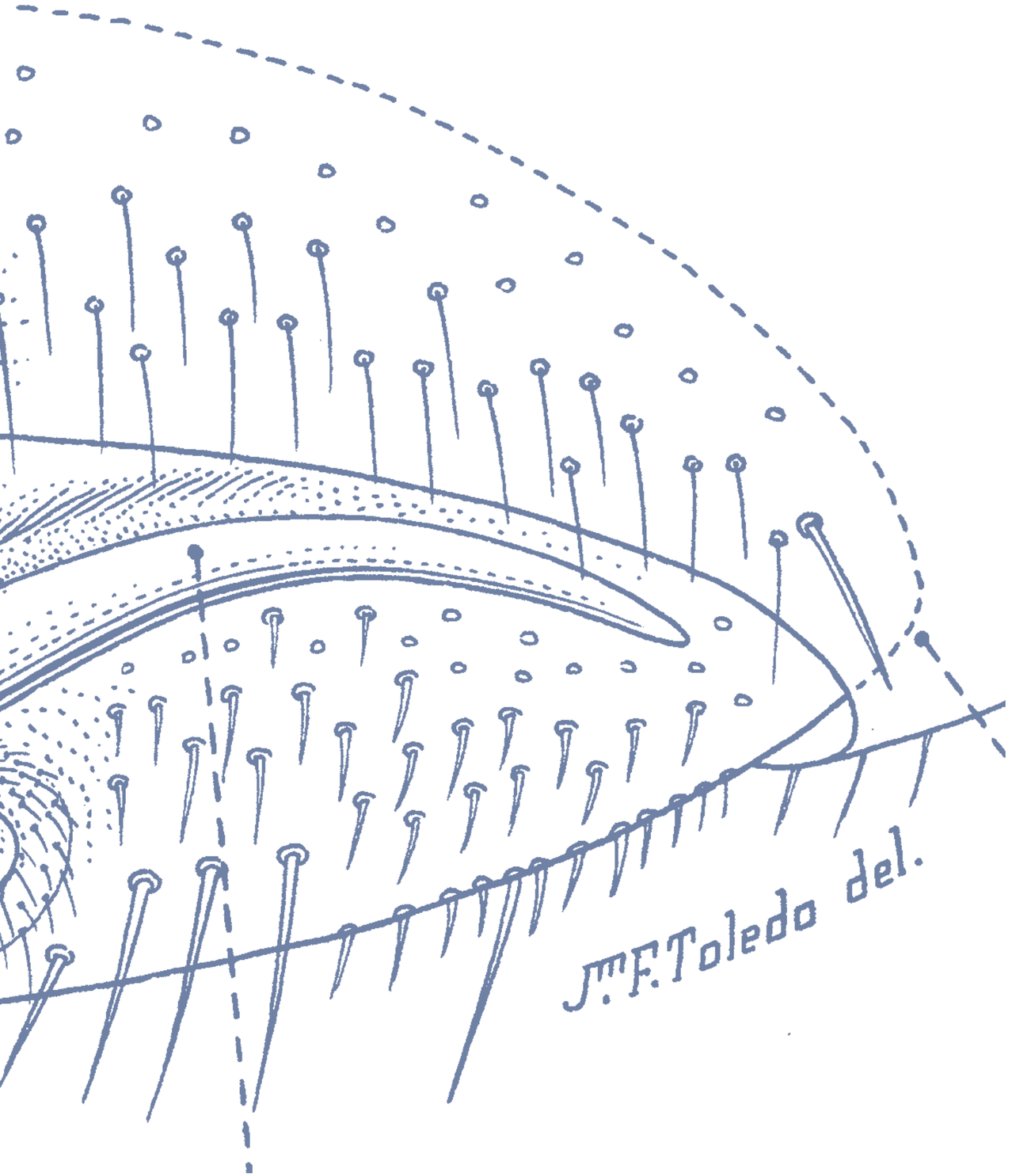
JOEL SAMPAIO ANTUNES
Died

2013

JOSÉ EDUARDO PRADO
Retired

Catalogue of illustrators

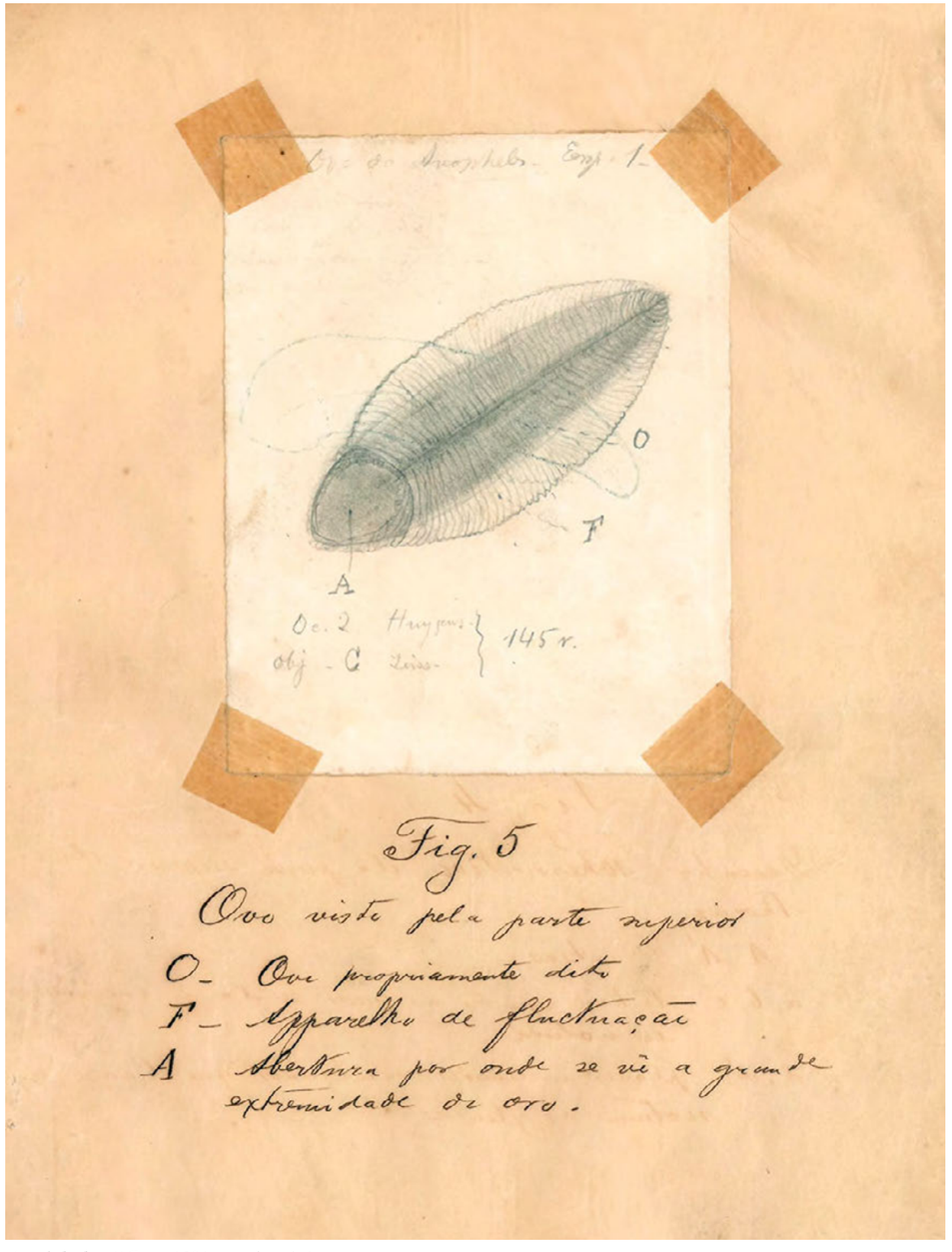
Oswaldo Gonçalves Cruz
Alberto Federman
Angelo Moreira da Costa Lima
Antonio Viegas Pugas
Carlos Leal Lacerda
Carlos Rudolf Fischer
Dyrce Lacombe de Almeida
Fábio Leoni Werneck
Gordon Floyd Ferris
Henrique da Rocha Lima
Hugo de Souza Lopes
Joaquim Franco de Toledo
José Jurberg
Leônidas de Mello Deane
Luiz Kattenbach
Manoel de Castro Silva
Marcos Kogan
Maria José von Paumgartten Deane
Martín Ladislao Aczél
Octâvio Mangabeira Filho
Petr Wolfgang Wygodzinsky
Raymundo Honório Daniel
Roger Pierre Hipolyte Arlé
Rubens Pinto de Mello
Other Manguinhos scketch artists



OSWALDO GONÇALVES CRUZ

Oswaldo Cruz was born on August 5, 1872, in São Luiz do Paraitinga, São Paulo. He entered the Rio de Janeiro Faculty of Medicine in 1887 and graduated in 1892. He then accepted an invitation from Egydio Salles Guerra to head the clinical analyses laboratory at the General Polyclinic of Rio de Janeiro; he also helped diagnose a cholera epidemic in the Paraíba Valley while at the Federal Sanitary Institute, led by Francisco Fajardo. In 1897 he and his family moved to Paris, where he specialized in microbiology at the Pasteur Institute, studied forensic medicine at the Toxicology Institute, and did specialized clinical training in urology. After returning to Brazil in 1899, he took part in the commission to fight the bubonic plague in Santos, headed by Eduardo Chapot-Prévost. The Baron of Pedro Affonso invited him to serve as technical director of the Federal Serum Therapy Institute, then under construction on Manguinhos Farm on the outskirts of Rio. In 1902, he assumed the post of director-general at the institute, where he devoted himself to bacteriology, hematology, and anatomic pathology. With his depareiscription of the *Anopheles lutzii* mosquito (1901) and the genus *Chagasia* (1906), he also contributed to research on mosquitoes as malaria vectors. The following year he was appointed director of the federal public health department, then known as the General Directorship of Public Health (Diretoria Geral de Saúde Pública – DGSP); as its head, he initiated a challenging public health campaign to fight yellow fever, bubonic plague, and smallpox in Rio de Janeiro. His proposed changes to Brazil's Sanitary Code included mandatory smallpox vaccination, and in 1904 a grassroots revolt exploded in response to this and other measures, followed soon after by a failed military coup. The so-called Vaccine Revolt was brutally repressed and took a heavy toll in lives, injuries, and arrests, but also prompted repeal of the mandatory vaccine law. In 1905 and 1906, Cruz undertook expeditions to the country's sea and river ports, where he implemented a series of public health measures, including defensive initiatives against diseases like

cholera, yellow fever, and the plague. In 1907 he accepted a gold medal on behalf of the Brazilian section at the 14th International Congress on Hygiene and Demography, held in Berlin; the medal honored Brazil's exhibit on the fight against yellow fever, no new cases of which had been reported in Rio de Janeiro that year. At the exposition in Dresden, Germany, in 1911, the discovery of Chagas disease earned the institution a second medal. By then the Oswaldo Cruz Institute (IOC) – the new name of the Federal Serum Therapy Institute since 1908 – had built a solid reputation in its field. Cruz had in fact left the DGSP in 1909 to dedicate himself entirely to the institute. He surveyed public health conditions in rural Brazil through IOC-sponsored expeditions, which included a malaria campaign in 1910 during construction of the Madeira-Mamoré Railway and a yellow fever campaign in Pará. In 1913 he was made a member of the Brazilian Academy of Letters and in 1914, an officer of the French Legion of Honor. Kidney disease forced him to leave his post at the IOC in early 1916. He moved to the nearby mountain town of Petrópolis, where he served as mayor at the appointment of Rio de Janeiro state governor Nilo Peçanha. He died on February 11, 1917, in Petrópolis.



Anopheles lutzii Cruz, 1901; egg, dorsal view
1901
Graphite pencil; 26.5cm x 20.5cm

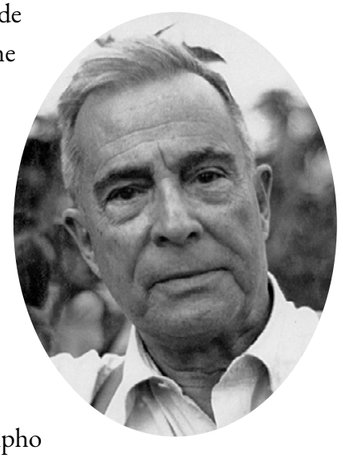
Anopheles lutzii Cruz, 1901; egg, lateral view
1901
Graphite pencil; 26.5cm x 20.5cm

ALBERTO FEDERMAN

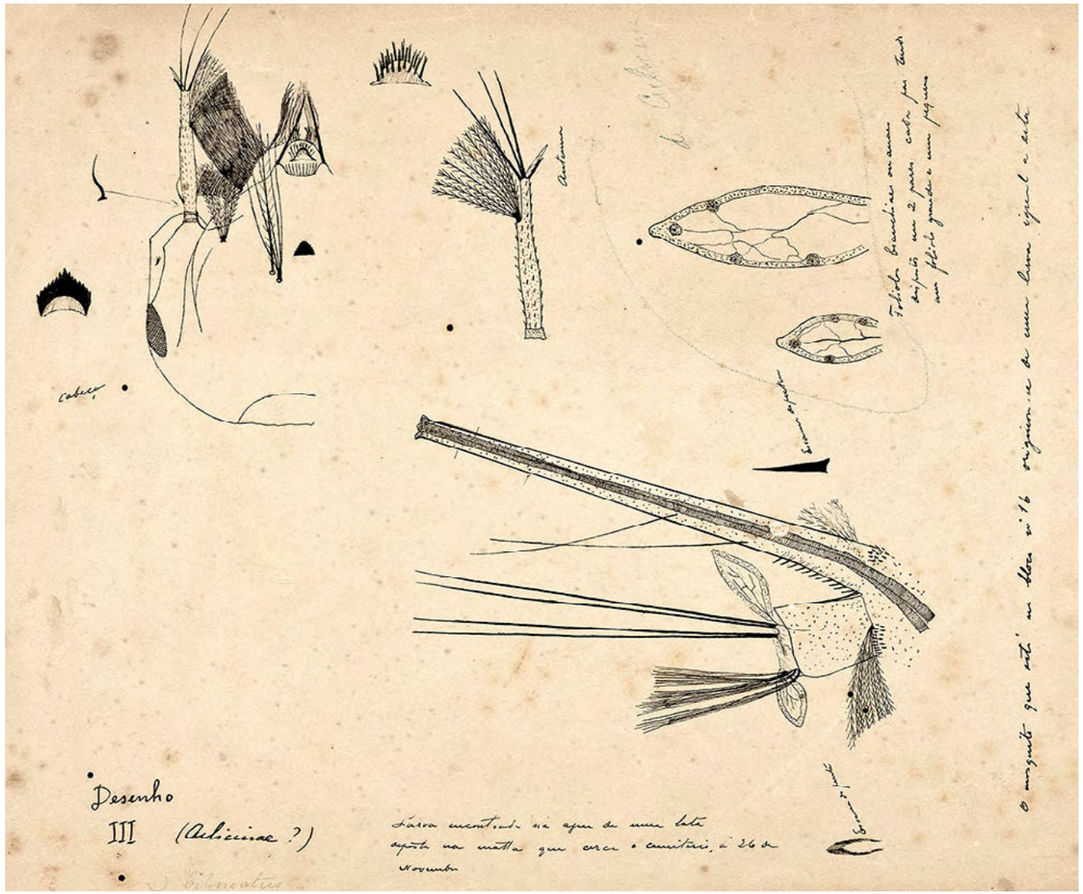
Alberto Federman was born on April 27, 1887, in Lerma, Italy. He studied painting in Paris, Milan, and Florence before moving to Brazil in the early 1910s. He spent some time as a photographer at the University of São Paulo medical school. That same decade, he presented his work at individual and collective art shows, such as the 13th General Fine Arts Exhibition in 1916 in Rio de Janeiro. In 1924, at the invitation of Arthur Neiva, he served as a photographer and sketch artist with the Commission to Study and Overcome the Coffee Borer, working alongside Carlos Rudolf Fischer and Joaquim Franco de Toledo. He also made an educational film about the coffee borer for the campaign. He was head of photomicrography within the Drawing and Photomicrography Section of the Biological Institute of Agricultural and Animal Defense (now the Biological Institute), a 1927 outgrowth of the commission. While there, he used photography to record the institute's day-to-day activities and, together with Bruno Ulisses Mazza, compiled a valuable iconographic collection. In 1941 he became a Brazilian citizen. He died in 1958 in the city of São Paulo.

Dorsal and lateral views of pupa of *Stephanoderes coffeae*, now *Hypothenemus hampei* (Ferrari, 1867).
Promotional material used in the fight against the coffee borer in São Paulo
1924-1927
India ink; 10cm x 9cm

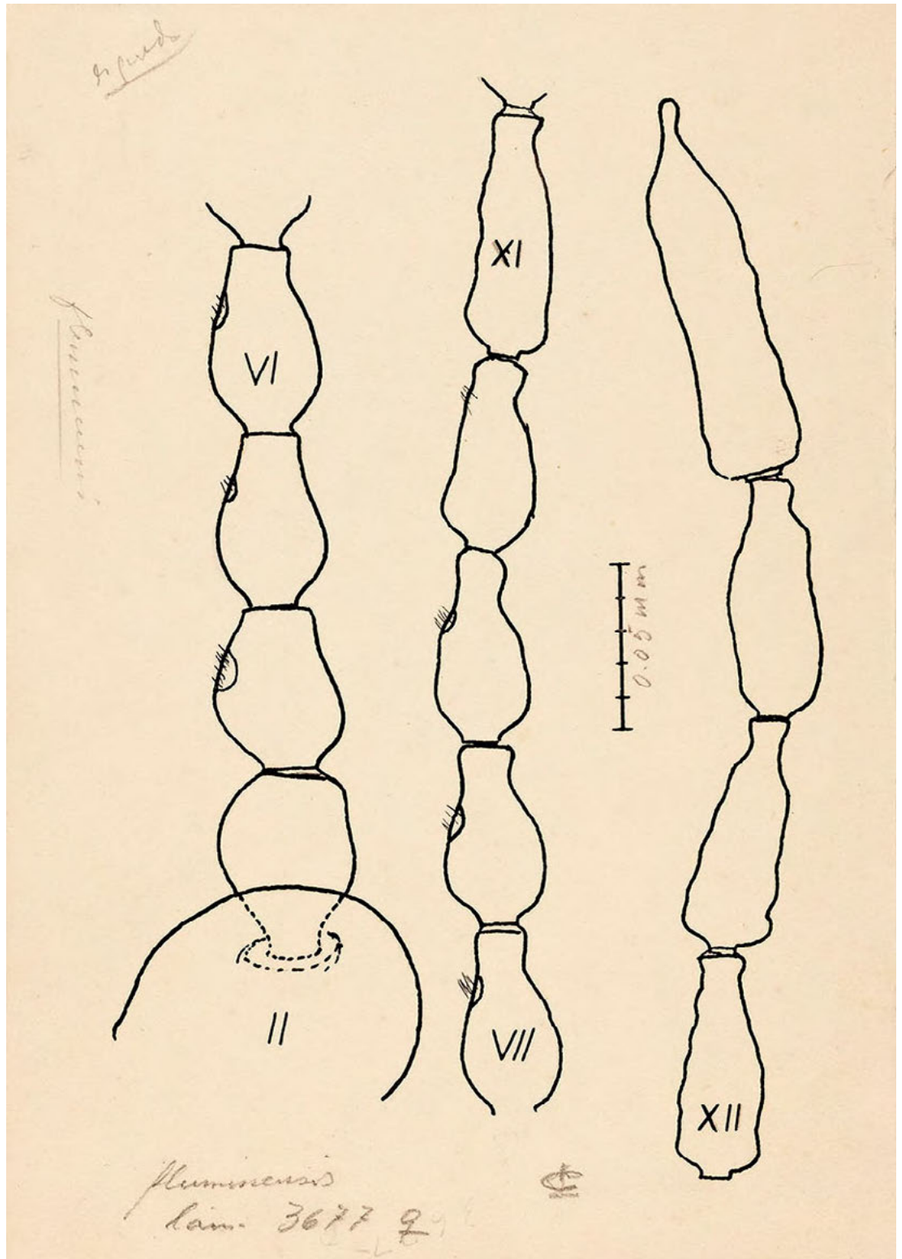
ANGELO MOREIRA DA COSTA LIMA



Angelo Costa Lima was born in the city of Rio de Janeiro on June 29, 1887. He graduated from the Rio de Janeiro Faculty of Medicine in 1910. While at school, he worked as an academic assistant with the Yellow Fever Prophylaxis Service in Rio, then the federal capital. From 1910 to 1913, he was a public health inspector with three yellow fever prevention commissions in the state of Pará: one in the city of Belém (headed by Oswaldo Cruz) and two others, in Santarém and Óbidos. He joined the staff at the IOC in 1913 as an intern at Adolpho Lutz's laboratory. The next year he attended the institute's Specialization Course and, at Oswaldo Cruz's recommendation, was appointed professor of agricultural entomology at the Higher School of Agricultural Science and Veterinary Medicine (later the National School of Agronomy and now the Federal Rural University of Rio de Janeiro). In 1916 he began working at the National Museum's Agricultural Entomology Laboratory, where he led the Service to Combat the Pink Bollworm (1918-1920). From 1920 to 1926, he headed the Service for Plant Health Surveillance, which was part of the Biological Institute of Agricultural Defense. In 1924, together with Arthur Neiva and Edmundo Navarro de Andrade, he took part in a commission assigned by the São Paulo state government to study the coffee borer and propose ways to fight it. Two years later, at the invitation of Carlos Chagas, he returned to the IOC, where he was a laboratory assistant and then laboratory head. He was the director of the Institute of Plant Biology from 1933 to 1934. When a new federal law prohibited government employees from holding more than one public post at a time, he chose to stay on as a professor at the National School of Agronomy in 1938, but continued conducting entomology research at the IOC, even after his retirement in 1956. He authored more than three hundred scientific papers and studied almost all insect groups, including Diptera, Coleoptera, Hymenoptera, Lepidoptera, Hemiptera, and Siphonaptera. The hallmark of his career was the publication of *Insetos do Brasil* (Insects of Brazil), a twelve-volume series released between 1938 and 1962. He died on May 20, 1964, in Rio de Janeiro.

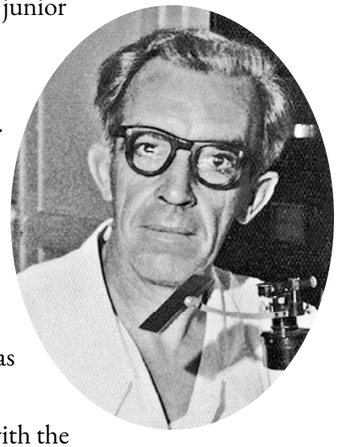


Structures of larvae of *Culex* sp., found in a can of water in the woods near a cemetery in Óbidos, Pará. Details show the morphology of head structures and posterior part of body. Comissão de Profilaxia Defensiva da Febre Amarela (Commission for Yellow Fever Prevention)
1912
India ink; 29.5cm x 23cm



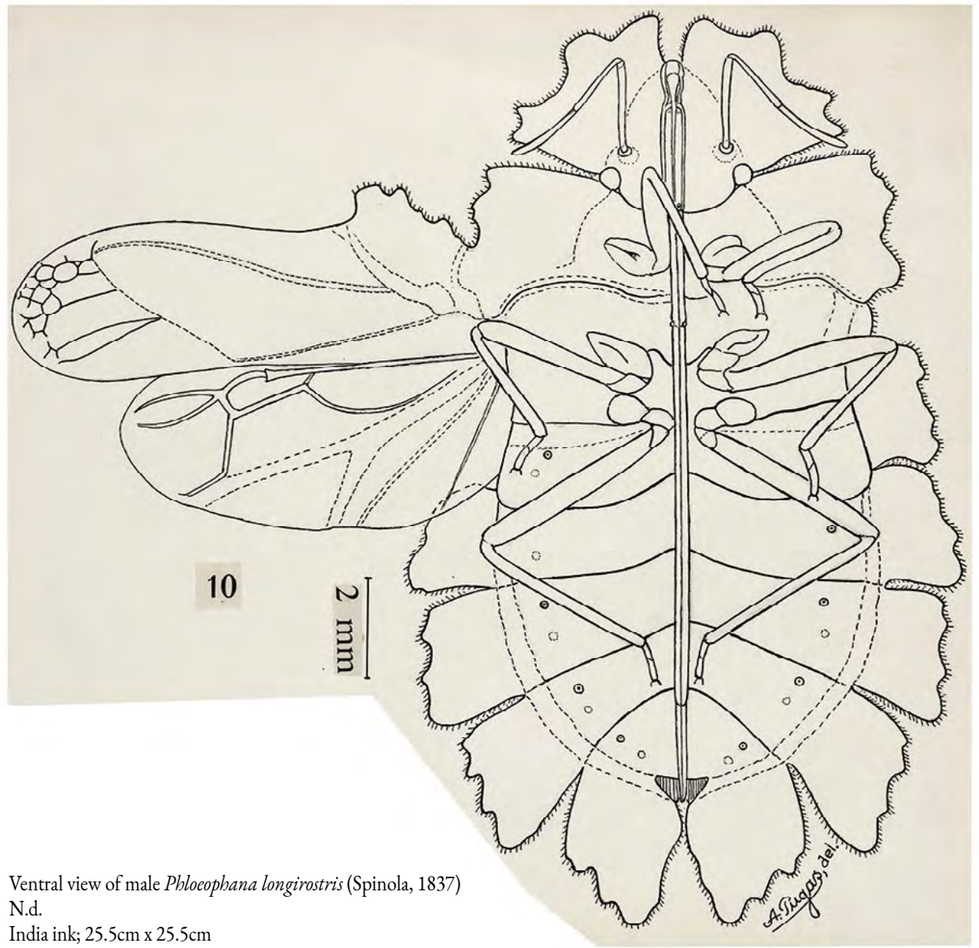
Forcipomyia fluminensis (unpublished species); antenna of female
N.d.
India ink; 18.5cm x 13cm

ANTONIO VIEGAS PUGAS



Antonio Pugas joined the IOC staff in 1920 as a junior laboratory aide and then began working there as a sketch artist, although he was only officially appointed to this post eleven years later, in 1931. He took his retirement in 1956. After he spent a period at the National Museum, the IOC re-hired him in 1960 as a specialized sketch artist; he stayed there for one year. During his first ten years at the institute, he took part in scientific expeditions in Rio de Janeiro and Minas Gerais. When yellow fever broke out in Rio de Janeiro in 1928-1929, he was assigned to work with the Argentinean researcher Alfredo Zuccarini, who came to the IOC to study the disease and had high praises for Pugas. In 1934 he was chosen to accompany the researcher Emmanuel Dias, who was investigating Chagas disease in Bambuí, Minas Gerais. He also contributed to publications by other researchers at the institute, including Adolpho Lutz, João Ferreira Teixeira de Freitas, Walter Oswaldo Cruz, Francisco Laranja, and Heráclides César de Souza Araújo. In 1951 Herman Lent applauded the quality of the illustrations Pugas had done for the re-publication of the researcher's monograph on Triatominae of the world. Lent also paid him tribute by naming a kissing bug *Triatoma pugasi* Lent, 1953. He died on February 3, 1972, in Rio de Janeiro.

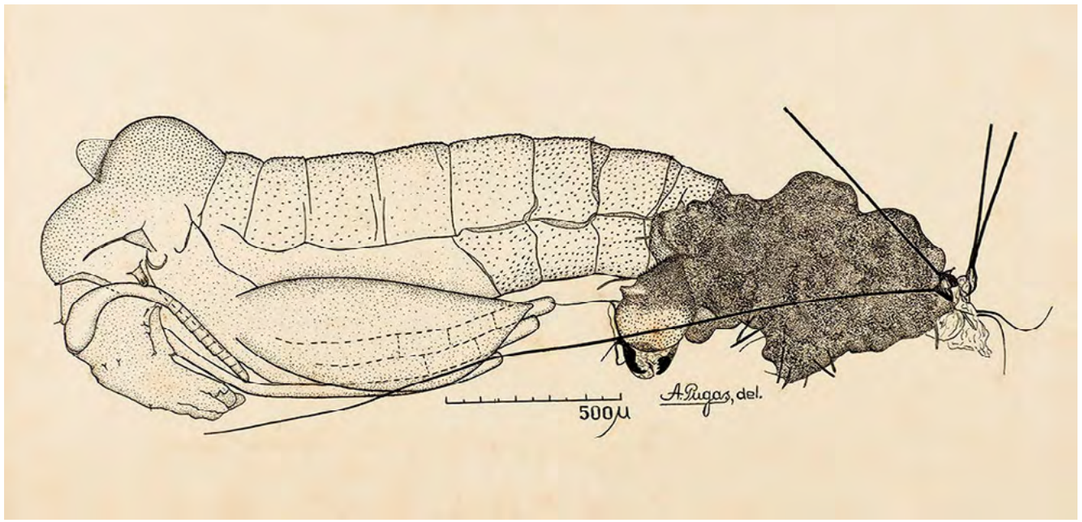
A. Pugas, del.



Ventral view of male *Phloeophana longirostris* (Spinola, 1837)
N.d.
India ink; 25.5cm x 25.5cm

Dorsal view of male *Panstrongylus diasi* Pinto & Lent, 1946 (kissing bug), vector of Chagas disease
N.d.
India ink and watercolor; 25cm x 18cm

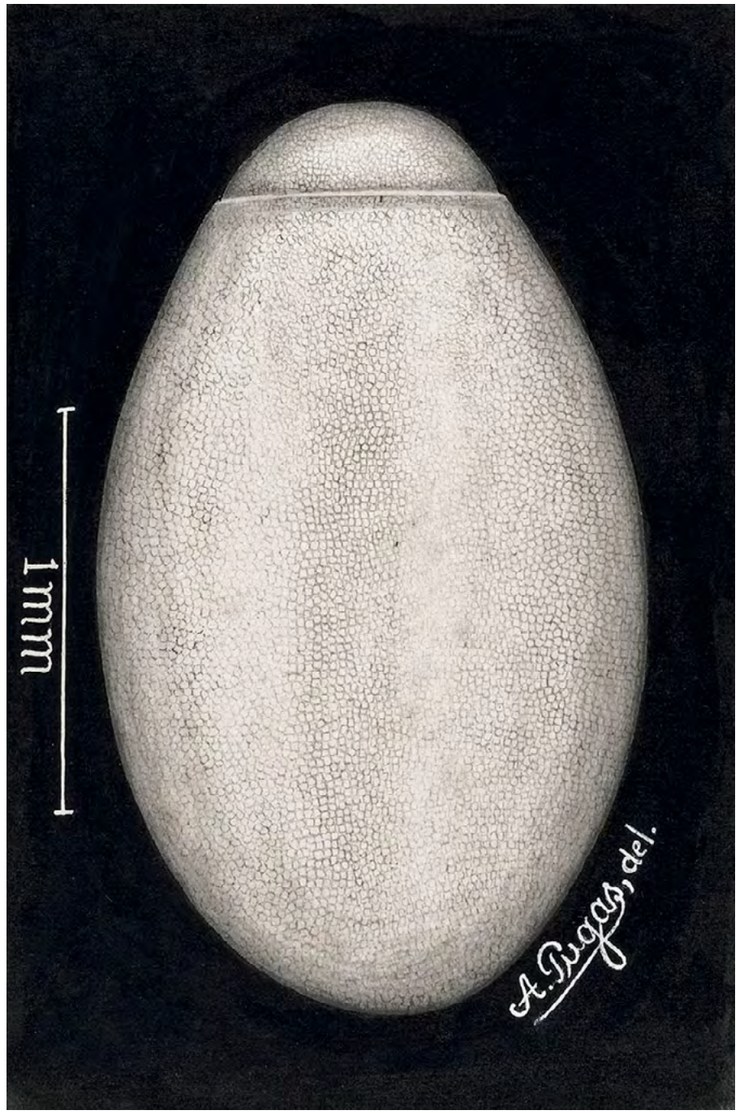
Dorsal view of male *Panstrongylus tupynambai* Lent, 1942 (kissing bug), vector of Chagas disease
N.d.
India ink and watercolor; 25cm x 17.5cm



Lateral view of Phlebotominae pupa
N.d.
India ink; 35.5cm x 16cm

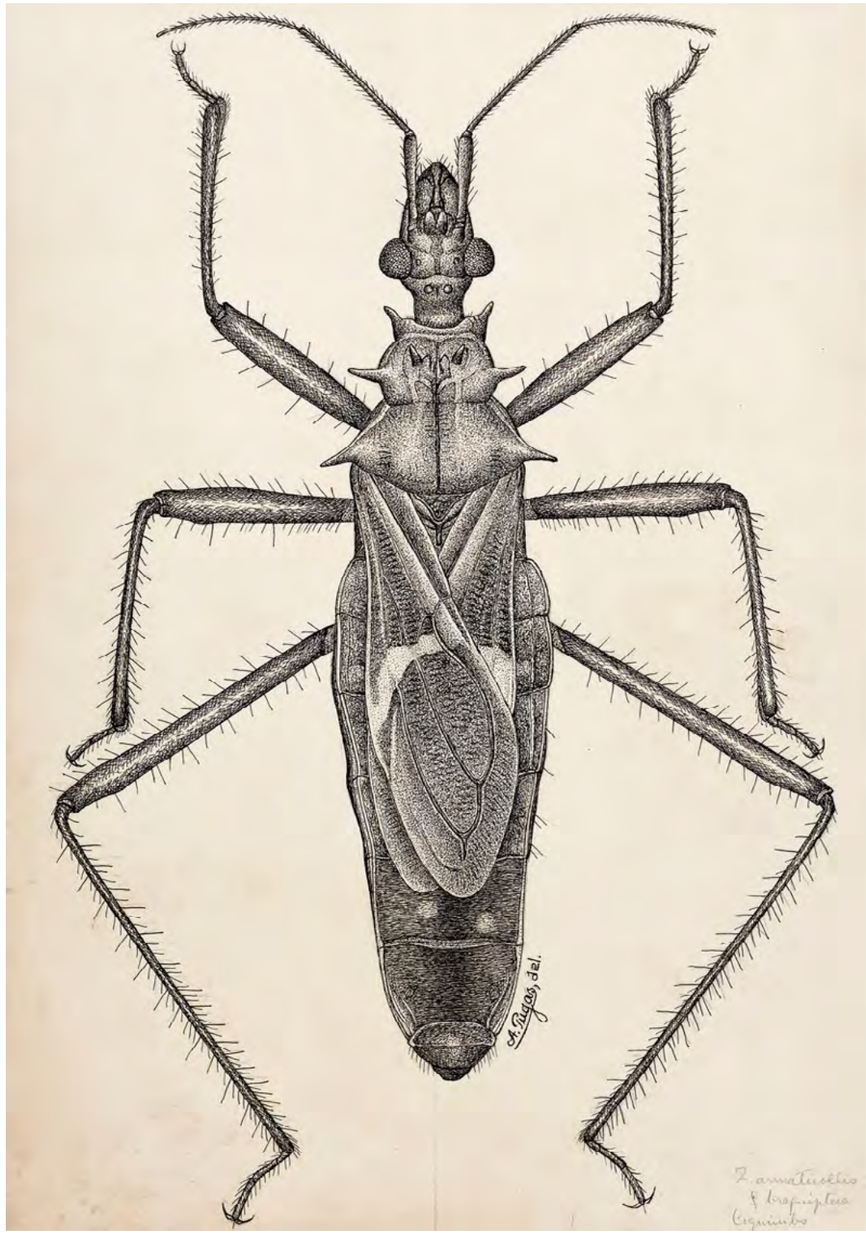
Dorsal view of female *Microtomus conspicillaris* (Drury, 1782)
N.d.
India ink; 51cm x 36.5cm

Dorsal view of female *Triatoma infestans* (Klug, 1834)
N.d.
Watercolor; 39cm x 30cm



Lateral view of egg of *Triatoma vitticeps* (Stål, 1859) (kissing bug), vector of Chagas disease.
Material donated by the researcher Emmanuel Dias
N.d.
India ink (diluted); 16cm x 13.5cm

Dorsal view of male *Sirthenea amazona* Stål, 1866
N.d.
India ink; 51cm x 36.5cm

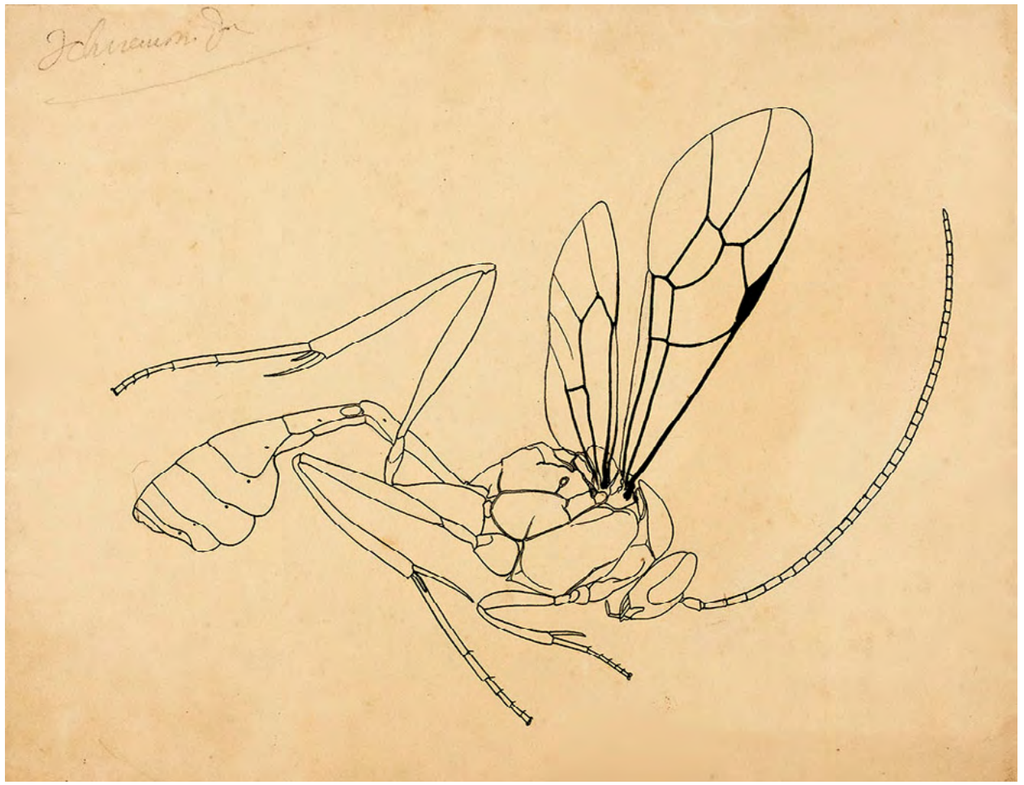


Dorsal view of female *Zelurus armaticollis* (Blanchard, 1852)
N.d.
India ink; 36cm x 26.5cm

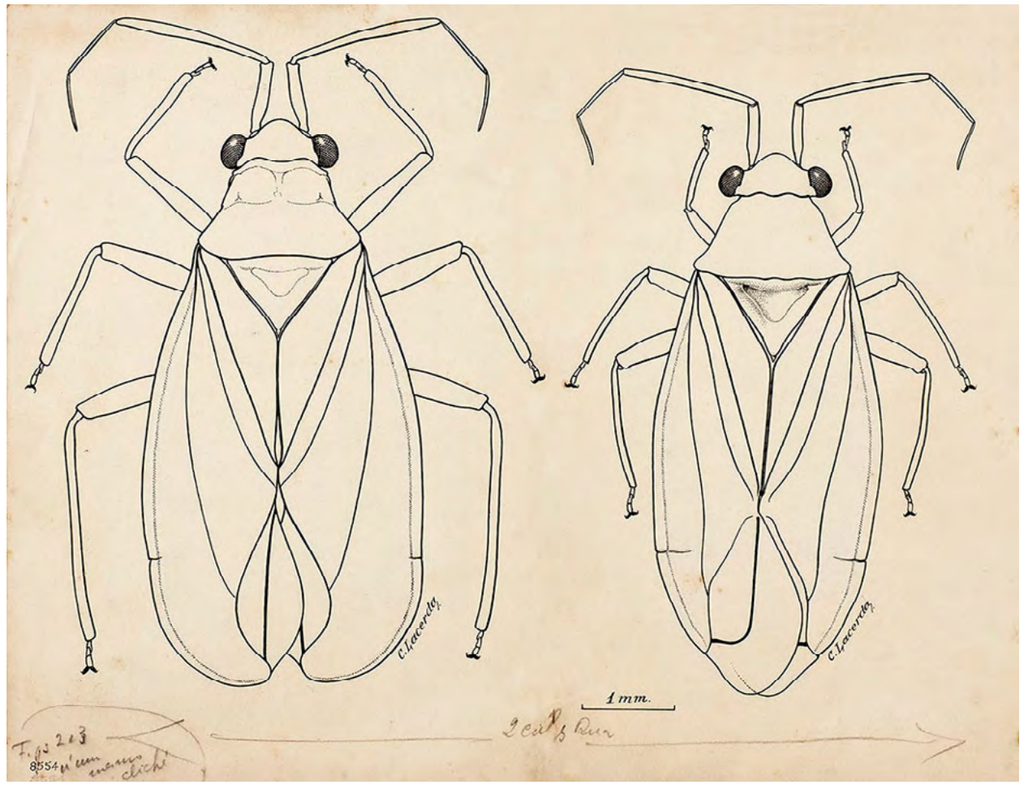
CARLOS LEAL LACERDA

Carlos Leal Lacerda was born on June 22, 1906, in Rio de Janeiro. He joined the staff at the Biological Institute of Agricultural Defense in 1924 as a rural worker; from 1930 onwards he worked as a sketch artist aide. That same year, he joined the staff at the Oil Institute as a photographic artist. From 1933 to 1939 he held this same post at the Institute of Plant Biology, which was part of the Agriculture Ministry's Directorate for Scientific Research, then headed by Angelo Moreira da Costa Lima. Among his activities of special note during this period, Lacerda provided services to the Phytopathologists of Brazil, a group of researchers with ties to the Botanical Gardens of Rio de Janeiro, and also collected earth samples for studies he was leading at the Itatiaia Biological Station, where he continued his activities in art and photomicrography. In 1939 he transferred to the National School of Agronomy and was assigned to produce sketches and photographs for *Insetos do Brasil*, by Costa Lima. He remained there until 1961, when this 12-volume work was finished. His long, rewarding partnership with Costa Lima was not limited to *Insetos do Brasil*; he had begun signing similar works for the researcher in the early 1930s. He retired as an employee of the Ministry of Agriculture in 1956.

Dorsal view of female *Telenomus fariai* Lima, 1927, a microhymenopteran parasite that feeds on *eggs* of *Triatominae* (kissing bugs)
N.d.
India ink; 20.5cm x 14cm



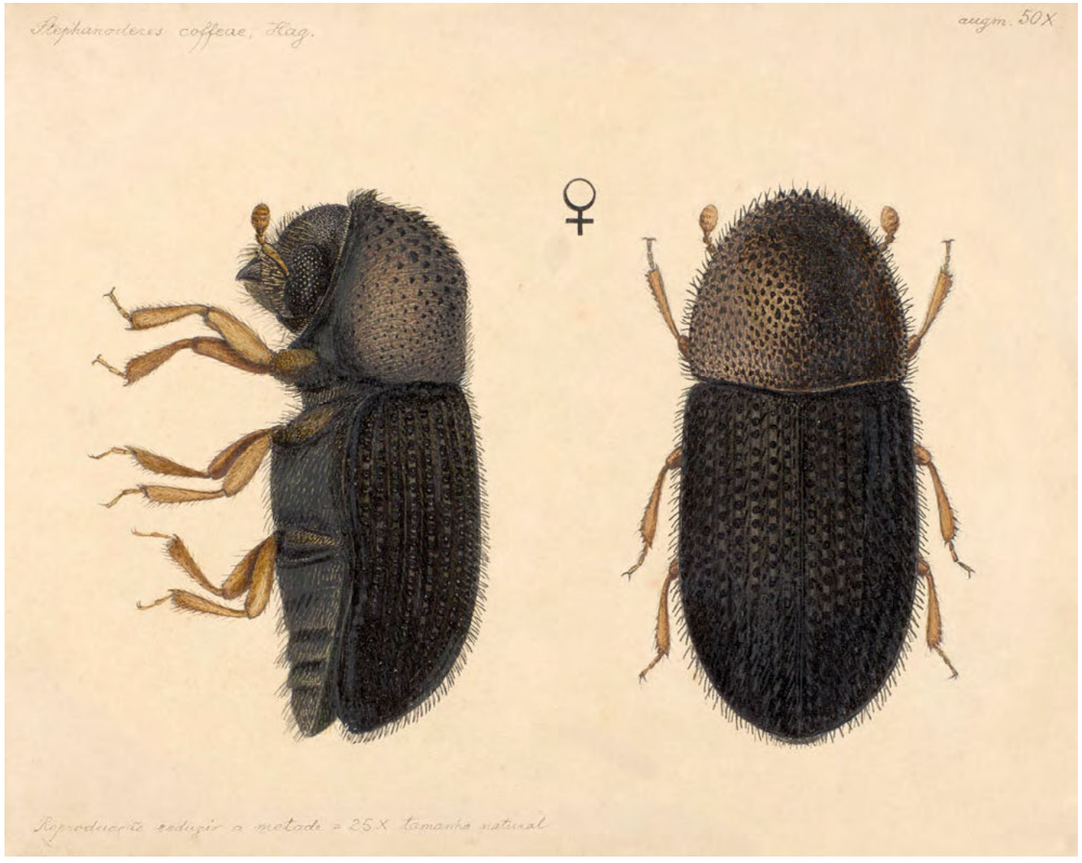
Lateral view of female *Angitia (Inareolata) brasiliensis* Costa Lima, 1935, a parasite that feeds on butterflies of the sub-species *Papilio anchisiades capys* (Hübner, 1809). Specimen collected on a *Citrus aurantium* (orange) in the Forest Garden, Rio de Janeiro
1933-1935
India ink; 26cm x 21cm



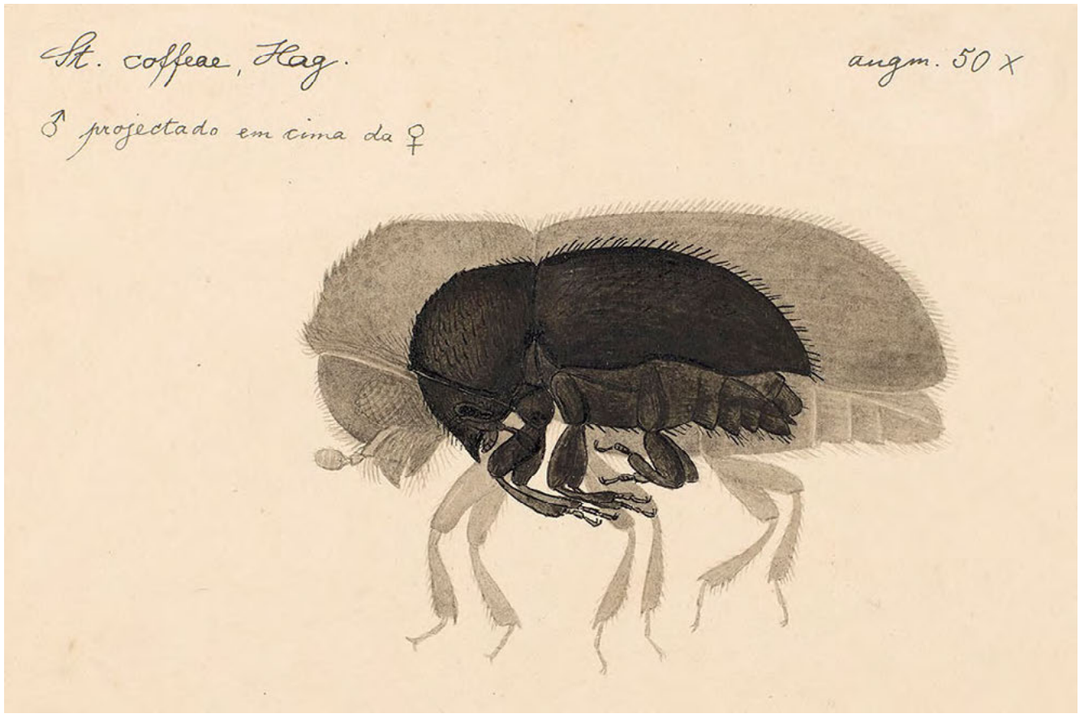
Dorsal views of male and female *Neoneella zikani* Costa Lima, 1942 (orchid bug)
1942
India ink; 33cm x 25.5cm

CARLOS RUDOLF FISCHER

Carlos Rudolf Fischer was born on September 17, 1886, in Leipzig, Germany. At the invitation of Oswaldo Cruz, he moved to Rio de Janeiro to be a sketch artist at the IOC, where he stayed from 1912 to 1916. There he initiated his partnership with Adolpho Lutz, for whom he was an important illustrator. Even after he left the institute, he still did sketches for its researchers. He moved to São Paulo in the late 1910s, working first at the Butantan Institute. He illustrated science communication publications for the Campaign against the Coffee Borer, conducted by the Commission to Study and Overcome the Coffee Borer (1924-1927), under the leadership of Arthur Neiva. He was also part of the first team at the Biological Institute of Agricultural and Animal Defense, a research institution founded in 1927 by the São Paulo state government and likewise headed by Arthur Neiva. He stayed at the institute for twenty years, first as a microscopic sketch artist and later as a writer and editor. He also studied insects and described new species, and was especially interested in their metamorphosis, systematics, and geographic distribution. He died on May 25, 1955, in the city of São Paulo.

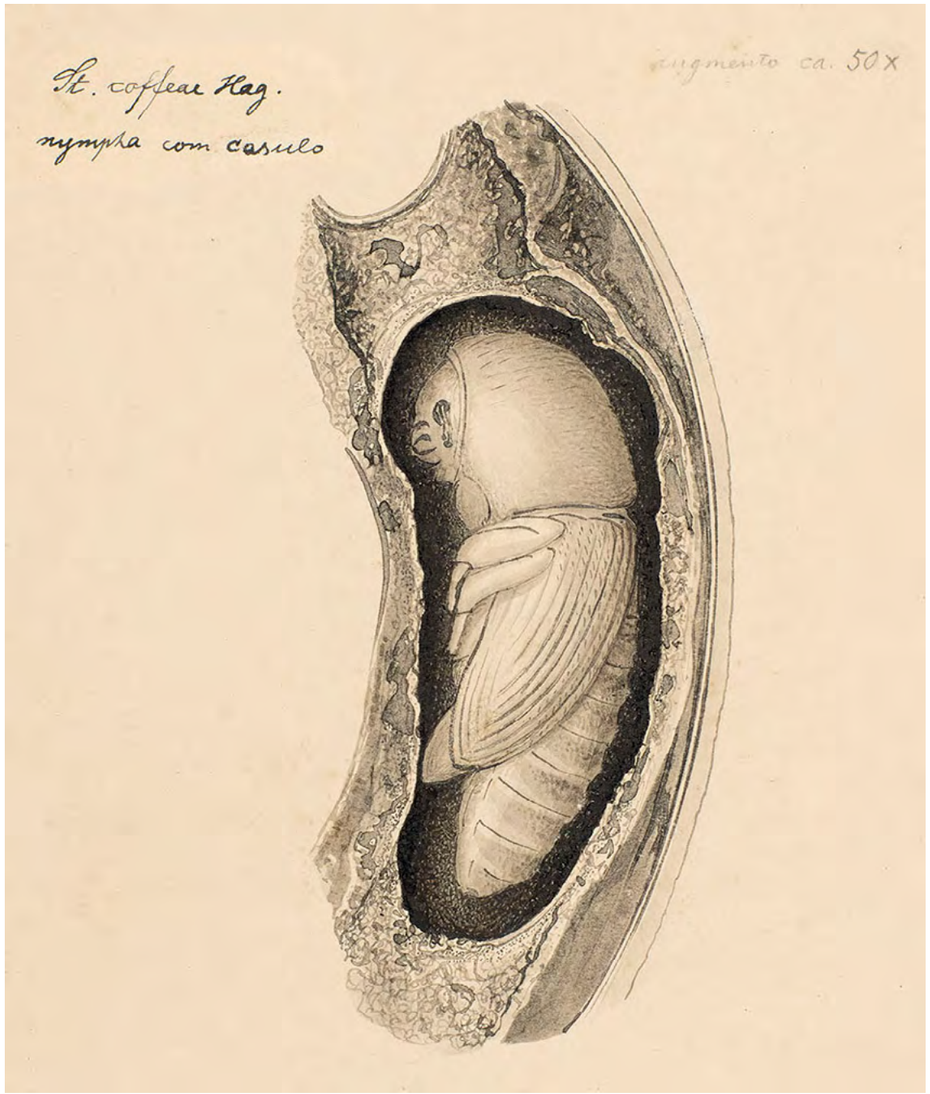


Lateral and dorsal views of female *Stephanoderes coffeae,* now *Hypothenemus hampei* (Ferrari, 1867). Promotional material used in the fight against the coffee borer in São Paulo
1926
India ink and pastel; 21cm x 16.5cm



Lateral view of male *Stephanoderes coffeae,* now *Hypothenemus hampei* (Ferrari, 1867), projected over female. Promotional material used in the fight against the coffee borer in São Paulo
1926
India ink; 19cm x 15.5cm

CARLOS RUDOLF FISCHER

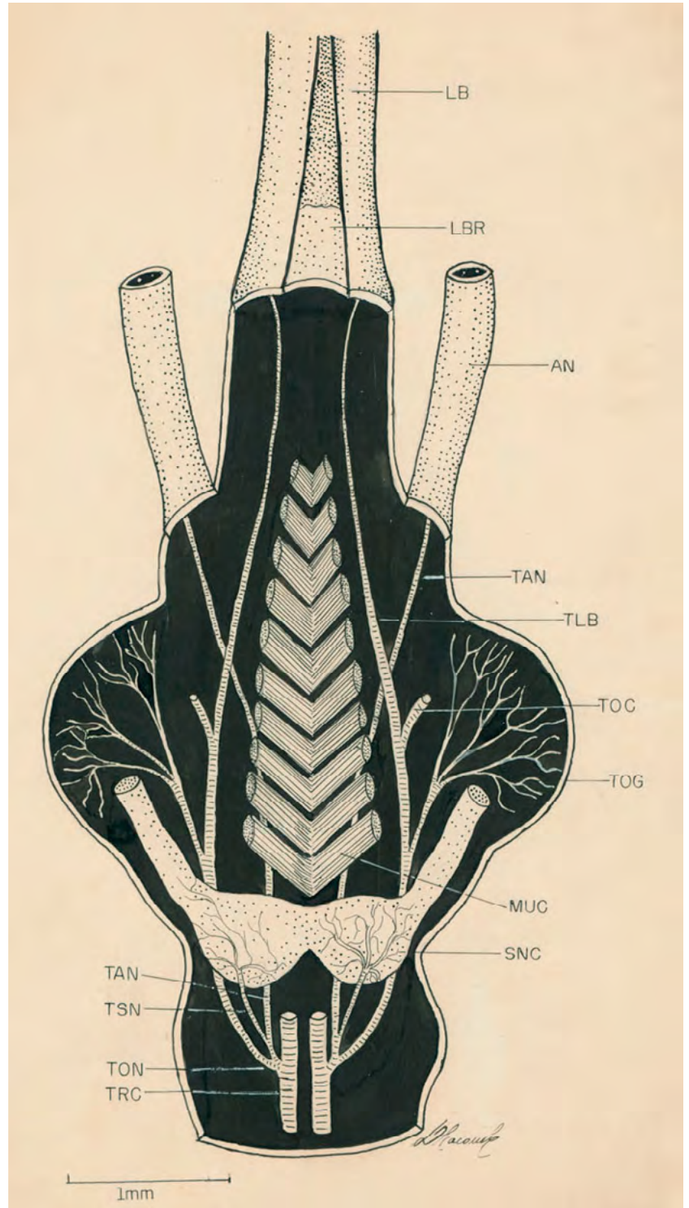


Lateral view of pupa of *Stephanoderes coffeae,* now *Hypothenemus hampei* (Ferrari, 1867). Promotional material used in the fight against the coffee borer in São Paulo
1926
India ink; 20cm x 16cm

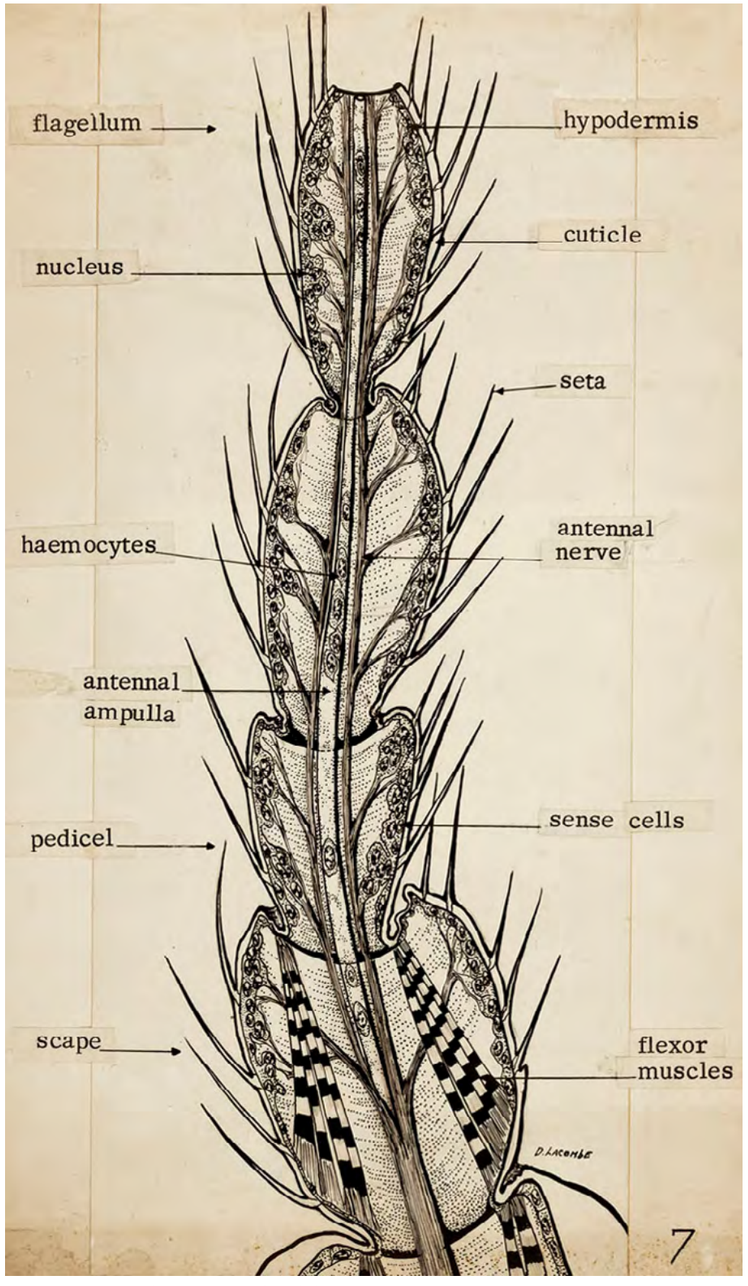
DYRCE LACOMBE DE ALMEIDA

Dyrce Lacombe was born on March 16, 1932, in Rio de Janeiro. In 1955, she received her undergraduate degree in natural history from the National School of Philosophy (FNFi), then part of the University of Brazil. While in college, she served as Olympio da Fonseca Filho's assistant at the FNFi and took an extension course in zoology taught by Newton Dias dos Santos, who was with the National Museum. In 1952 she took the IOC course in general entomology under Rudolf Barth, thus inaugurating her fruitful research career alongside the scientist. While an IOC fellow, she studied the anatomy and histology of insects, especially barber bugs. Over the years, she was heavily involved in teaching activities at the FNFi, the University of the Federal District, the Ministry of Education, and the IOC. In 1957 she passed a public qualifying exam and began working as a zoologist at the National Museum. She left the museum in 1960 to join the IOC, first as a National Research Council fellow and later as a biologist and researcher. That same year, she turned to researching crustaceans, especially barnacles (*Cirripedia*), and also began compiling a histological, taxonomic collection of the same. In 1967 the Osborn Laboratories of Marine Science, in New York, invited her to study barnacles and in 1969 she collaborated with the California Academy of Sciences on a monograph about insects of the order Embioptera. She retired in 1991 but continued doing research at the IOC, focusing on barnacles, Embioptera, and the histology of kissing bugs.

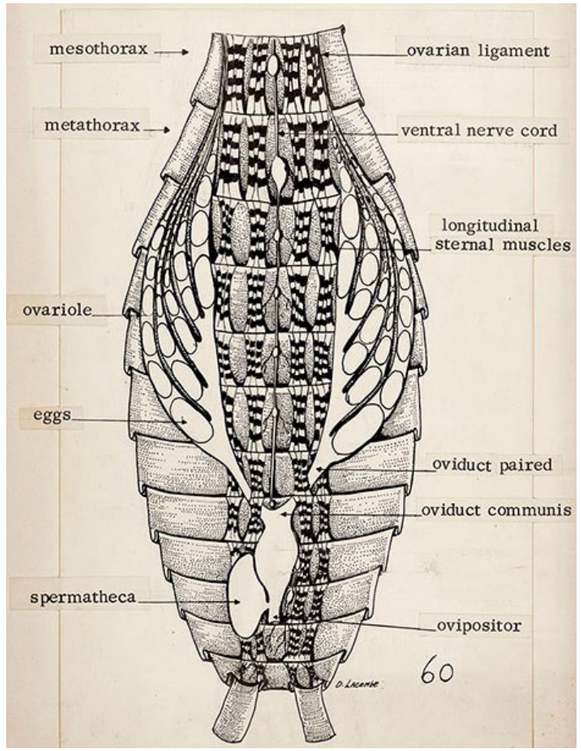
D. LACOMBE

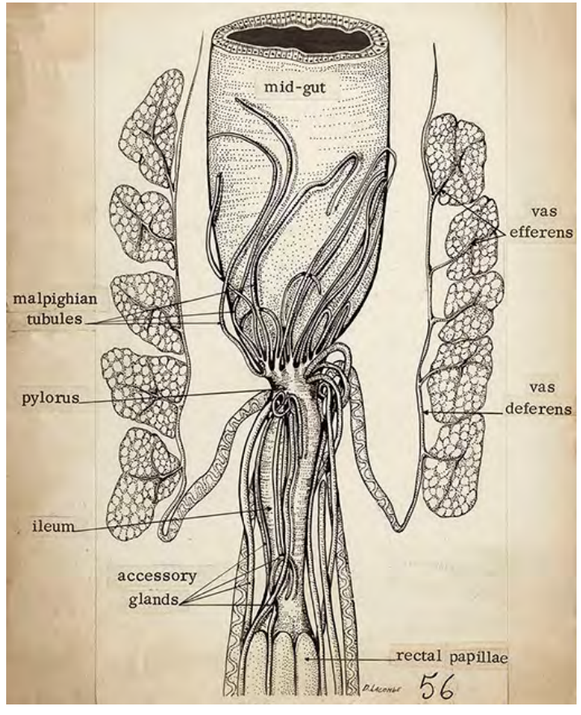


Distribution of tracheas in the head of *Panstrongylus megistus* (Burmeister, 1835); dorsal view
1960s
India ink; 29cm x 19cm



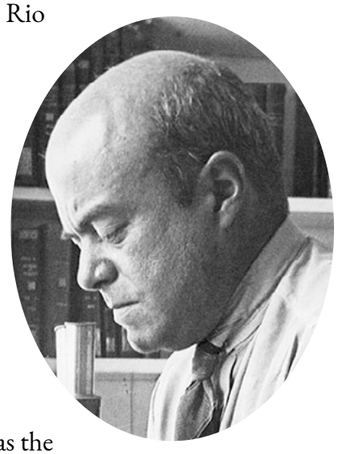
Internal anatomy of the antenna of *Embolyntha batesi* Maclachlan, 1877
1970s
India ink; 42cm x 28cm



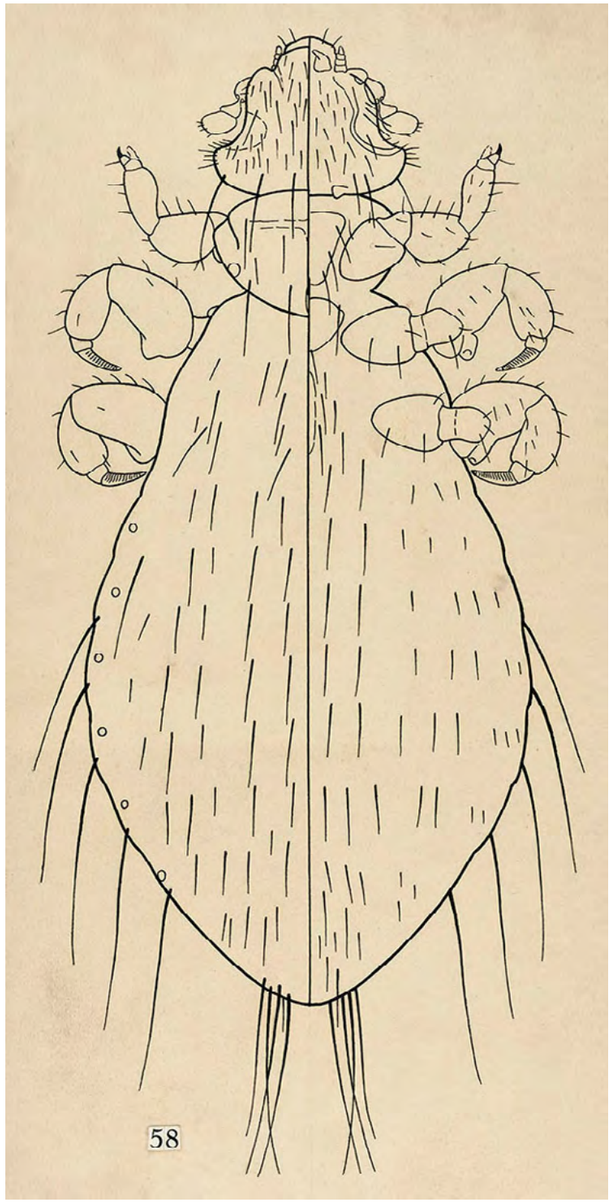


Embolyntha batesi
Maclachlan, 1877; internal anatomy of male and female reproductive tract
1970s
India ink; 39cm x 28cm and 36cm x 28cm

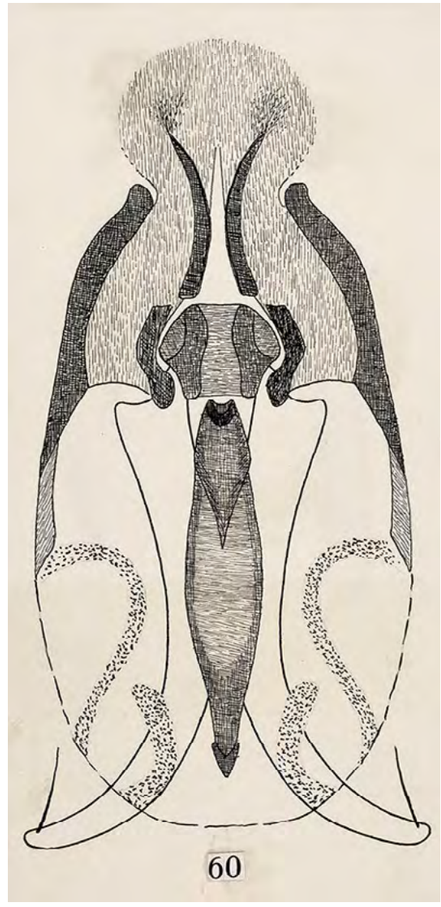
FÁBIO LEONI WERNECK



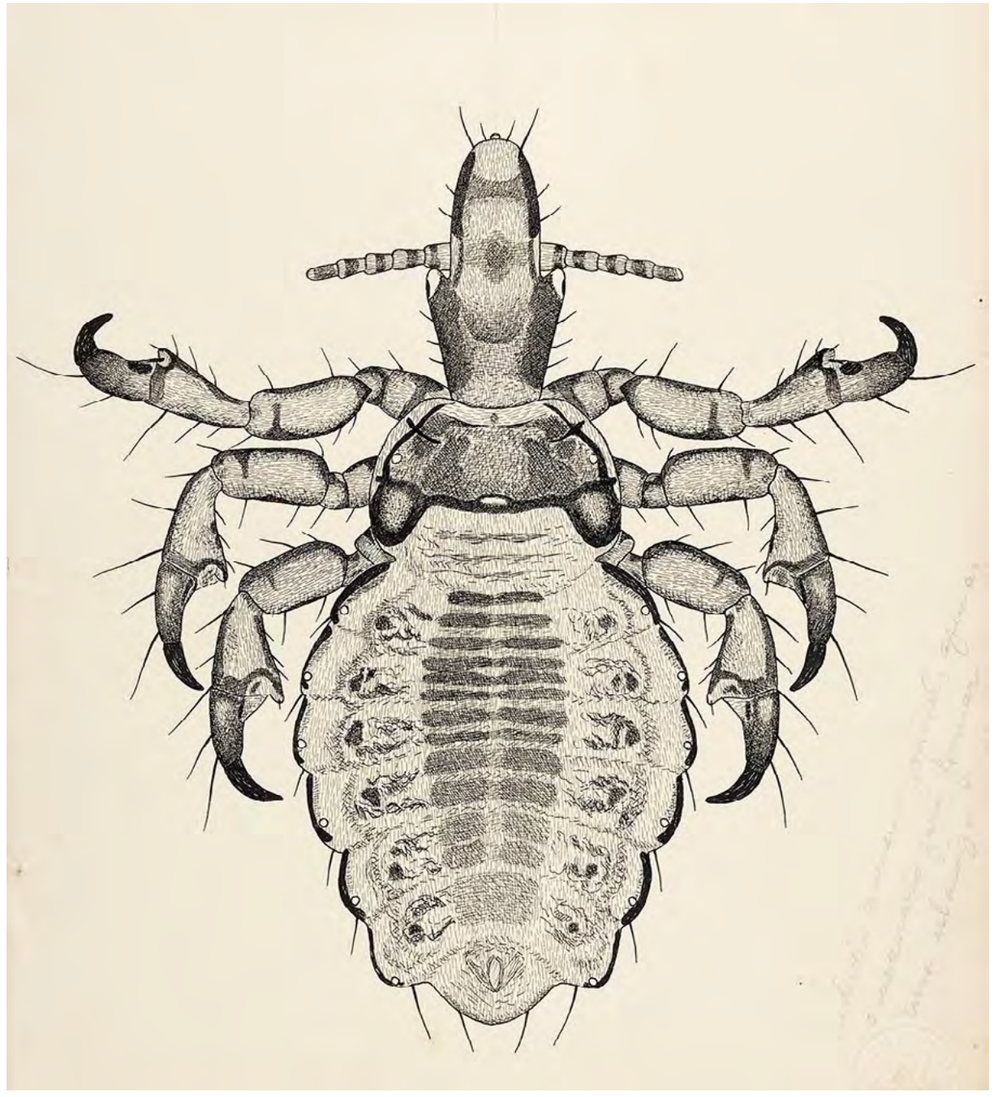
Fábio Werneck was born on August 13, 1891, in Rio de Janeiro. He received his medical degree from the Rio de Janeiro Faculty of Medicine in 1919 and a degree in pharmacy from the Faculty of Pharmacy and Dentistry of the State of Rio de Janeiro in 1920. While in school, he interned at the Faculty's zoology, parasitology, and histology laboratories, at the mineral and analytical chemistry laboratories of the Polytechnic School, and at the analytical chemistry laboratory of the Geological and Mineralogical Service. From 1919 to 1931, he was the pharmacist and technical director at Laboratório Werneck, a family business. In 1930, he began volunteering at the IOC Entomology Laboratory, then headed by Angelo Moreira da Costa Lima. In 1931-1932 he completed the Specialization Course there and was named adjunct laboratory head in 1933; he was promoted to laboratory head in 1936 and to researcher in 1951. He went on a number of scientific excursions into rural Brazil to collect sucking (Anoplura) and biting (Mallophaga) lice, his specialty. In 1943 he received a fellowship from the John Simon Guggenheim Memorial Foundation to spend time at Stanford University and in 1953 Brazil's National Research Council awarded him another to collect scientific material in Africa and visit lice collections at European museums. Over the course of his career, he maintained a steady scientific correspondence with area researchers in Brazil and abroad, including Lindolpho Rocha Guimarães, Theresa Clay, George Henry Evans Hopkins, and Gordon Floyd Ferris. He died on February 19, 1961, in Rio de Janeiro.



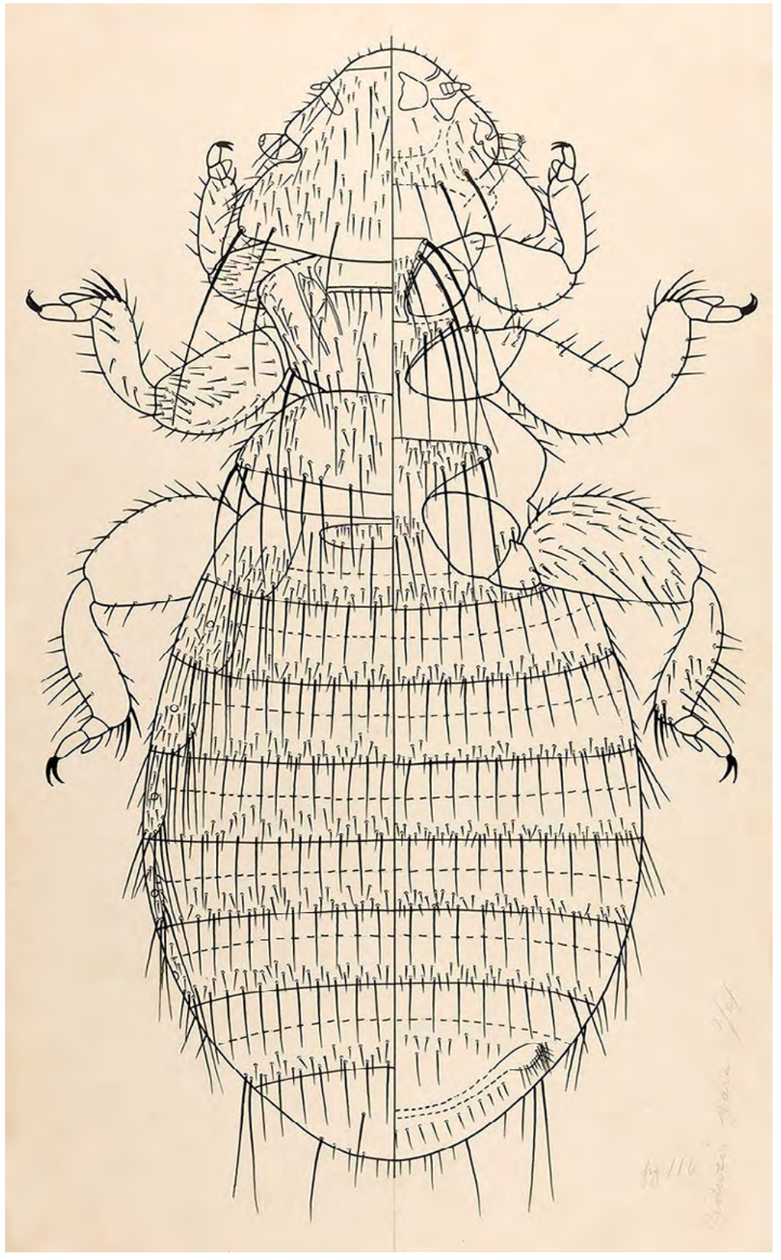
Ventral and dorsal views of male *Gyropus limai* Werneck, 1948, captured on a rodent in the Capela de São Braz Forest, Santa Teresa, Espírito Santo. Species named in honor of Angelo Moreira da Costa Lima
1948
India ink; 36.5cm x 22cm



Gyropus limai Werneck, 1948; dorsal aspect of male copulatory apparatus
1948
India ink; 21.5cm x 22.5cm



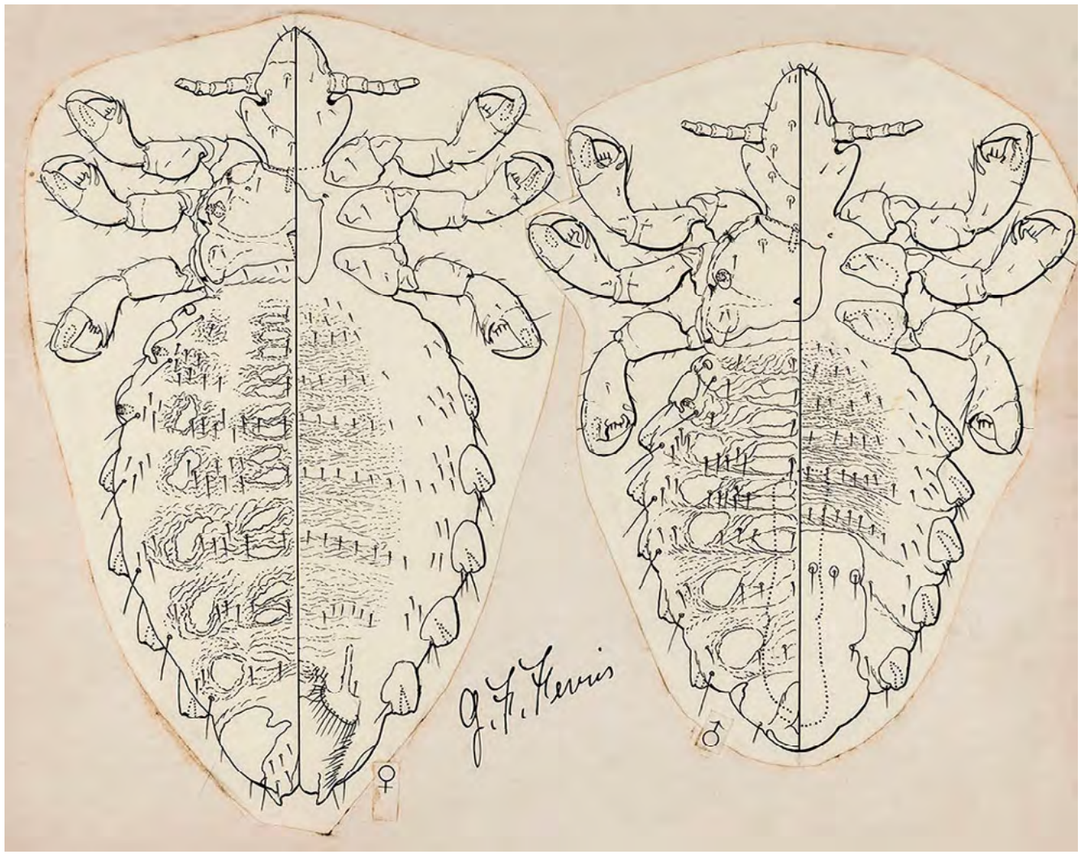
Dorsal aspect of male *Haematopinus suis* (Linnaeus, 1758), lice of the domestic pig. Unmounted specimen
N.d.
India ink; 26.5cm x 22.5cm



Dorsal and ventral views of female *Philandesia townsendi* Kellogg & Nakayama, 1914, a parasitic lice that feeds on the *viscacha*, small South American rodents
N.d.
India ink; 52 cm x 31 cm

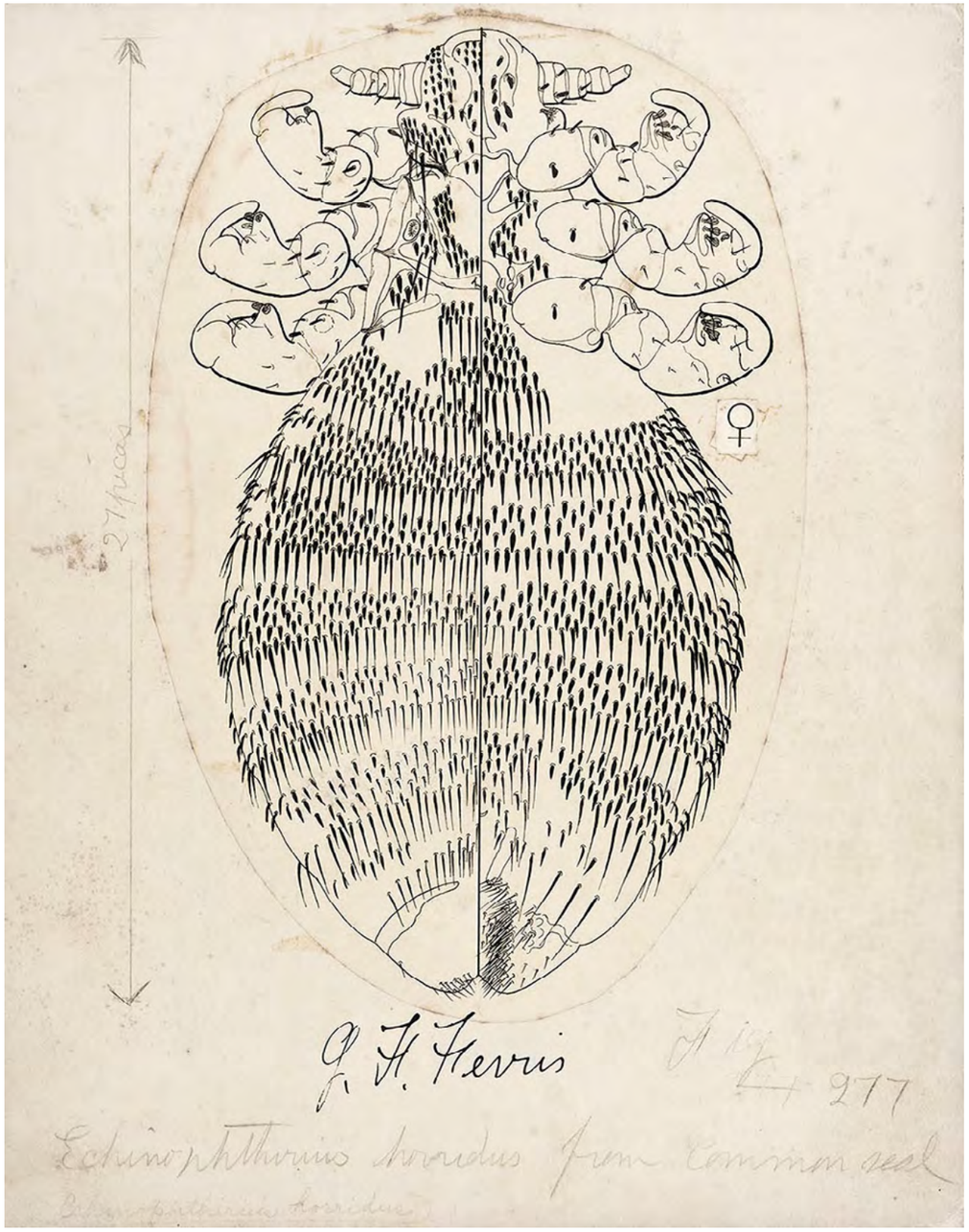
GORDON FLOYD FERRIS

Gordon Floyd Ferris was born in Bayard, Kansas, on January 2, 1893. In 1909 he enrolled at Ottawa University, in Kansas, but soon dropped out to take a job at an electric company. Since the company paid for its employees' education, in 1912 he went to study at Stanford University. He received his master's degree in 1917, became an assistant professor, and spent his 42-year academic career there. As a taxonomist, he researched Anoplura, Mallophaga, Diptera, Coccoidea, Cimicidae, and Polyctenidae and traveled throughout the U.S. Southwest and into Mexico, China, and England, studying and collecting insects. His 275 published works include the noteworthy seven-volume *Atlas of the Scale Insects of North America* (1937-1955). He established many *new taxa, including the genus Werneckia (*1951), *named in honor of IOC researcher* Fábio Werneck. He died on May 21, 1958, in California.



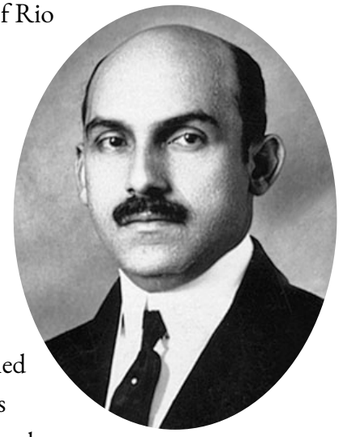
Dorsal and ventral views of male and female *Haematopinus eurysternus* (Nitzsch, 1818), parasitic louse of domestic animals
1933
India ink; 28,5cm x 23cm

GORDON FLOYD FERRIS



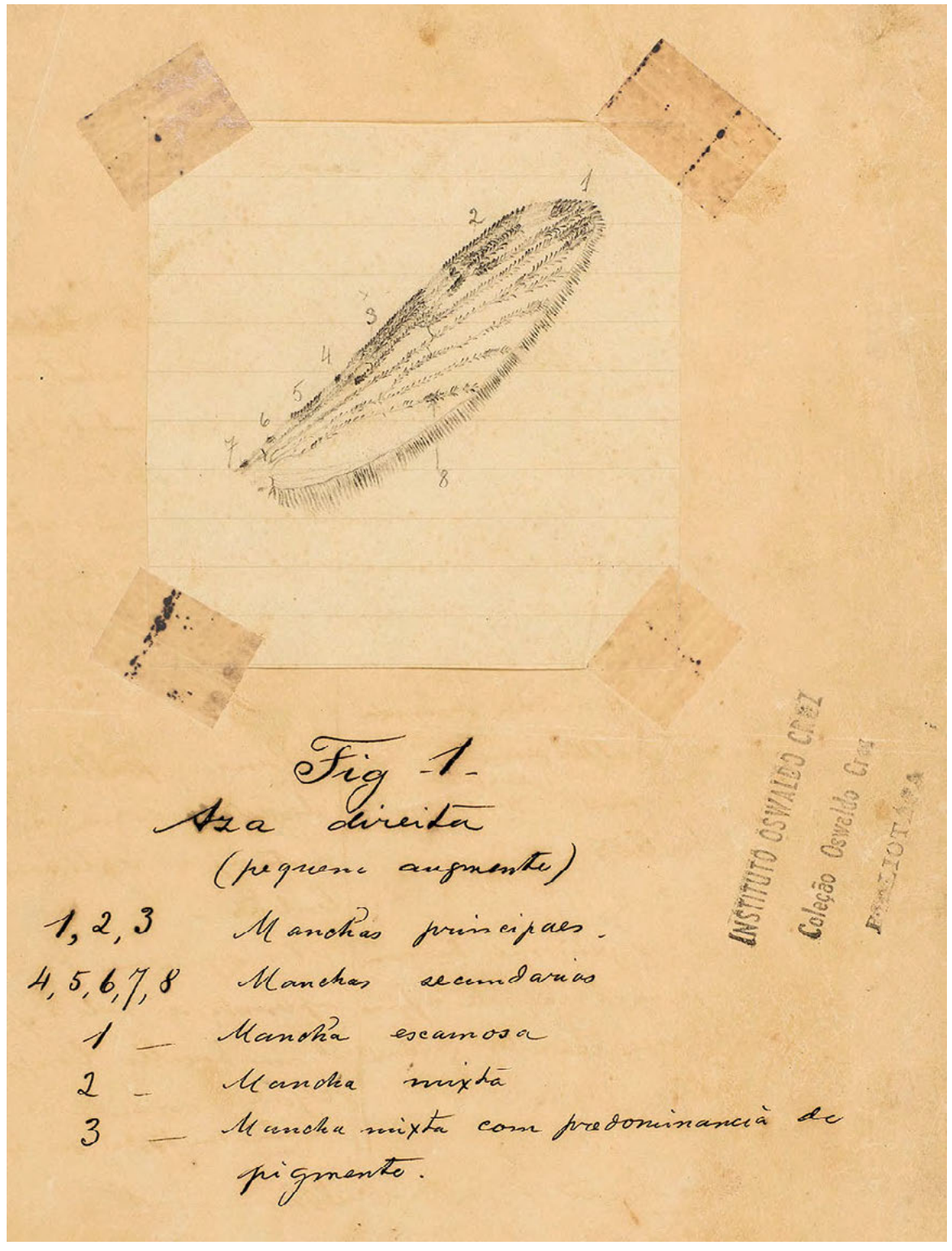
Dorsal and ventral views of female *Echinophthirus horridus* (Olfers, 1816), a parasitic louse that feeds on *Phoca vitulina*
1934
India ink; 28.5cm x 23cm

HENRIQUE DA ROCHA LIMA

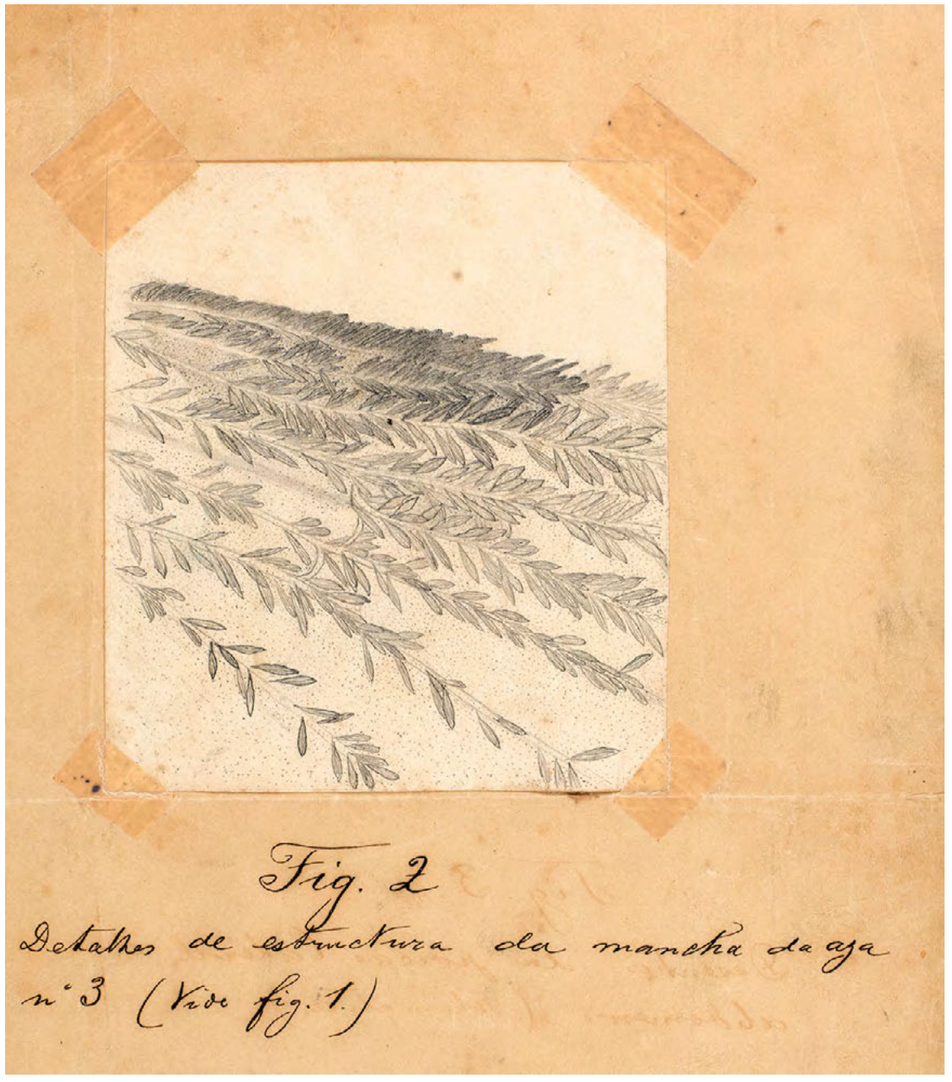


Henrique da Rocha Lima was born in the city of Rio de Janeiro on November 24, 1879. In 1901, he graduated from the Rio de Janeiro Faculty of Medicine. His first contact with Oswaldo Cruz and with scientific research had come one year earlier, when he spent time at the Federal Serum Therapy Institute, in Manguinhos. From 1901 to 1902, he studied at the Hygiene Institute and Charité Hospital in Berlin. In 1903, at the invitation of Oswaldo Cruz, he joined the Federal Serum Therapy Institute as a services coordinator. There, he played a significant role both in advising the medical students who did their thesis research at the institute's laboratories and also in setting up courses on anatomic pathology, bacteriology, and medical zoology. In 1906 he returned to Germany to study at the Institute of Pathology, attached to the University Hospital of Munich. Three years later, he joined the Institute of Pathology at Jena University. Later, he transferred to the Institute for Maritime and Tropical Diseases in Hamburg, where he stayed until 1927. While there, he researched several diseases, such as louse-borne typhus, whose etiological agent, *Rickettsia prowazekii*, he described. In 1928, after returning to Brazil, he joined the Biological Institute of Agricultural and Animal Defense (now the Biology Institute), where he served as director from 1933 to 1949. The greatest legacy of his administration was to firmly establish the São Paulo institute as a major scientific center both in Brazil and abroad. In 1952 the University of Hamburg awarded him an honorary doctorate. He died in the city of São Paulo on April 12, 1956. Four years earlier, in a statement about Oswaldo Cruz, he recalled the very first work of his career, which he had done at Manguinhos:

> Initially, microscopic examinations of the blood and its parasites were performed in the search for the insects that transmitted the latter. It was then that I made my first contribution to a scientific paper, but only as a drawing of the wing of a new mosquito discovered and described by Oswaldo Cruz (Rocha Lima, 1952, p.16).



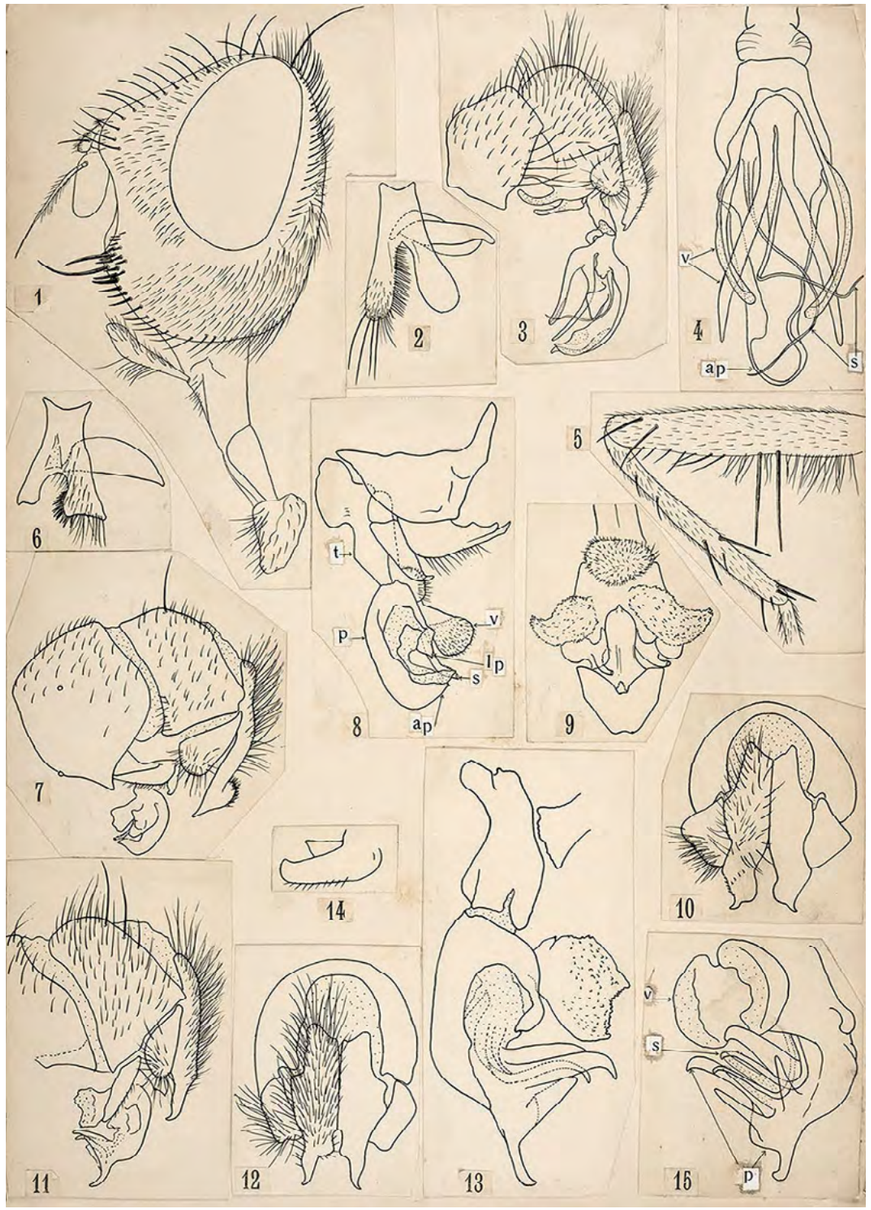
Anopheles lutzii Cruz, 1901; right wing
1901
Graphite pencil; 26.5cm x 20.5cm



Anopheles lutzii Cruz, 1901; details of wing structure
1901
Graphite pencil; 26.5cm x 16.5cm

HUGO DE SOUZA LOPES

Hugo de Souza Lopes was born on January, 5, 1909, in Rio de Janeiro. He earned his degree in veterinary medicine from the Higher School of Agricultural Science and Veterinary Medicine in 1933. In 1931, while still at school, he volunteered as an intern at Lauro Travassos's IOC laboratory, where he initiated his research on flies of the family Sarcophagidae. From 1932 to 1938 he was a technical aide with the Entomology Section at the Institute of Plant Biology, headed by Friar Thomaz Borgmeier. In 1938 he returned to the IOC, where he held the posts of researcher with the Helminthology Section (as of 1949) and head of the Entomology Section (1960-1964). In addition to doing research, he taught medical zoology, parasitology, and entomology at his alma mater (1934-1964), as well as with the IOC Specialization Course (1950-1968) and the Public Health Course at the Gonçalo Muniz Foundation (1951). In 1970, under Institutional Acts 5 and 10 (AI-5 and AI-10), the military dictatorship took all civil and political rights away from him and nine other IOC researchers, forcing him into retirement – an episode that came to be known as the Manguinhos Massacre. He then began doing his research at the National Museum's entomology laboratory. In 1976 he joined the faculty at Santa Úrsula University. Amnesty was declared in 1979 and in 1986 he returned to Fiocruz, working at the IOC Department of Biology as a full researcher. His studies encompassed the fields of entomology, malacology, and botany. He compiled a substantial collection of species, mainly of insects; described many new genera and species; and released more than two hundred publications. He died on May 10, 1991, in Rio de Janeiro.

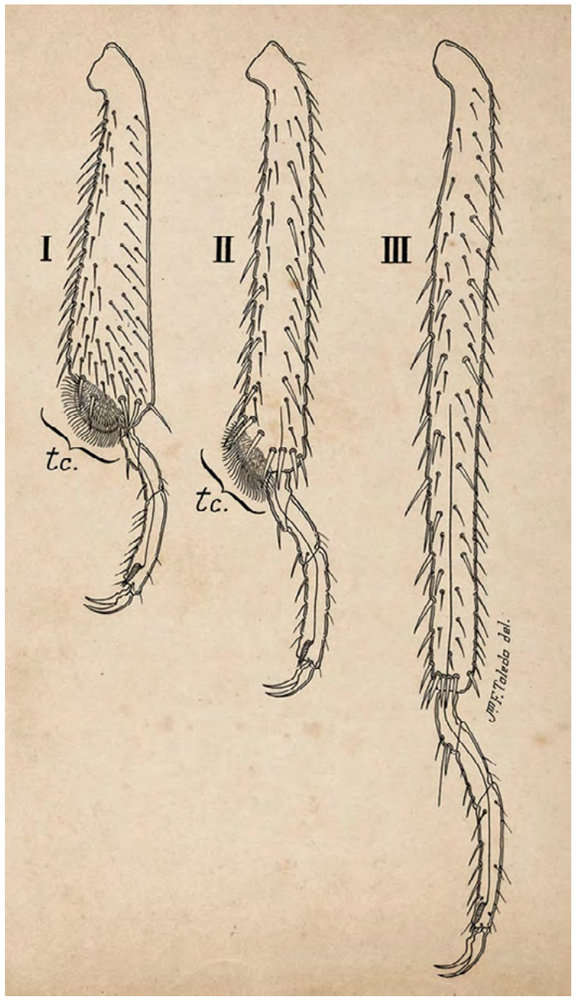


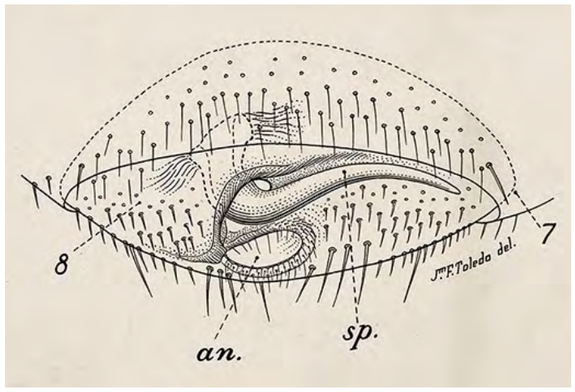
Structures of the head, sternite, genitalia, and leg of fly species of the family Sarcophagidae: *Hardyella littoralis,* now *Sarcophaga littoralis* Johnston & Tiegs 1922; *Bezziola kankauensis,* now *Sarcophaga crinita* Parker, 1917; *Bezziola versattilis,* now *Sarcophaga versatilis* (Lopes, 1959); and *Bezziola fabea,* now *Sarcophaga fabea* (Lopes, 1959)
1959
India ink; 50cm x 35cm

JOAQUIM FRANCO DE TOLEDO

Joaquim Franco de Toledo was born on January 31, 1905, in Piracicaba, São Paulo. He began his life as an artist when he was sixteen, drawing maps for a school census where he lived. In 1923 he moved to the city of São Paulo and in 1924 began working at the Botany Section of the Paulista Museum, where he drew illustrations for the institution's publications. Around the same time, he did sketches of reptiles of the group Ophidia for Afrânio do Amaral, who was with the Butantan Institute, and of marine insects and animals for Hermann Luederwaldt. He and Carlos Rudolf Fischer were members of the team of sketch artists who worked with the Commission to Study and Overcome the Coffee Borer (1924-1927), led by Arthur Neiva. These scientists drew up the advertising and public service announcements about the pest that was then assailing the São Paulo coffee crop. In 1927 he joined the staff at the Biological Institute of Agricultural and Animal Defense, an outgrowth of the same commission. He was also self-taught in botanical classification. In 1938, at the invitation of Frederico Carlos Hoehne, he took the post of head of the Scientific Service for Embryophytes, which was part of the Biological Institute's Botany Section; in 1942, he was named head of the Botany Institute's Phytotechnical Section. In addition to writing his own papers as a botanist, he did illustrations for many other researchers, including Lauro Travassos, César Ferreira Pinto, and Adolph Hempel. He died on May 17, 1952, in the city of São Paulo.

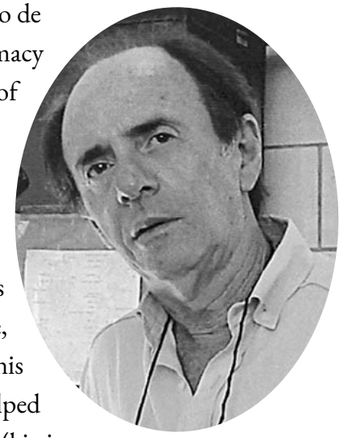
Lateral views of male and female pupae of *Stephanoderes coffeae,* now *Hypothenemus hampei* (Ferrari, 1867). Promotional material used in the fight against the coffee borer in São Paulo
1924-1927
India ink; 11.5cm x 11.5cm



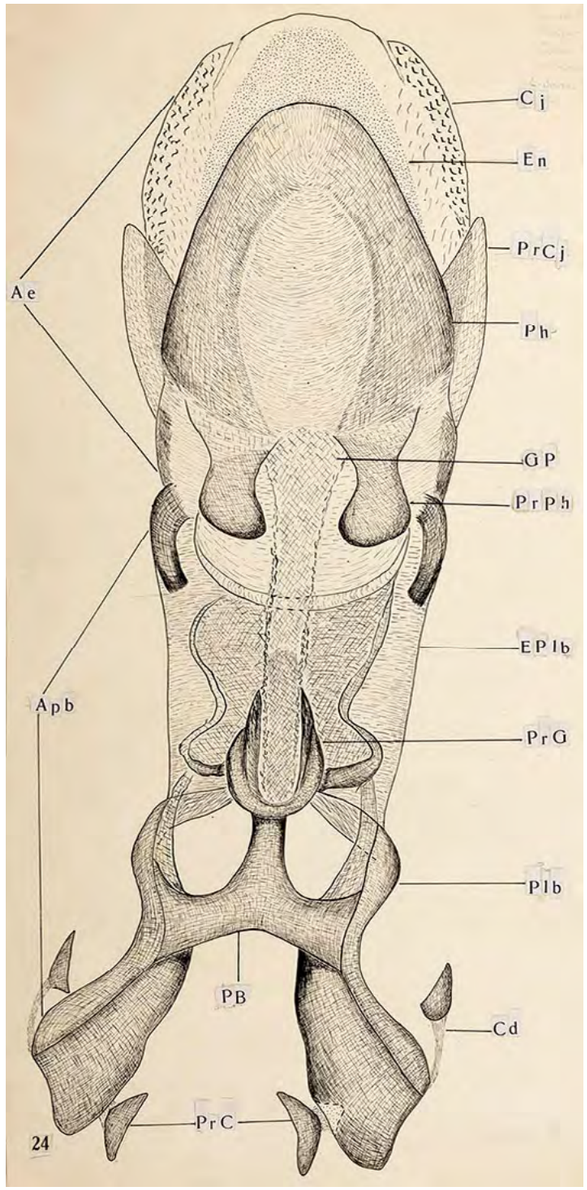


Ornithocoris toledoi Pinto, 1927; a parasitic insect that feeds on chickens. Tibia and tarsus of feet and genital segment of male
1930
India ink; 31cm x 20.5cm and 19cm x 14cm

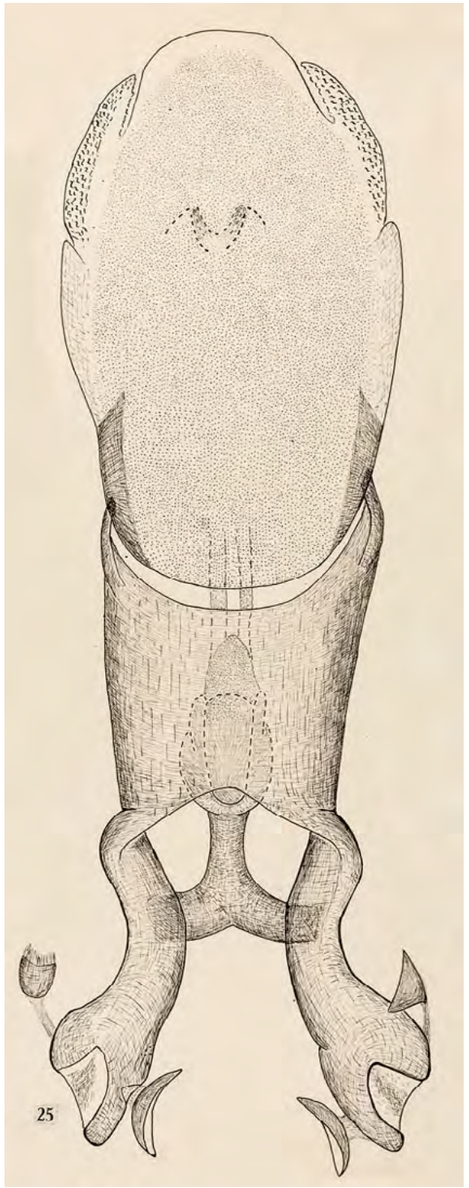
JOSÉ JURBERG



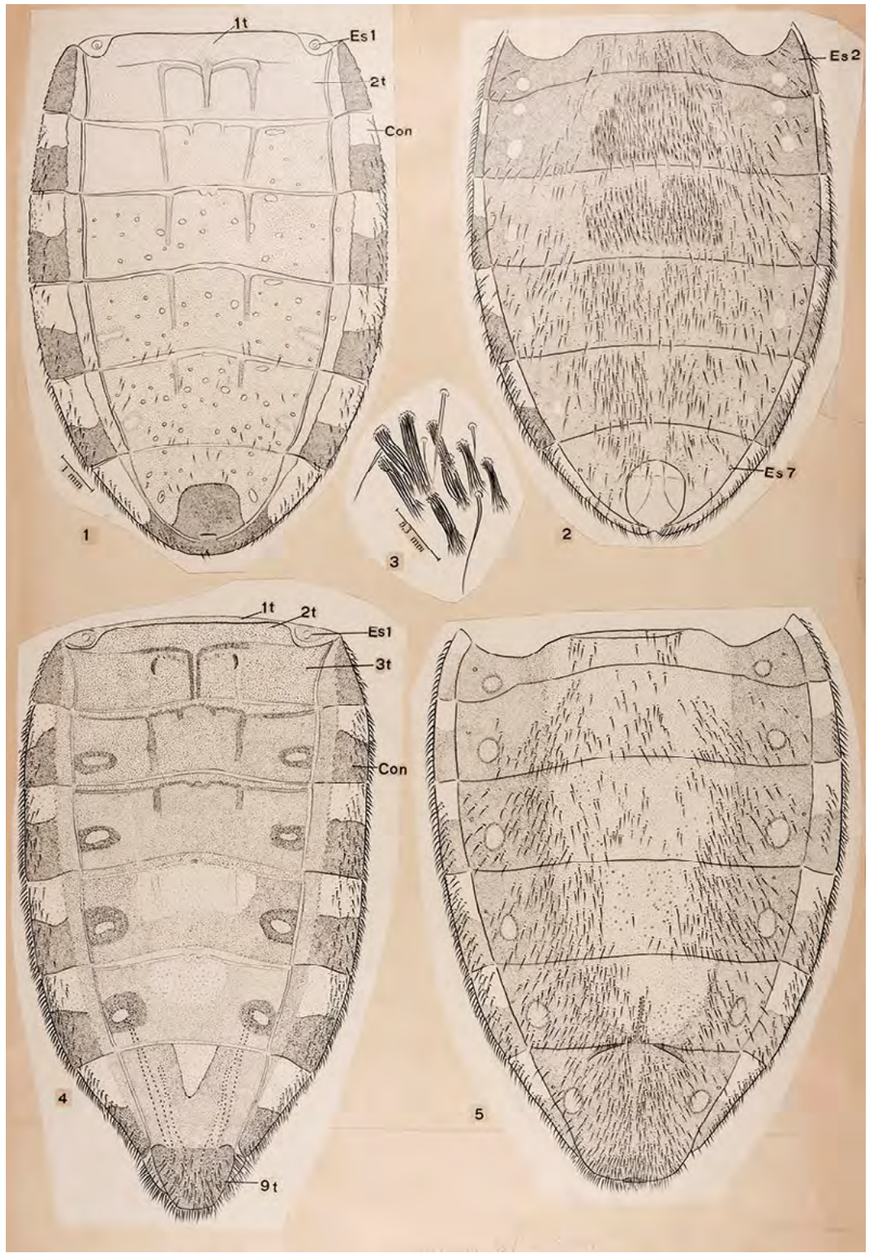
José Jurberg was born on July 24, 1936, in Rio de Janeiro. In 1960 he earned his degree in pharmacy from the Faculty of Pharmacy and Dentistry of the State of Rio de Janeiro, now Fluminense Federal University. That same year he began interning at the IOC's Entomology Section under the advisorship of Herman Lent and Hugo de Souza Lopes. Two years later, he was hired as an IOC researcher. That same decade, he taught hygiene and pharmaceutical law at his alma mater. Together with his advisors, he helped devise a new tool for identifying Triatominae (kissing bugs) and other groups of insects, using comparative analysis of their phallic structures and internal anatomy. It was around this time that it became evident he was skilled at scientific drawing; he also became noted for his productive exchange with science institutions at home and abroad. When the military government suspended the civil and political rights of ten IOC researchers in 1970 and forced them into retirement, under AI-5 and AI-10 – an episode known as the Manguinhos Massacre – he was put in charge of the Entomology Section and became a stalwart defender of its Entomological Collection. He pushed hard for the researchers' re-instatement, which finally came in 1986, when Fiocruz was headed by Sérgio Arouca, for whom Jurberg served as advisor on the Technical and Scientific Council. He received his master's degree in the biological sciences from the National Museum in 1978. In 1989 he established the National and International Reference Laboratory for the Taxonomy of Triatominae. He received his PhD in science from the Federal Rural University of Rio de Janeiro in 1996. From 1991 to 1997, he was head of the Entomology Department at the IOC. He retired in 2006 but stayed on as laboratory head and curator of the Triatominae Collection.



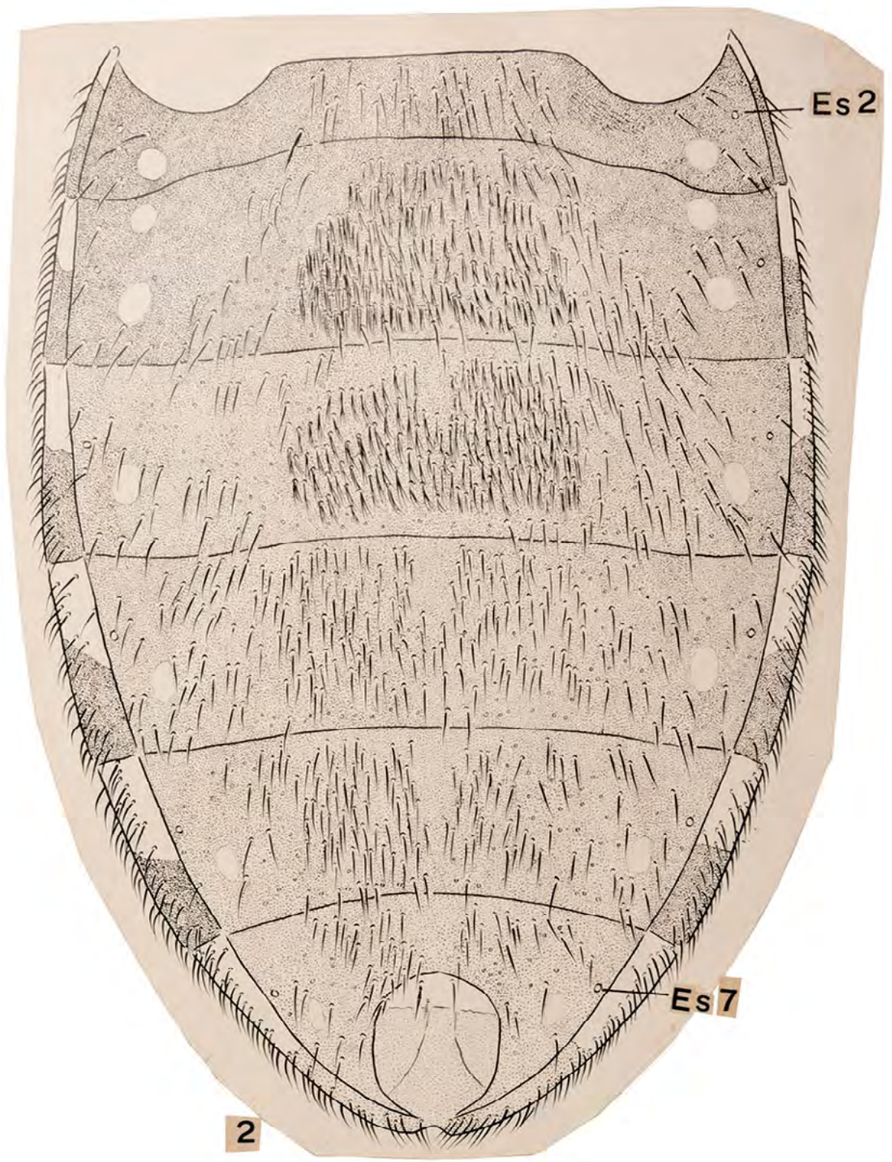
Dorsal view of male genitalia of *Psammolestes coreodes* Bergroth, 1911; extended *phallus*
1965
India ink; 52cm x 52cm



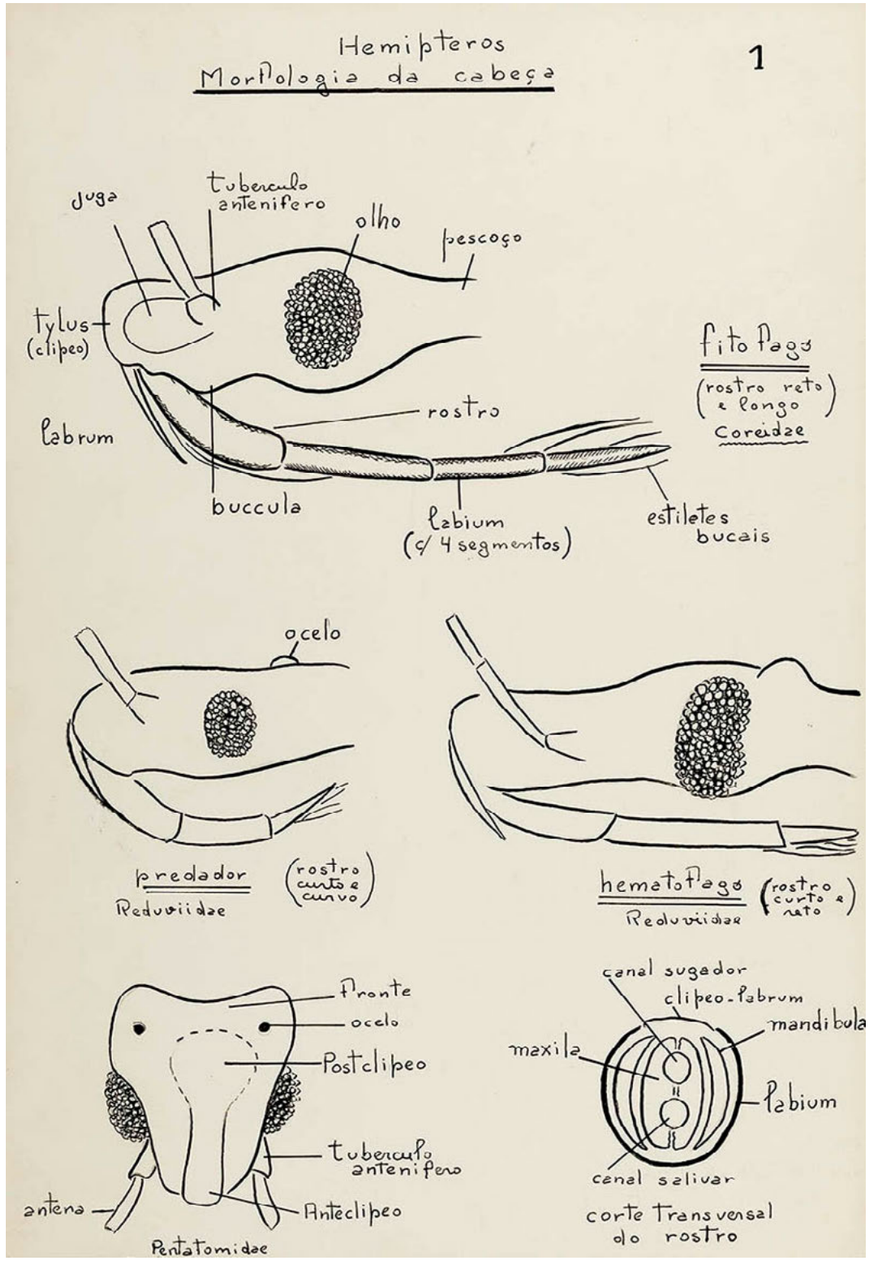
Dorsal view of male genitalia of *Psammolestes tertius* Lent & Jurberg, 1965; extended *phallus*
1965
India ink; 46.5cm x 20.5cm



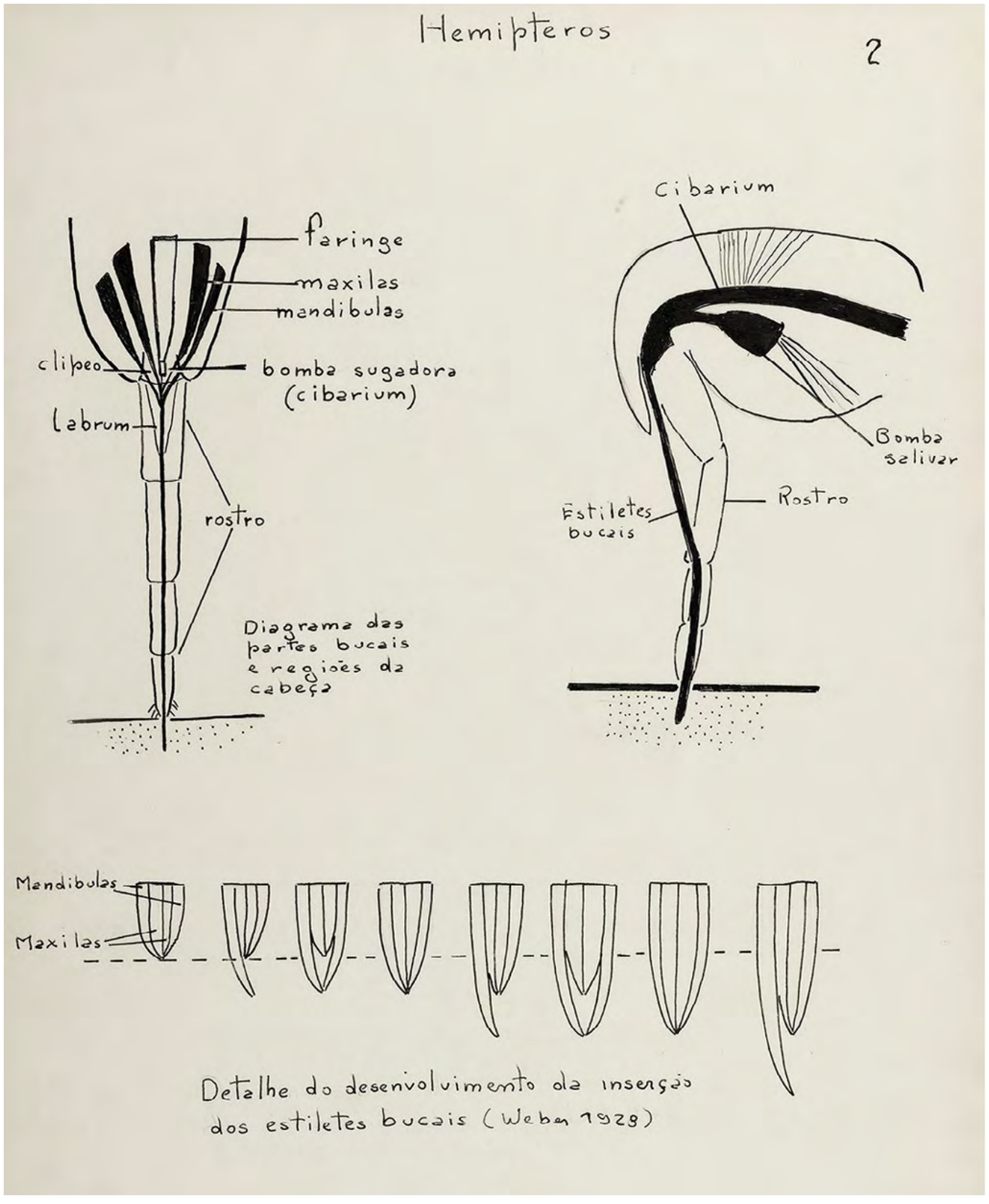
Dorsal and ventral views of abdomen of male and female *Microtomus conspicillaris* (Drury, 1782); details of bristles
1978
India ink; 89cm x 55cm



Ventral view of abdomen of male
Microtomus conspicillaris (Drury, 1782)
(highlight of the previous drawing)

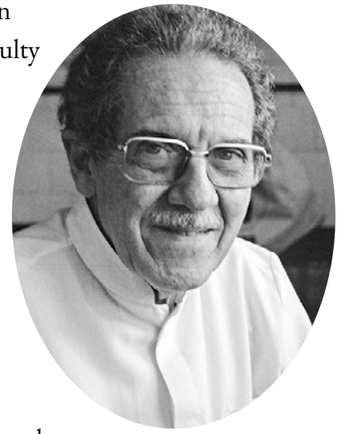


Morphology of heads of insects of the order Hemiptera. Teaching material on medical entomology
1972
India ink; 32.5cm x 22.5cm

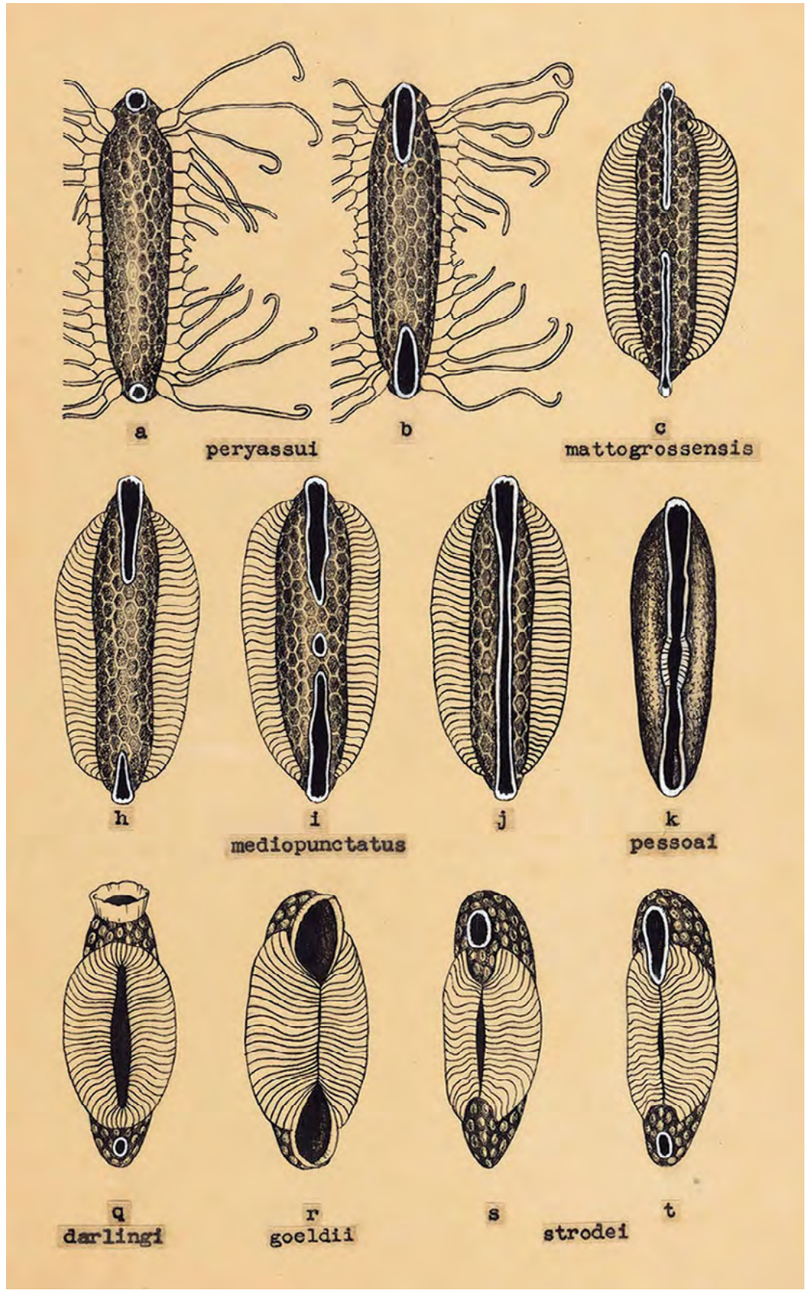


Morphology of mouthparts of insects of the order Hemiptera. Teaching material on medical entomology
1972
India ink; 32.5cm x 22.5cm

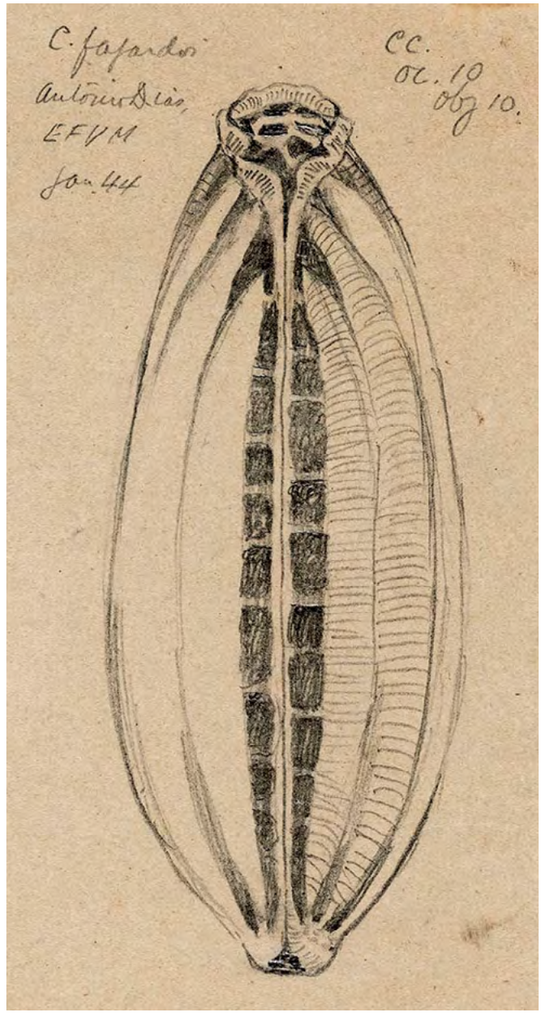
LEÔNIDAS DE MELLO DEANE

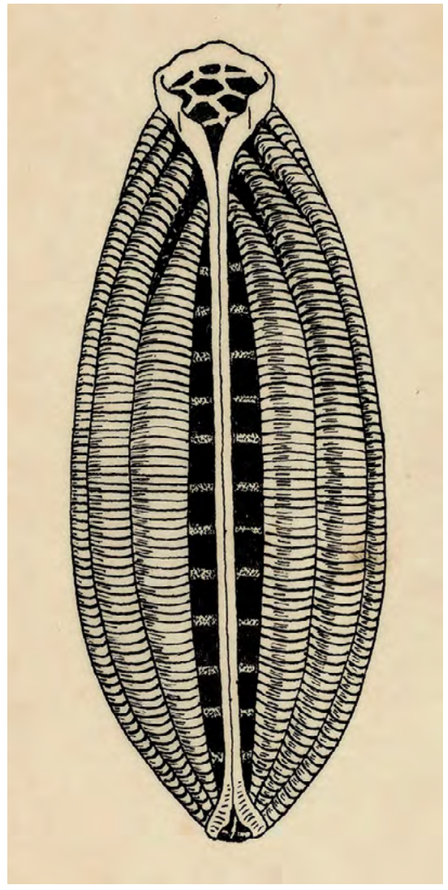


Leônidas Deane was born on March 18, 1914, in Belém, Pará. In 1935 he graduated from the Faculty of Medicine and Surgery of Pará, where he served as professor of microbiology in 1936. From 1936 to 1939, he was a parasitologist with the Institute of Experimental Pathology of the North and part of Evandro Chagas's team, which was doing pioneer research on visceral leishmaniasis and other rural endemic diseases. From 1939 to 1942 he was with the Malaria Service of the Northeast, taking part in entomological and epidemiological studies during the campaign against *Anopheles gambiae* mosquito. In 1940 he married Maria José von Paumgartten. After the mosquito was eradicated and the Malaria Service subsequently closed, he returned to Belém, where he was a parasitologist with the Special Public Health Service's Central Laboratory. From 1950 to 1953 he headed the Entomology Laboratory at the Malariology Institute in Rio de Janeiro. In 1953, at the recommendation of Samuel Pessoa, he transferred to the University of São Paulo School of Medicine, where he taught parasitology until 1970. In the 1960s, he played a prominent role in international institutions for medical and scientific research, such as the Pan American Health Organization and the World Health Organization. In 1970 he began teaching parasitology at the Faculty of Medicine of Northern Paraná and the Federal University of Minas Gerais and was also a visiting researcher at Imperial College, in Ascot, England, for a time. For political and personal reasons related to the 1964 military coup, he worked alongside his wife, Maria Deane, at the Institute of Hygiene and Tropical Medicine in Lisbon (1973-1975) and at Carabobo University in Venezuela (1976-1979). In 1980, again along with his wife, he transferred to the IOC as a full researcher and head of the newly established Department of Entomology. Although he officially retired in 1990, he continued doing research as head of the Laboratory of Hematozoa Transmitters. He died on January 30, 1993, in Rio de Janeiro.



Eggs of *Anopheles* mosquitoes from Brazil; dorsal view. Serviço de Malária do Nordeste (Northeastern Malaria Service)
1940s
India ink; 28cm x 19.5cm





Chagasia fajardi (Lutz, 1904); draft sketch and finished drawing of egg
N.d.
Graphite pencil; 12.5cm x 6cm
India ink; 16cm x 8cm

LUIZ KATTENBACH

Luiz Kattenbach was born in Rio de Janeiro on August 27, 1898, and grew up in the neighborhood of Laranjeiras. He studied painting at the National School of Fine Arts and graduated in 1920. In 1921 the IOC hired him as a sketch artist aide and he stayed there until at least 1928, doing drawings and watercolors for Lauro Travassos, Arthur Neiva, Eurico Villela, César Ferreira Pinto, and other researchers. In addition to doing illustrations, he was a painter, teacher, and art critic. Kattenbach was long active in fine arts and held exhibits at major galleries in the 1920s and 1930s. The year he graduated college, he received a bronze medal at the 27th General Fine Arts Exposition, one of the main events on the Brazilian art circuit at that time. Through 1933, his works were displayed at a number of these expositions; at the 1930 event, he received a silver medal. He died on November 3, 1953, in Rio de Janeiro.

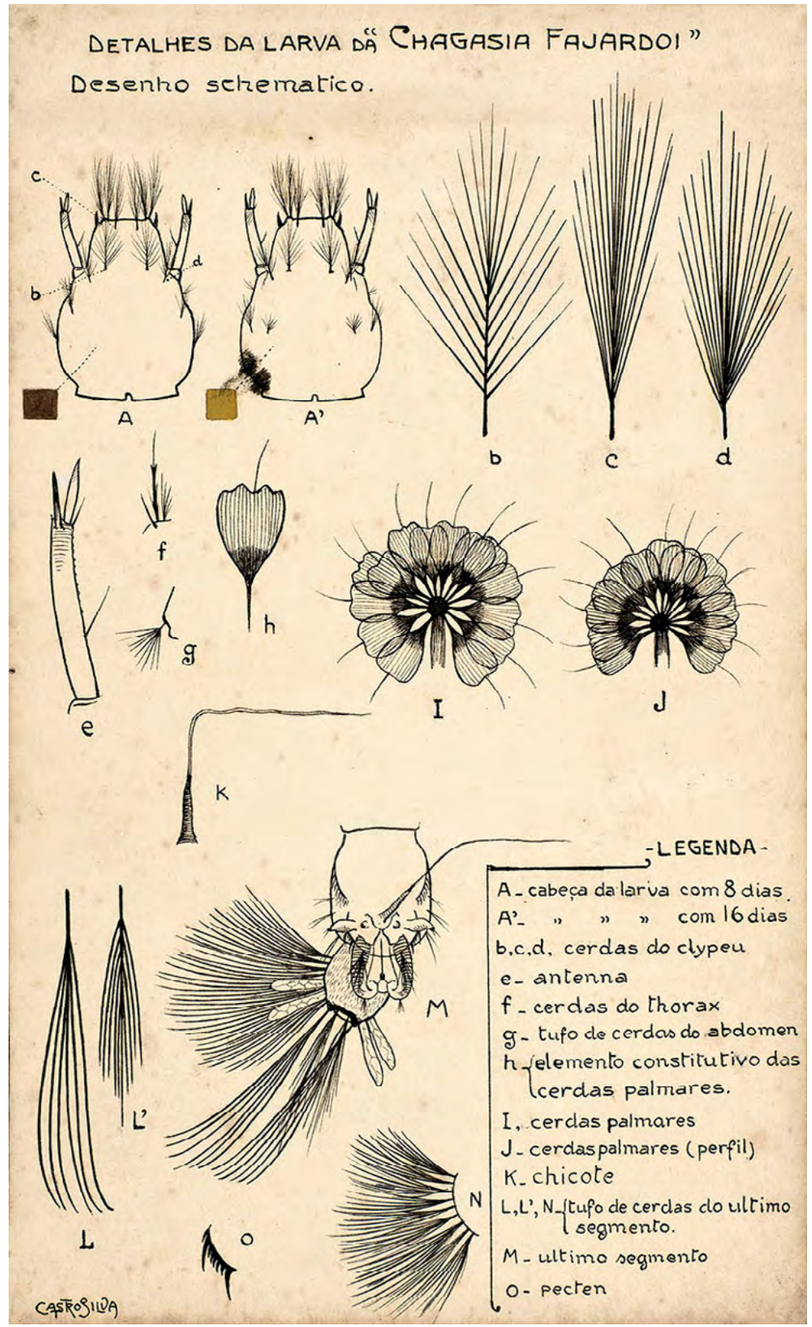
L. Kattenbach

Dorsal side of female specimen of *Cimex limai,* now *Propicimex limai* (Pinto, 1927); parasitic insect that feeds on bats
1920s
India ink; 29.5cm x 20cm

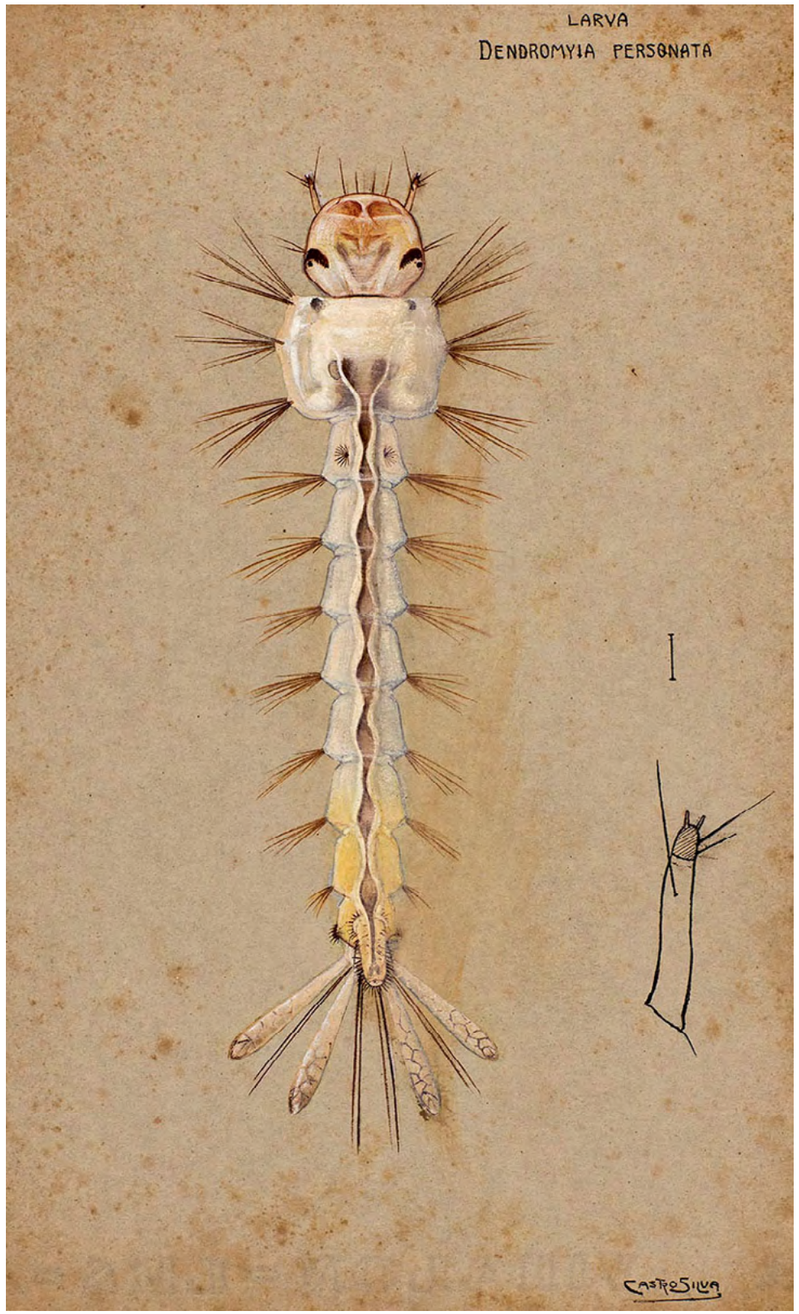
MANOEL DE CASTRO SILVA

Manoel de Castro Silva was the first sketch artist of Manguinhos. He joined the Instituto Soroterápico Federal in 1906 at the invitation of Oswaldo Cruz to work as a sketch artist, a position in which he was hired two years later at the then IOC. During the Spanish flu epidemic in 1918, he was transferred to the hospital and urgent care unit in the outlying neighborhood of Ramos, where his work earned the praise of both Carlos Chagas and the hospital director. In 1921 he was temporarily assigned to the post of librarian but returned to his job as sketch artist the following year; in 1931 his post was re-categorized as head sketch artist. While at the IOC, he produced many drawings related to insects, protozoa, helminths, and anatomic pathology, illustrating papers and books by such institute researchers as Oswaldo Cruz, Arthur Neiva, Antonio Gonçalves Peryassú, César Ferreira Pinto, Carlos Chagas, Gaspar Vianna, Angelo Moreira da Costa Lima, and Adolpho Lutz. He also served as a drawing instructor at the João Alfredo Professional Institute in the city of Rio de Janeiro. He was paid tribute in the naming of the helminth species *Castroia silvai* Travassos, 1928 and *Longistriata castrosilvai* Almeida, 1934. He died on May 12, 1934, in Rio de Janeiro. The following note appeared in *Memórias do Instituto Oswaldo Cruz* at the time of his death:

> With profound recognition, this institution would like to recognize the commendable work of Castro e Silva, countless times reproduced in our contemporary scientific literature. With the naked eye or the aid of instruments, he applied his perspicacity and acuity to seeing and capturing, faithfully and minutely, the matter at hand. Moreover, he stamped the seal of a great artistic personality on his artwork (v.28, n.4, p.1).

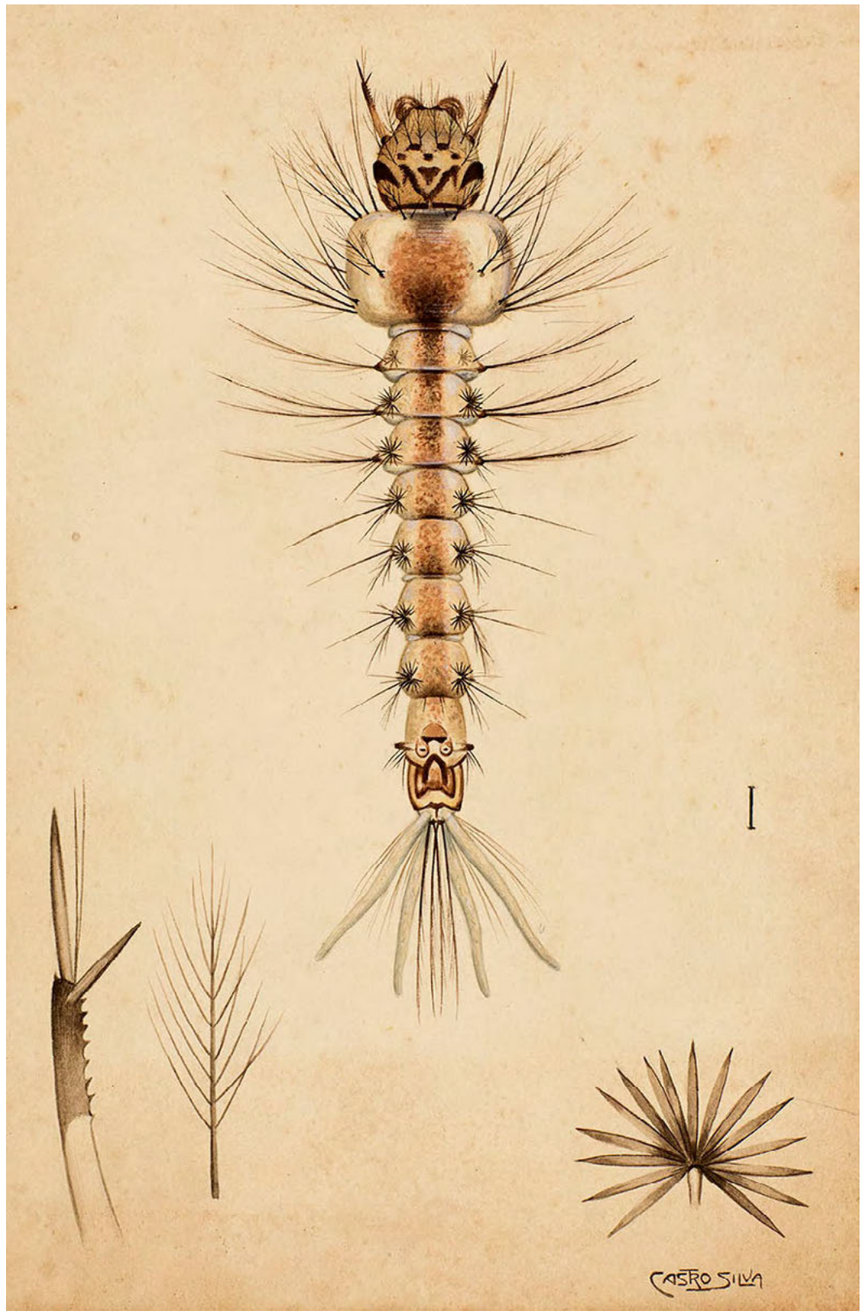


Chagasia fajardi (Lutz, 1904); larva structures
1906-1907
India ink and watercolor; 23cm x 14cm

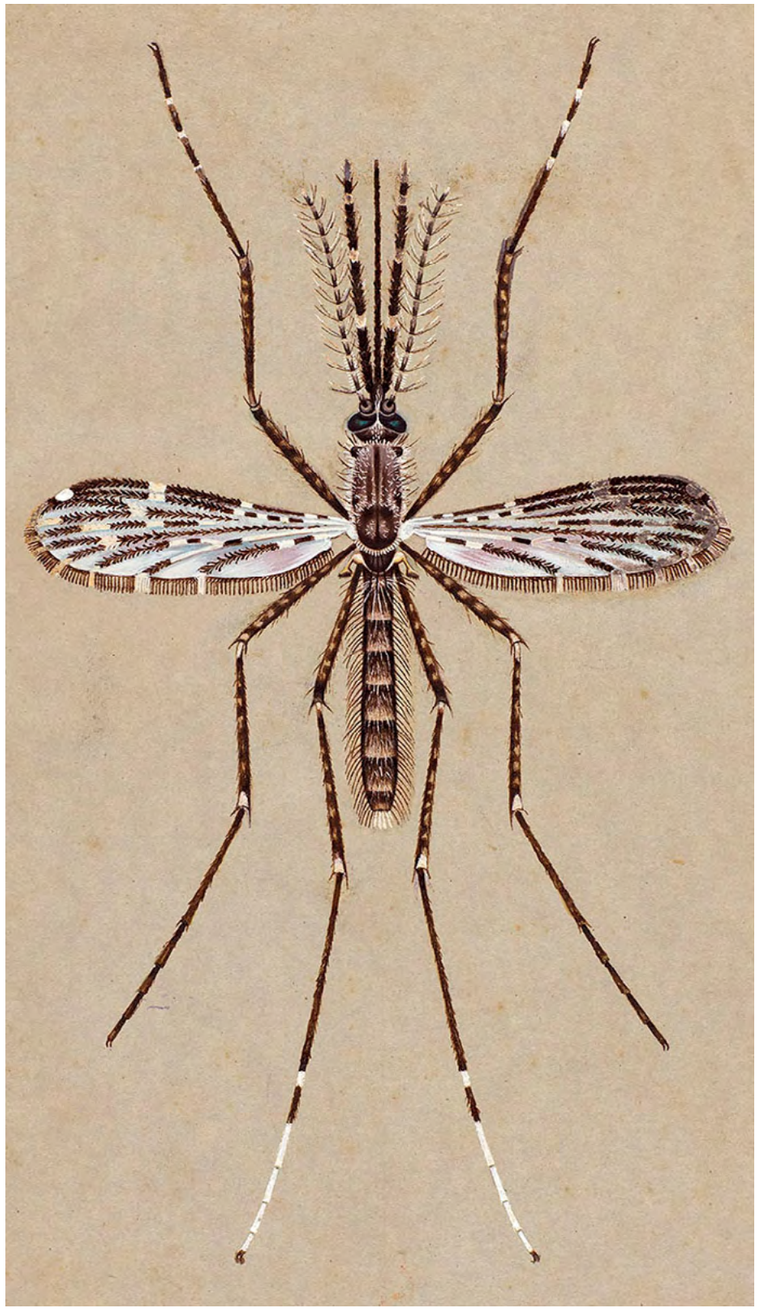


Dendromyia personata, now *Onirion personatum* (Lutz, 1904); dorsal view of larva
1906-1907
India ink and watercolor; 21cm x 14cm

MANOEL DE CASTRO SILVA



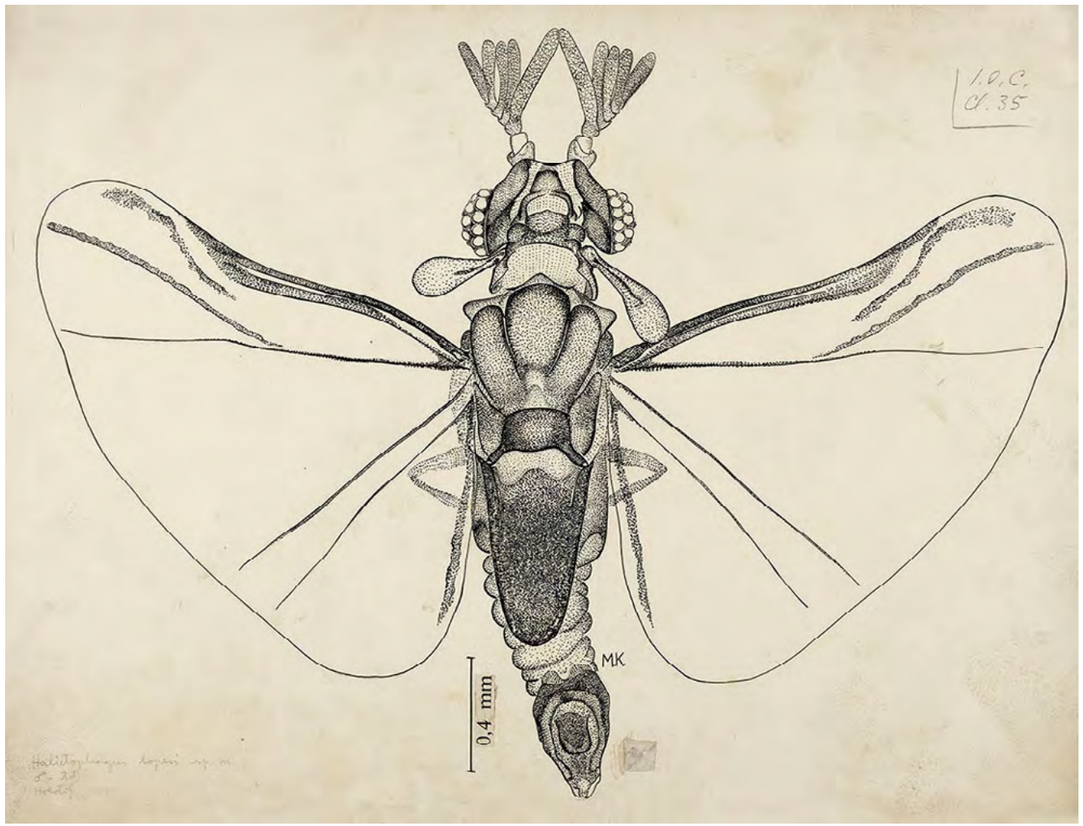
Myzorhynchella lutzii, now *Anopheles lutzii* Cruz, 1901*;* dorsal view of larva
1906-1907
India ink and watercolor; 23cm x 14cm



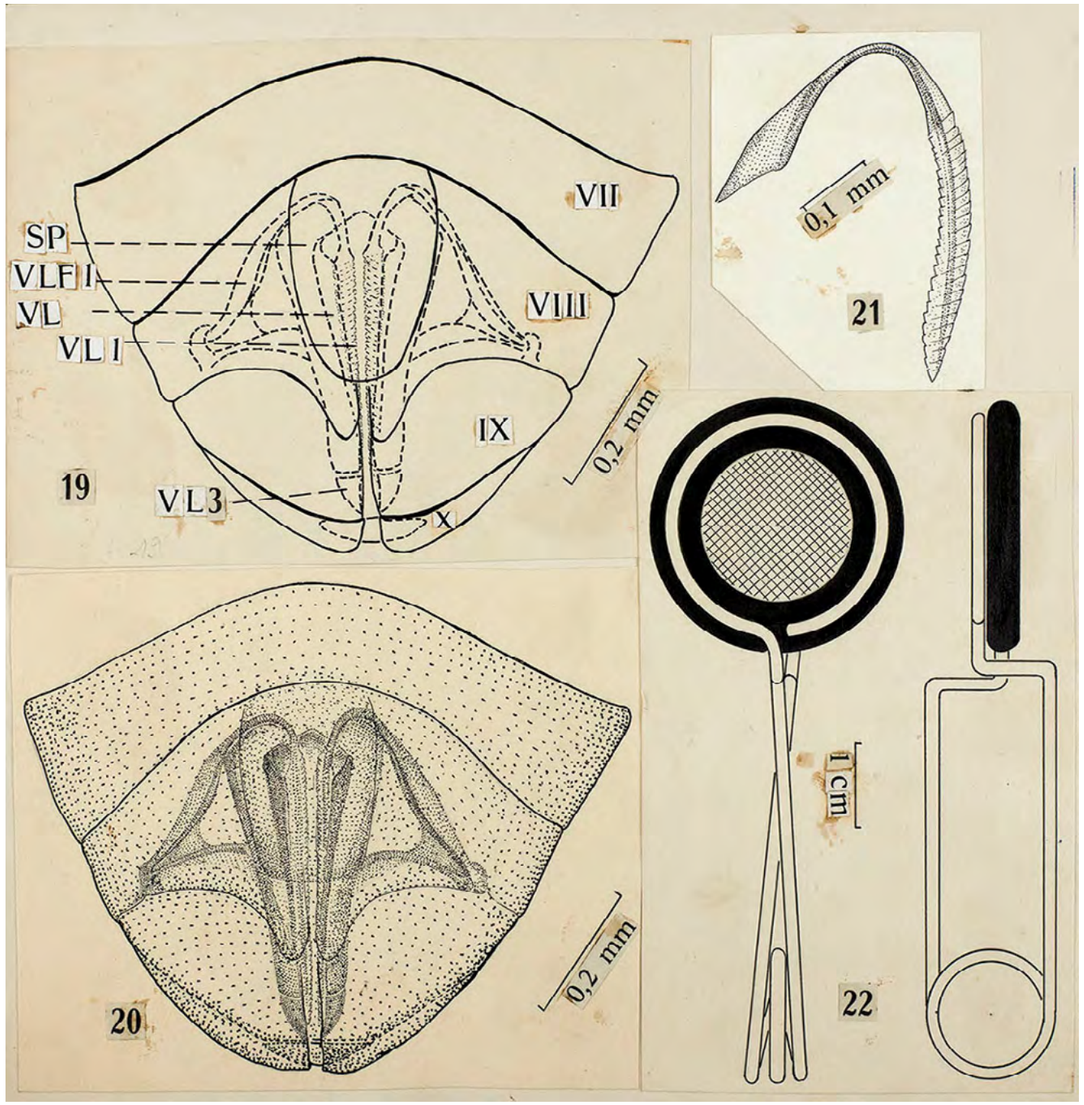
Myzorhynchella parva, now *Anopheles parvus* (Chagas, 1907); dorsal view of adult mosquito
1906-1907
India ink and watercolor; 21cm x 14cm

MARCOS KOGAN

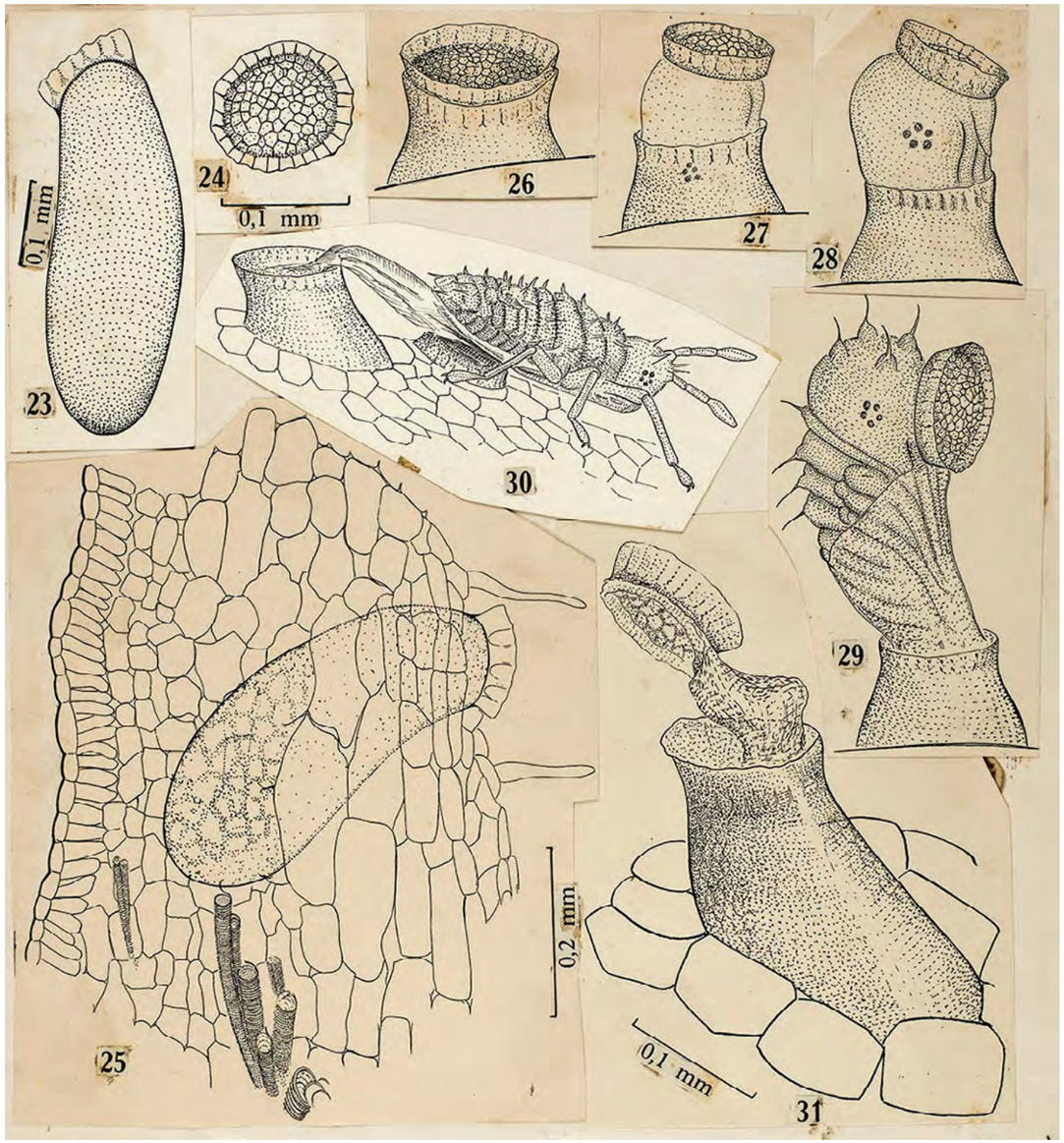
Marcos Kogan was born on June 9, 1933, in Rio de Janeiro. In 1961 he graduated with a degree in agronomy from the National School of Agronomy, part of what was then the Rural University of Rio de Janeiro. Starting in college, he interned at the IOC with Sebastião de Oliveira, remaining until 1962. From 1962 to 1965 he was an agronomist for the Institute for Agriculture and Livestock-Raising Research and Experimentation, part of the Ministry of Agriculture. In 1963 he returned to the IOC as a biologist with the Zoology Division's Entomology Section. During this time, he published articles on the biology and taxonomy of Coleoptera and Strepsiptera and on tomato and citrus pests. He spent 1966-1967 as a Guggenheim fellow at the University of California, Riverside, studying the biological and physiological factors in the specific selection of hosts by zoo and phytoparasitic insects. He did his doctorate at the same university in 1968-1970, once again funded by the John Simon Guggenheim Memorial Foundation. He maintained his ties to the IOC and was appointed biology researcher in 1970 but left the post in 1974. He later worked for the Illinois Natural History Survey and the University of Illinois. In 1991 he was named director of the Integrated Plant Protection Center at Oregon State University. He retired in 2003 but continued to research insects in his areas of interest. He received the title of emeritus professor from both the University of Illinois and Oregon State University.



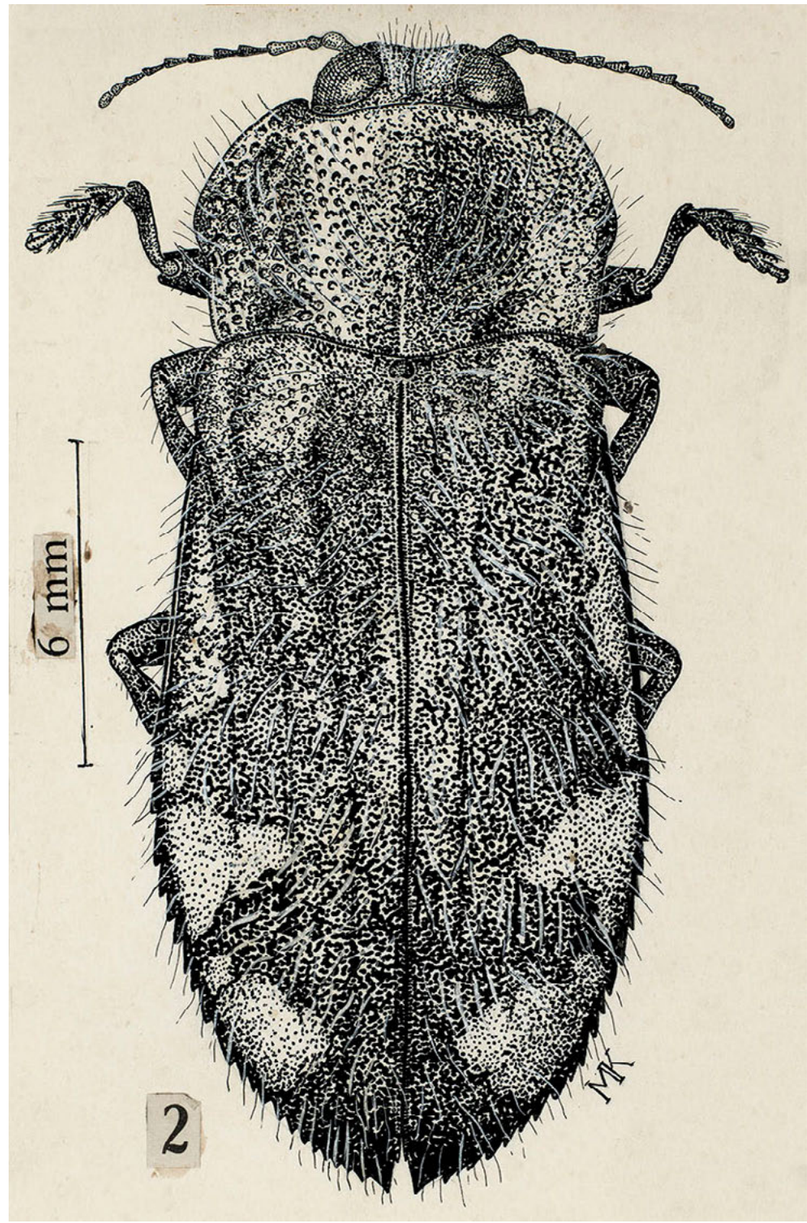
Halictophagus lopesi Oliveira & Kogan, 1959; dorsal view of male
1959
India ink; 27cm x 35.5cm



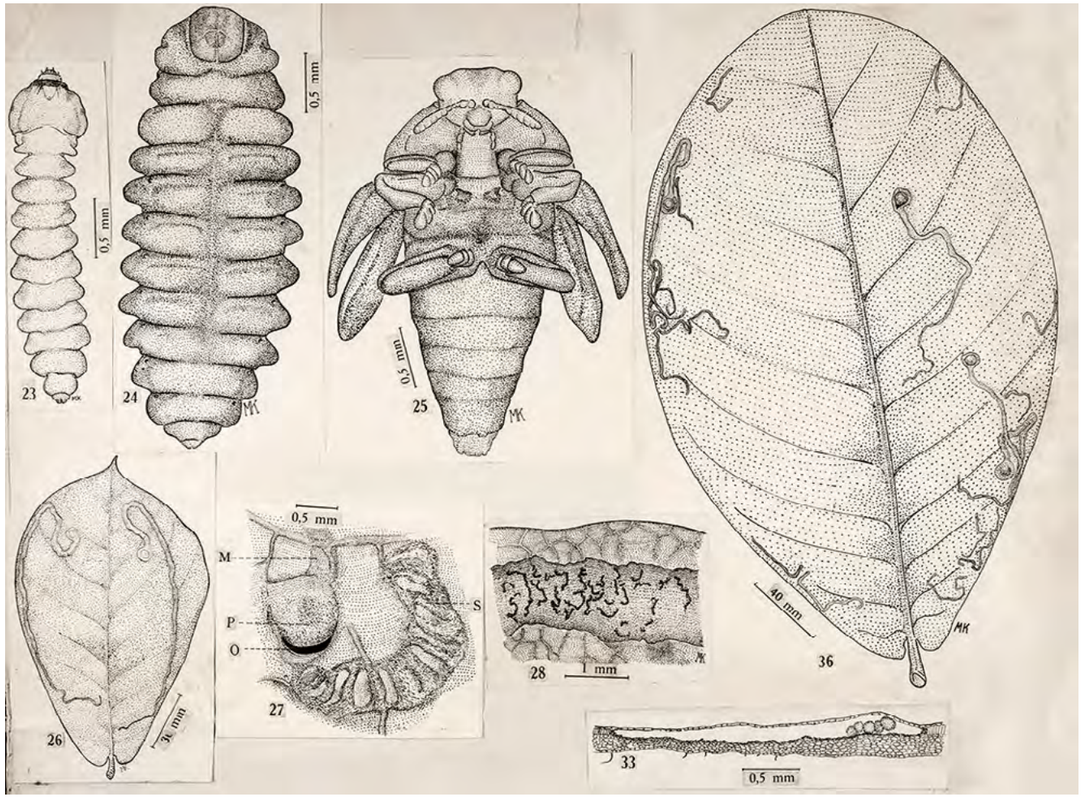
Corythaica cyathicollis (Costa, 1864); female genitalia and instrument used for control purposes when raising specimens. Insect pest that attacks Solanaceae, such as tomatoes and eggplants
1960
India ink; 28cm x 28.5cm



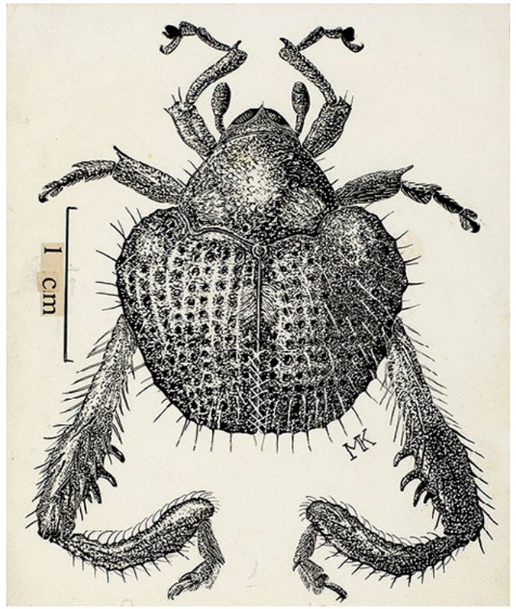
Corythaica cyathicollis (Costa, 1864); eggs on the leaves of a tomato plant and phases of hatching of neanide
1960
India ink; 35cm x 33cm



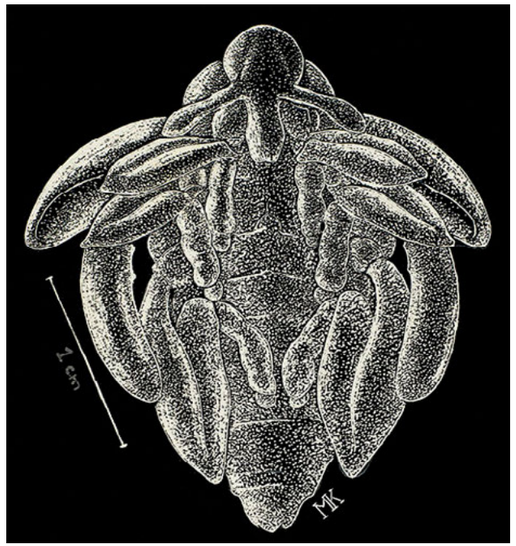
Hypoprasis harpagon Fairmaire & Germain, 1864; dorsal view of full body. Specimen collected in Chile; part of Carlos Alberto Campos Seabra's Buprestidae collection
1960
India ink; 18.5cm x 11.5cm



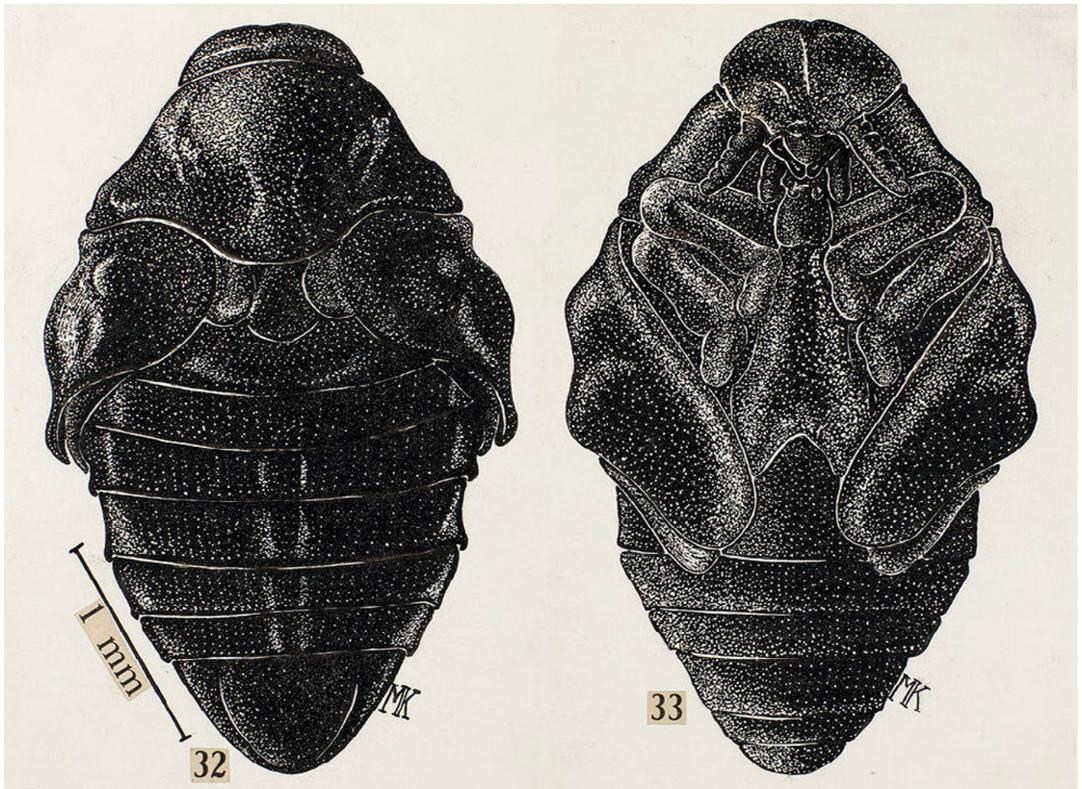
Pachyschelus subundulatus Kerremans, 1896; stages of development and oviposition on a *Terminalia catappa* leaf
1963
India ink; 59cm x 55cm



Tachygonus minans Kogan, 1963; dorsal view. Specimen collected by the author in the Rio de Janeiro Botanical Garden
1963
India ink; 16cm x 13cm



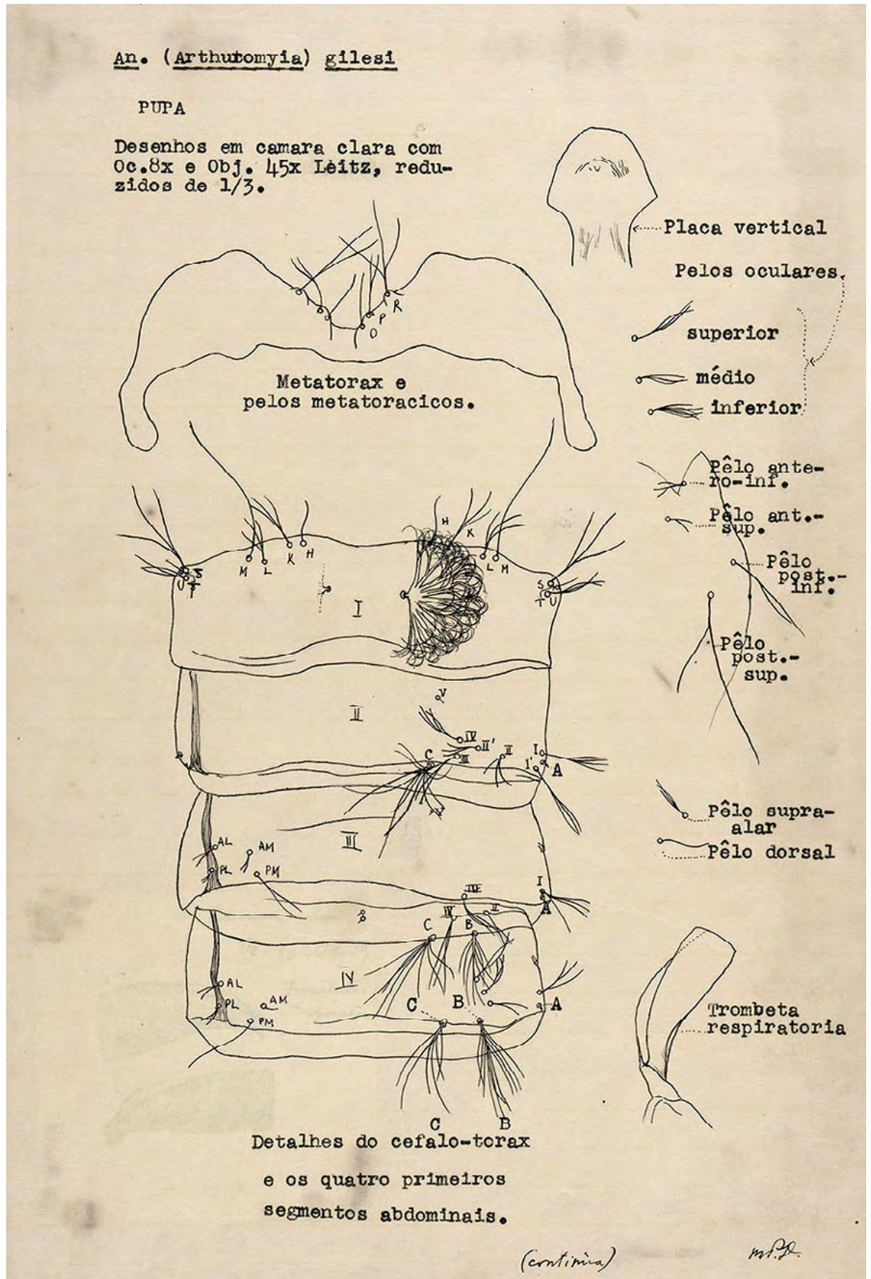
Tachygonus minans Kogan, 1963; ventral view of pupa. Specimen collected by the author in the Rio de Janeiro Botanical Garden
1963
India ink (scratchboard); 15cm x 13cm



Brachys ingae Kogan, 1964; dorsal and ventral views of pupa. Specimen collected on an *Inga sessilis* tree in Serra dos Órgãos National Park, Rio de Janeiro
1964
India ink (scratchboard); 15cm x 20cm

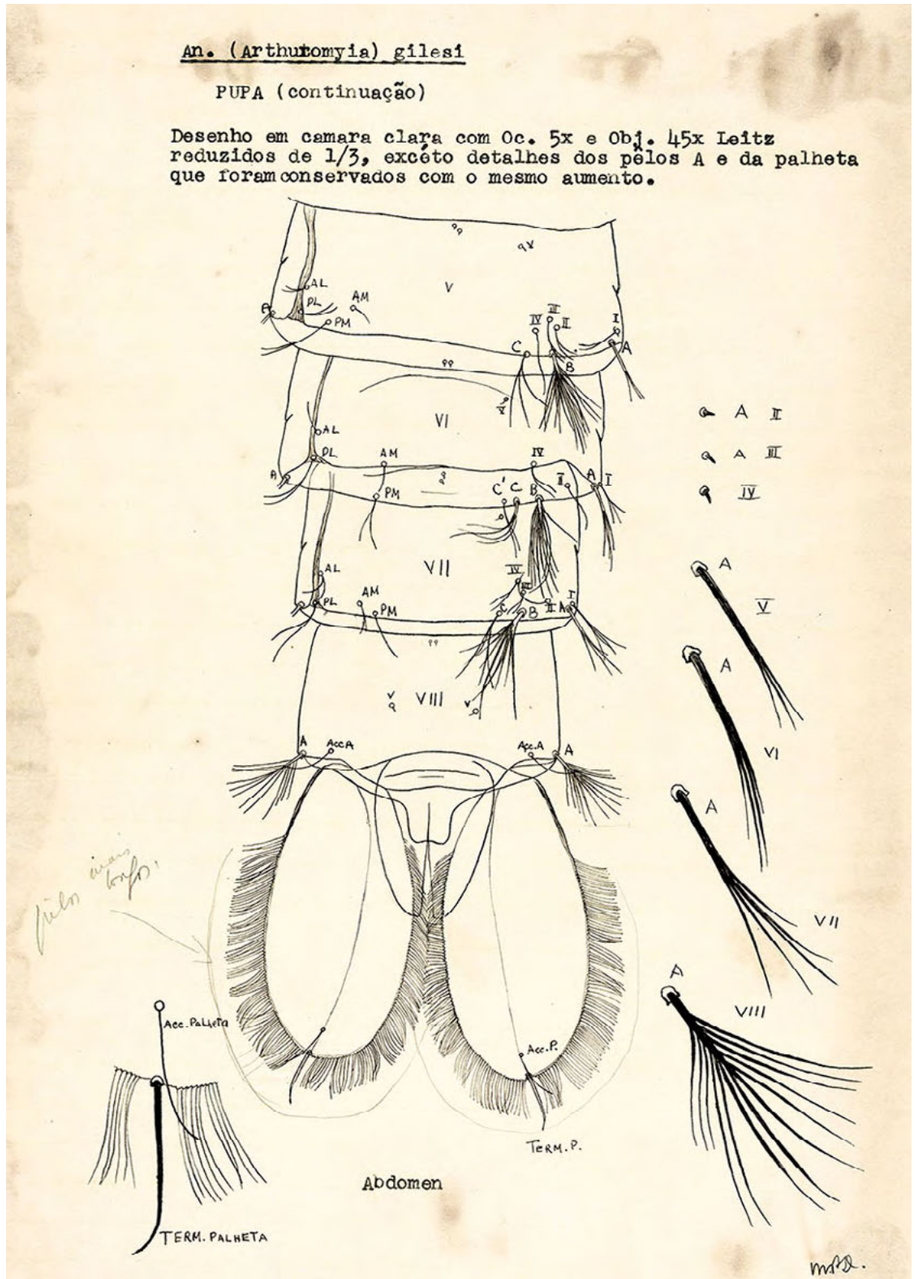
MARIA JOSÉ VON PAUMGARTTEN DEANE

Maria Deane was born on July 24, 1916, in Belém, Pará. She graduated from the Faculty of Medicine and Surgery of Pará in 1937. While studying there, she was an assistant with the Commission Assigned to Study American Visceral Leishmaniasis and later with the Service for the Study of Major Endemic Diseases, both led by Evandro Chagas. In 1939 she transferred to the Malaria Service of the Northeast and participated in the successful campaign against the *Anopheles gambiae* mosquito in the states of Ceará and Rio Grande do Norte. The following year she married Leônidas Deane, who partnered with her on major studies in parasitology and medical entomology. In 1942 she became an assistant with the Special Public Health Service's Parasitology Department; three years later, she was assigned to head up the Parasitology Section of the agency's central laboratory. In 1953, along with her husband, she enrolled at the University of São Paulo School of Medicine. During 1958-1959 she led the Entomology Laboratory, attached to the Ministry of Health's Malaria Eradication Campaign. In 1961 she began working at the Institute of Tropical Medicine in São Paulo. From 1969 on, she worked at a number of institutions: the Taubaté Faculty of Medicine, the Federal University of Minas Gerais (1971-1973), the Institute of Hygiene and Tropical Medicine in Lisbon (1973-1975), and Carabobo University in Venezuela (1976-1979). In 1980, again with Leônidas Deane, she transferred to the IOC, where she first served as interim head of the Center for Electronic Microscopy. In the following years, she was head of the Protozoology Department (1980-1988) as well as vice director (1986-1988) and head of the Biology of Trypanosoma Laboratory (1992-1995). She died on August 13, 1995, in Rio de Janeiro.



Anopheles gilesi (Neiva, 1908); details of the cephalothorax and first four abdominal segments of pupa. Serviço de Malária do Nordeste (Northeastern Malaria Service)
1941
India ink; 28cm x 21.5cm

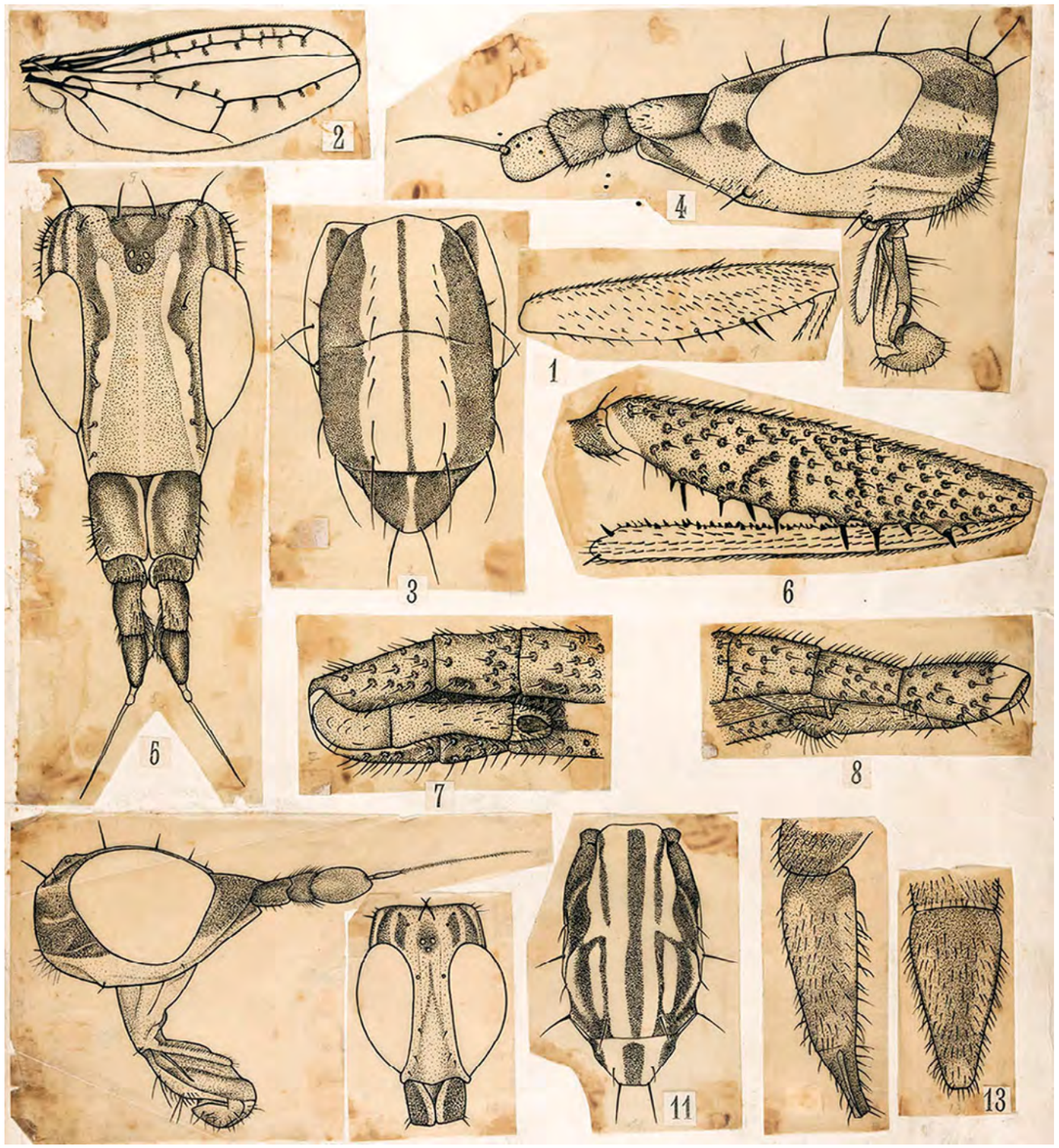
MARIA JOSÉ VON PAUMGARTTEN DEANE



Anopheles gilesi (Neiva, 1908); posterior portion of abdomen and details of bristles of pupa. Serviço de Malária do Nordeste (Northeastern Malaria Service)
1941
India ink; 28cm x 21.5cm

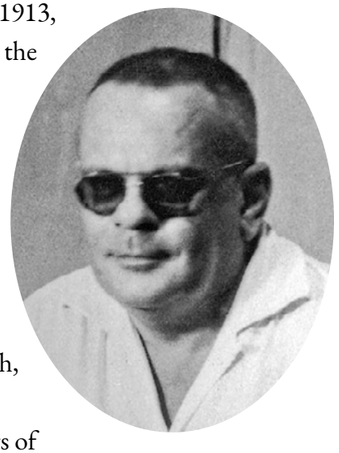
MARTÍN LADISLAO ACZÉL

Martín Ladislao Aczél was born on June 8, 1906, in Budapest, Hungary. In 1933, he received his doctorate from the Royal Hungarian University of Sciences with a dissertation on botany. From 1934 to 1945 he worked as an applied entomologist at the Royal Hungarian Institute for Plant Protection, sparking his interest in the taxonomy of insects of the order Diptera. In 1937 he published his first paper on fruit flies. In 1943 he was appointed professor of dipterology at his alma mater. After World War II, Aczél and his family left Hungary and spent more than two years living in refugee camps in the French-occupied zone of Austria. He immigrated to Argentina in 1948. There he taught entomology at the National University of Tucumán's Miguel Lillo Institute, where he resumed research into Diptera and became a leading authority on Neotropical flies. His research was focused especially on the families Dorilaidae (Pipunculidae), Tephritidae (Tripeptide), Tylidae, Neriidae, *Musidoridae* (Lonchopteridae), Muscidae, Clythiidae (Platypezidae), and Pyrgotidae. He died on April 28, 1958, in Tucumán, Argentina.

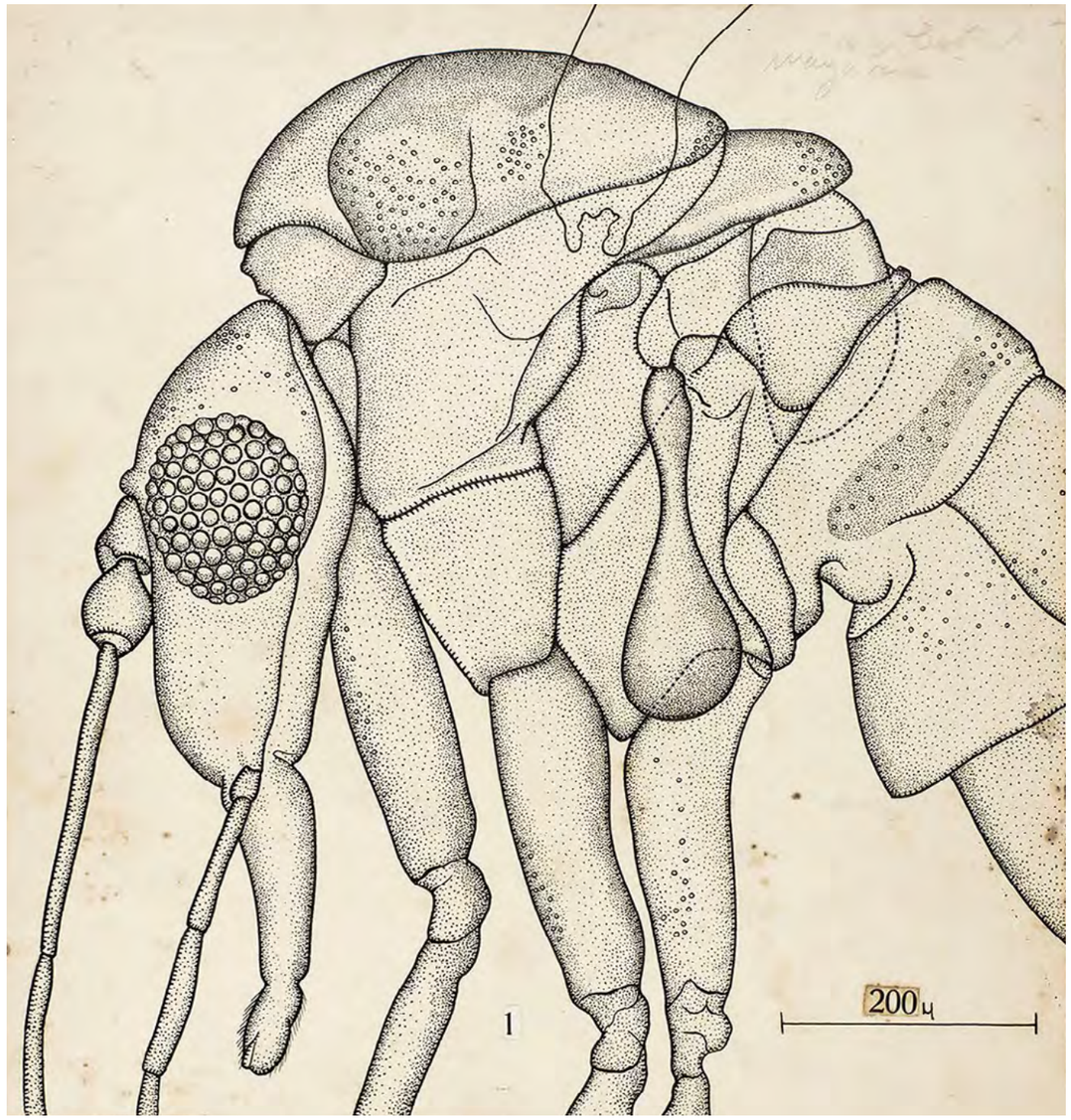


Structures of the wing, head, mesonotum, foot, epandrium, and ovipositor of fly species of the family Neriidae: *Eoneria blanchardi* Aczél, 1951; *Eoneria maldonadoi* Aczél, 1961; *Eoloxozus sabroskyi* Aczél, 1961; and *Imrenerius cinereus,* now *Antillonerius cinereus* (Roder, 1885)
1961
India ink; 41cm x35.5 cm

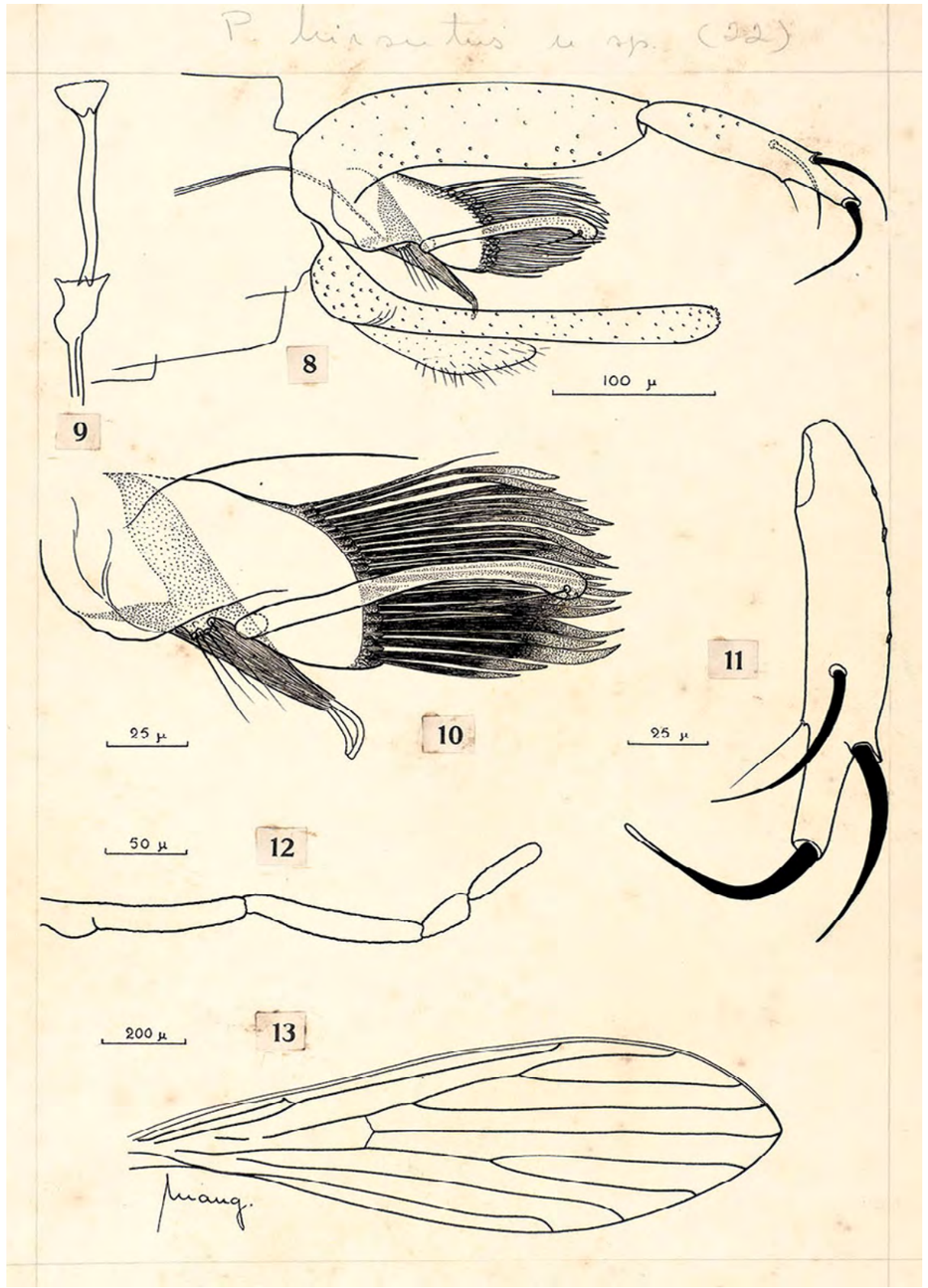
OCTÁVIO MANGABEIRA FILHO



Octávio Mangabeira Filho was born on July 13, 1913, in the city of Rio de Janeiro. He graduated from the University of Rio de Janeiro School of Medicine in 1936 and took the IOC Specialization Course in 1936-1937. He joined the IOC staff as a specialized technician in 1938 and worked with the Commission Assigned to Study American Visceral Leishmaniasis, led by Evandro Chagas, with head offices at the Institute of Experimental Pathology of the North, in Belém, Pará. It was around this time that he initiated his research of Phlebotominae as vectors of leishmaniasis. In 1940 Evandro Chagas invited him to participate in the Service for the Study of Major Endemic Diseases, which took him on travels about the North and Northeast to gather substantial entomological material. After Evandro Chagas passed away that year, Mangabeira continued his work with Phlebotominae at the IOC. He was promoted to entomologist in 1945 and to researcher in 1947. From 1943 to 1944 he was on a fellowship from the Pan American Sanitary Bureau to visit epidemiological research centers in Latin America. In 1950 he restructured the Bahia Institute of Public Health at the Gonçalo Moniz Foundation, which he directed until 1956. In 1957, with a view to studying leishmaniasis, Chagas disease, and schistosomiasis, he established the Bahia Research Center as part of the National Institute of Rural Endemic Diseases. From 1956 to 1959 he was a technical advisor to the Minister of Health. He gathered information for the IOC on visceral leishmaniasis in the states of Bahia, Minas Gerais, and São Paulo. Over the course of his career, he was responsible for standardizing studies of the systematics, morphology, and biology of leishmaniasis vectors and also described some forty new species. Alongside Hugo de Souza Lopes, he published papers on insects of the families Muscidae and Bittacidae. He died on May 4, 1963, in Salvador, Bahia.



Flebotomus lenti, now *Lutzomyia lenti* (Mangabeira, 1938); lateral view of head, thorax, and part of the abdomen of male, plus details of antennae. Collected by Herman Lent and João Ferreira Teixeira de Freitas in 1933 in the town of Lassance, Minas Gerais
1938
India ink; 26cm x 25cm

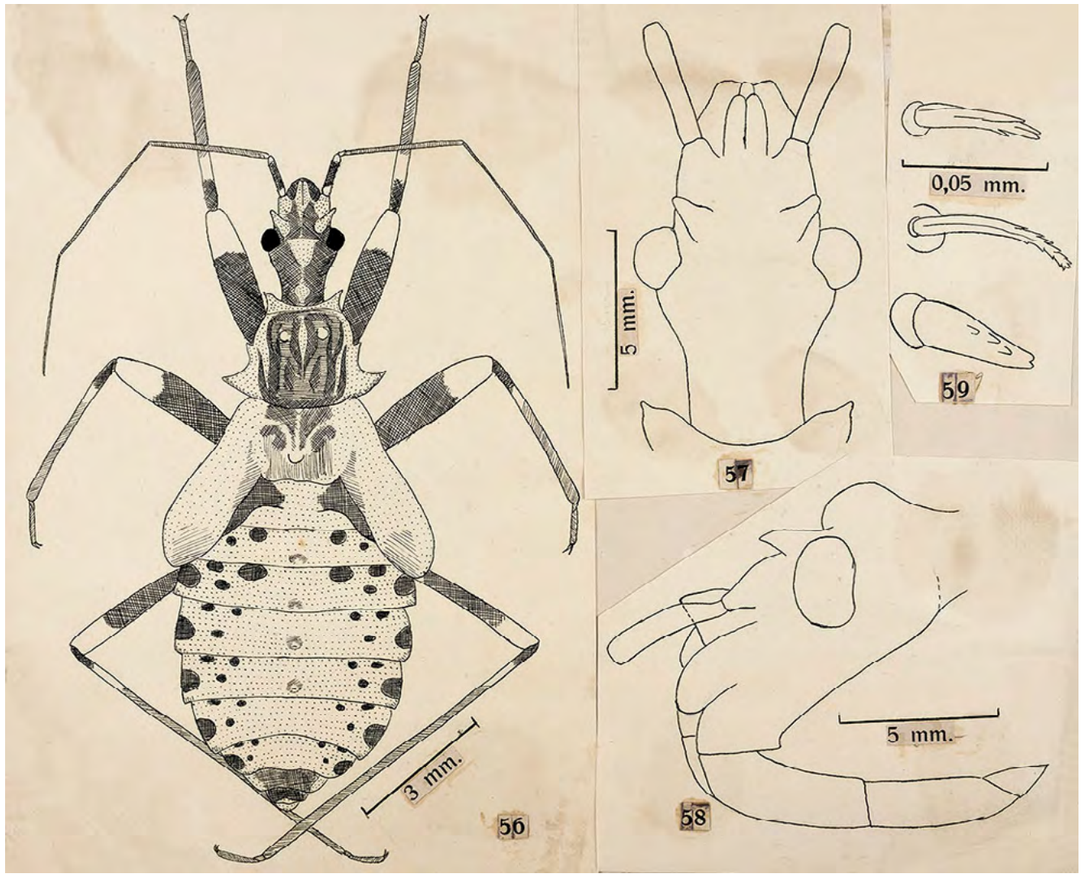


Flebotomus hirsutus, now *Psychodopygus hirsutus* (Mangabeira, 1942). Male specimen captured in Abaeté, Pará, in 1938.
Comissão de Estudos de Leishmaniose Visceral Americana (Commission for Studies of American Visceral Leishmaniasis)
1942
India ink; 34.5cm x 24cm

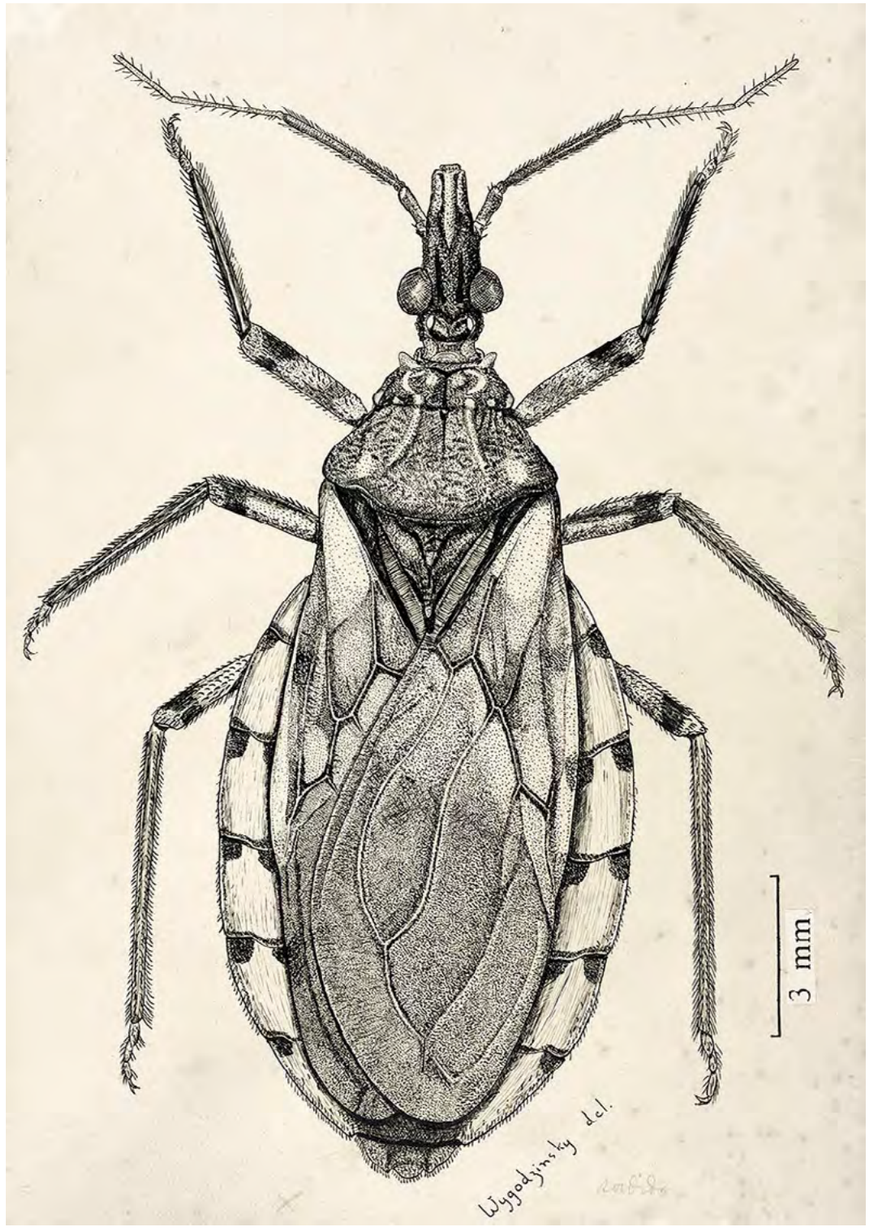
PETR WOLFGANG WYGODZINSKY

Petr Wygodzinsky was born on January 27, 1916, in Bonn, Germany. He received his PhD from the University of Basil, in Switzerland, in 1941. That same year, after spending a short period in Portugal, he immigrated to Brazil. He was a taxonomist with the National Malaria Service and later with the Institute for Agricultural Ecology and Experimentation, part of the Ministry of Agriculture, in Rio de Janeiro. During his time in Brazil, he formed friendships with a number of researchers, including Herman Lent and Hugo de Souza Lopes. With Lent, he did studies of insects of the family Reduviidae. In 1948 he transferred to the National University of Tucumán, in Argentina, where he was a specialist in the taxonomy of Simuliidae (black flies) at the Regional Institute of Medicine and a professor of entomology and genetics at the School of Natural Sciences. In 1954 he transferred to the Miguel Lillo Institute, which was part of the same university, and from 1959 to 1962 taught entomology at the University of Buenos Aires. While he was in Argentina, he was awarded two fellowships by the John Simon Guggenheim Memorial Foundation to study at the University of California, Berkeley (1955 and 1960). In 1962 he joined the staff at the American Museum of Natural History in New York, where he was curator of the Diptera and Heteroptera collections until the close of his career. Of special note among the more than two hundred papers that he published were monographs on Emesinae (1966) and Enicocephalidae (1991), plus a review of Triatominae authored with Lent (1979). He was a distinguished illustrator and produced some 21,000 scientific drawings. By doing his own sketches, Wygodzinsky said, a researcher gains a better understanding of an insect's morphological structure. He died on January 27, 1987, in Middletown, New York.

Wygodzinsky del.



Opisthacidius sp.; nymph, fifth instar, and structures of head and bristles
1947
India ink; 23.5cm x 28cm

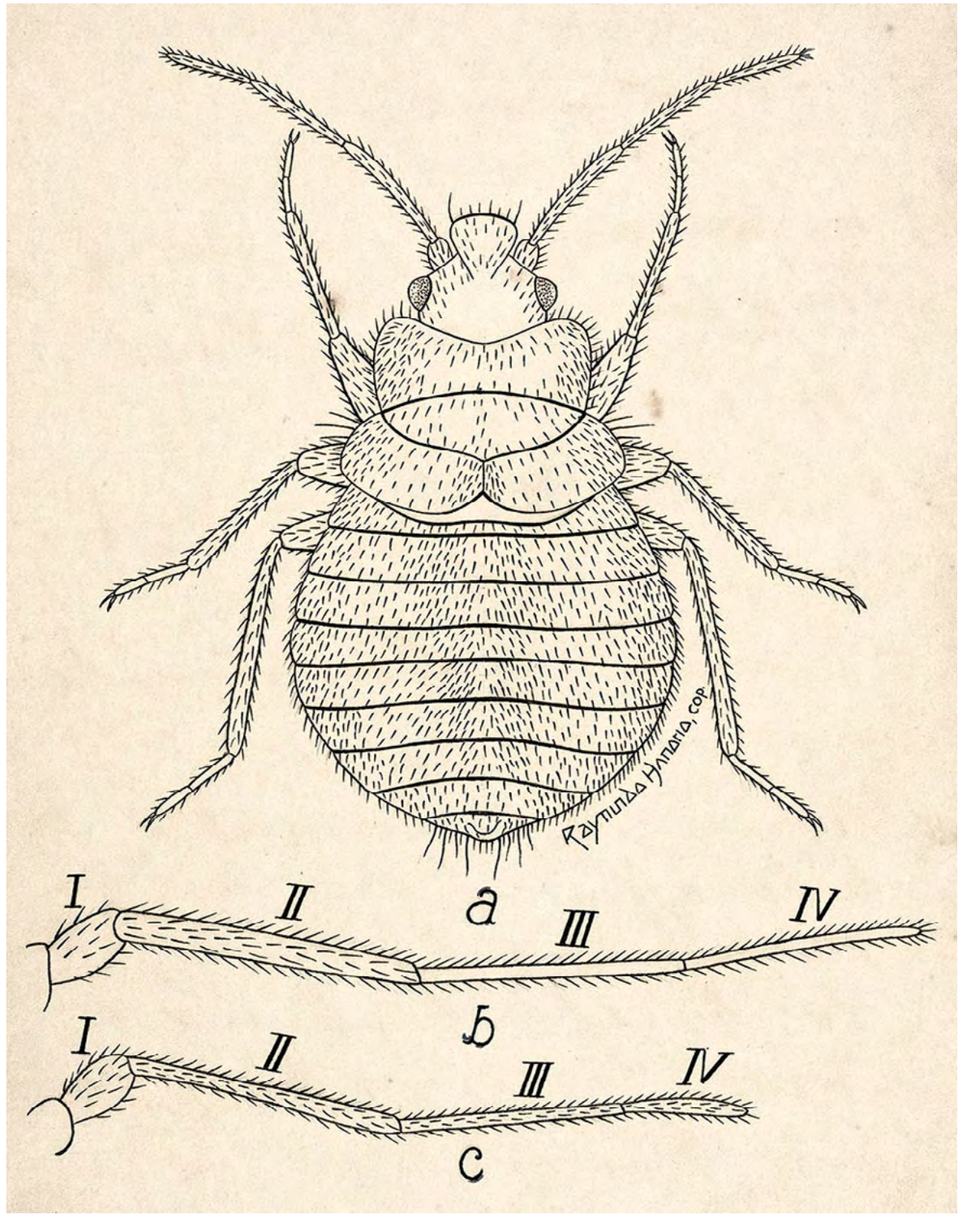


Triatoma sordida Stål, 1859; dorsal view of female
N.d.
India ink; 26.5cm x 18.5cm

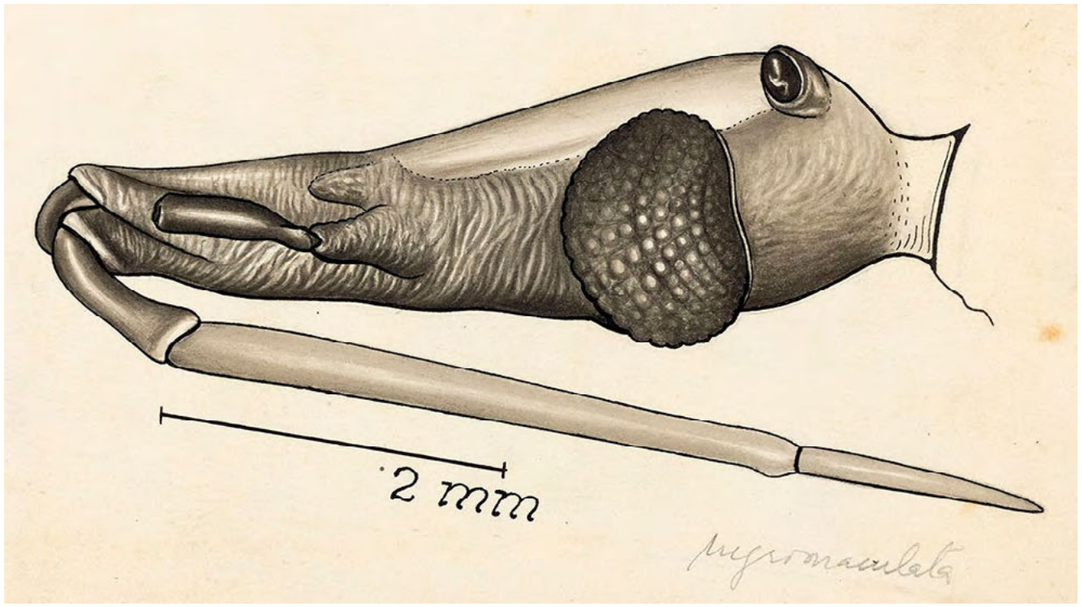
RAYMUNDO HONÓRIO DANIEL

Raymundo Honório Daniel was born in São Paulo and joined the staff at the IOC in 1915 as a junior aide, remaining at this post until 1921. He returned to the institution in 1927 and was a sketch artist there until 1944. He worked with such IOC researchers as Lauro Travassos, Adolpho and Bertha Lutz, César Ferreira Pinto, Fábio Leoni Werneck, Herman Lent, Angelo Moreira da Costa Lima, and Carlos Bastos Magarinos Torres. In 1944 he took a post as a sketch artist with the Federal District, which was then the city of Rio de Janeiro; the following year, he served on the examination committee for the agency's qualifying exam for specialized sketch artist. In 1960 he was appointed to the Guanabara Department of Hospital Assistance, after which he retired, in 1961, assigned to Pedro Ernesto Hospital, which was part of the department. In 1954 he was hired as a sketch artist by the University of Brazil National School of Medicine, now the Federal University of Rio de Janeiro, where he worked until 1987.

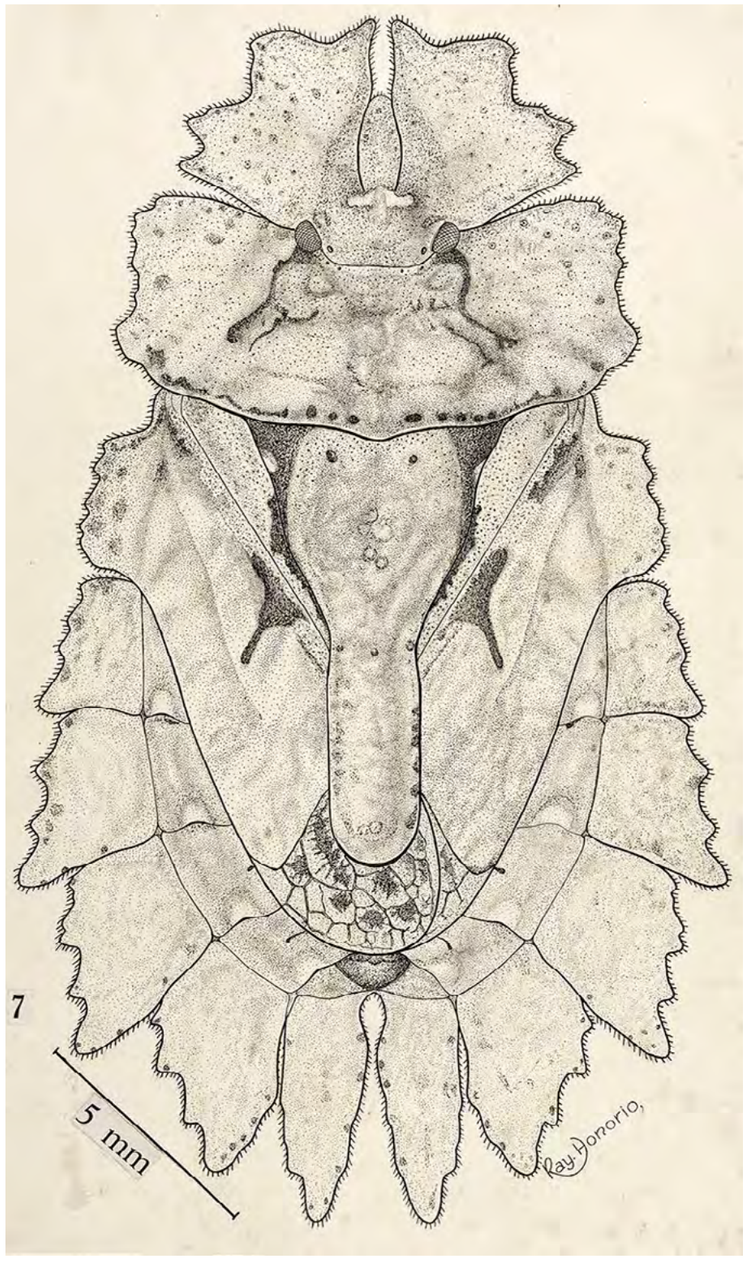
Ray. Honorio.



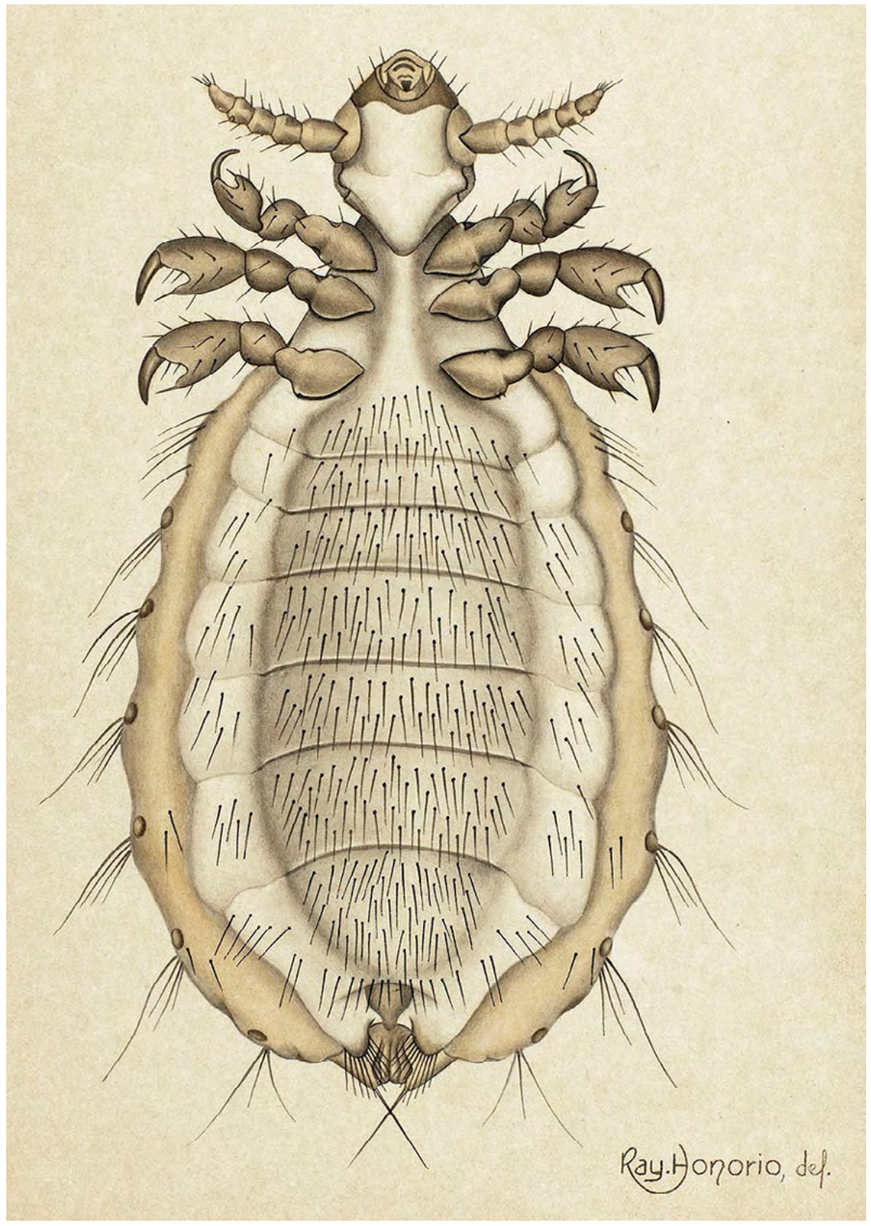
Dorsal side and antenna of female *Haematosiphon inodora* (Dugès, 1892) (a, b) and antenna of *Cimex lectularius* (Linnaeus, 1758) (c); bedbugs that parasitize birds and mammals
1930
India ink; 25.5cm x 18cm



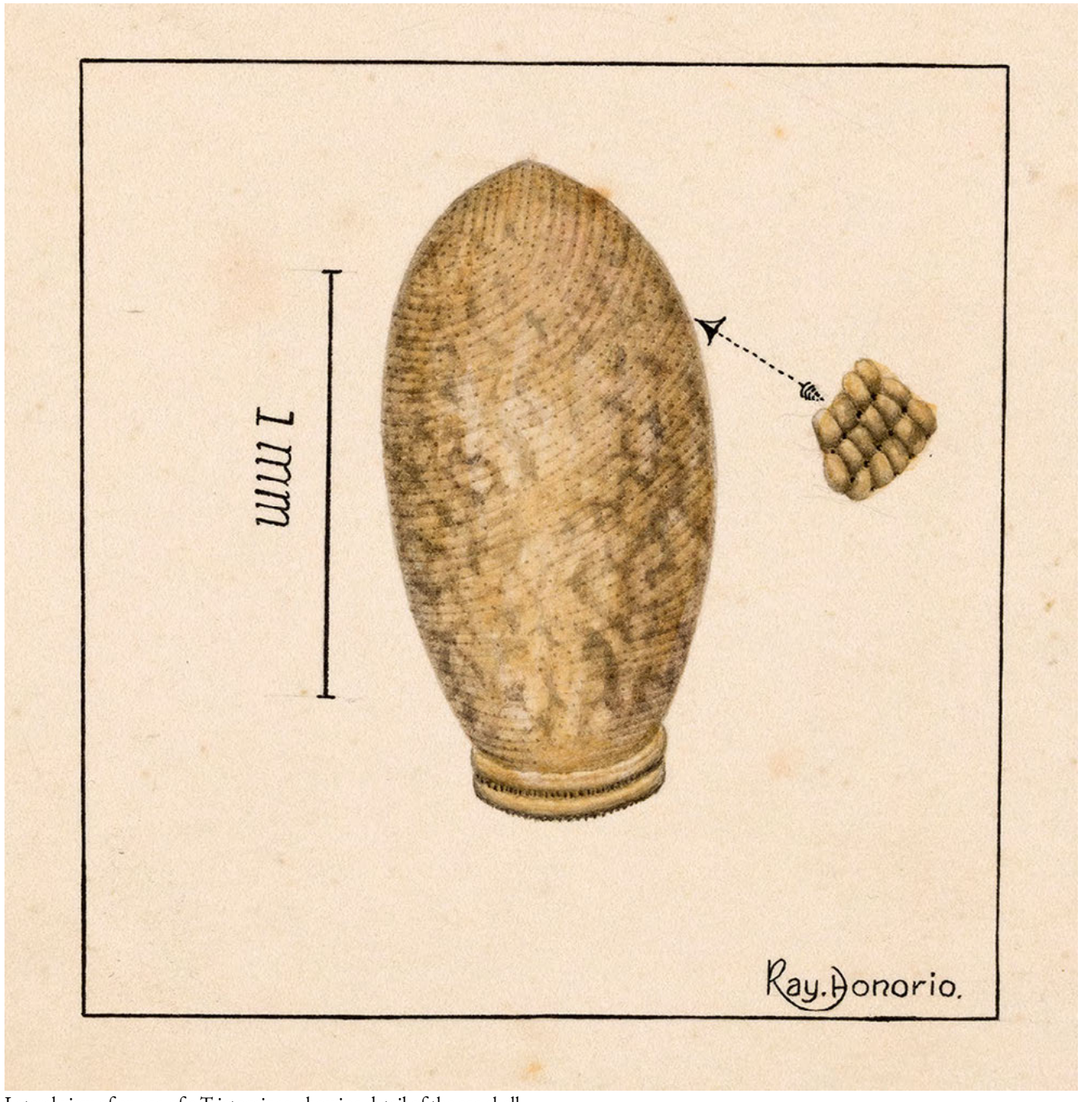
Eutriatoma nigromaculata Lent & Pifano, 1939, synonymous with *Triatoma nigromaculata* (Stål, 1872); profile of head of male
1939
India ink (diluted); 19cm x 11cm



Phloeophana longirostris (Spinola, 1837); dorsal view of female
N.d.
India ink; 33cm x 20cm

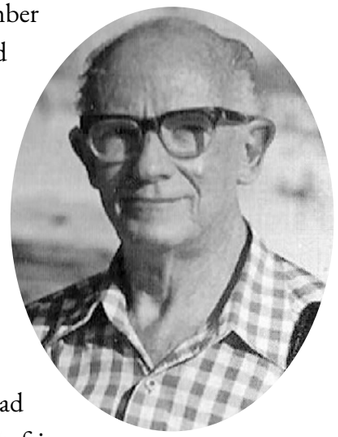


Ventral view of a lice of the sub-order Anoplura
N.d.
India ink and watercolor; 24cm x 16cm

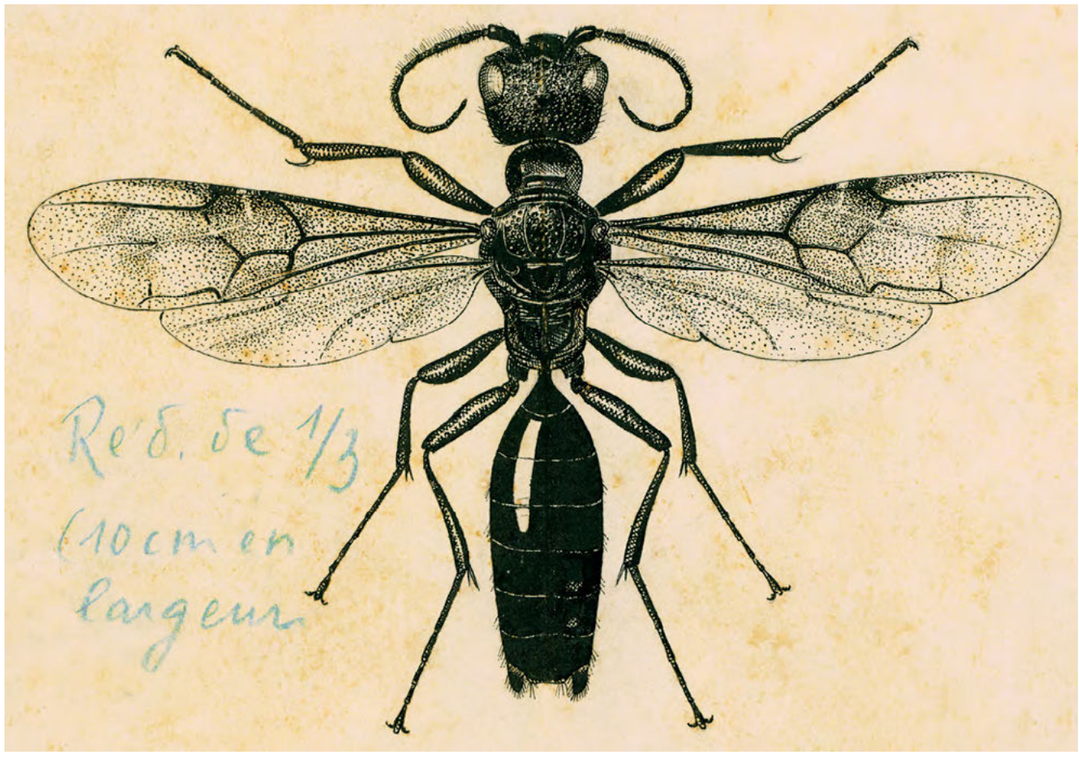


Lateral view of an egg of a Triatominae, showing detail of the egg shell
N.d.
India ink and watercolor; 10cm x 10cm

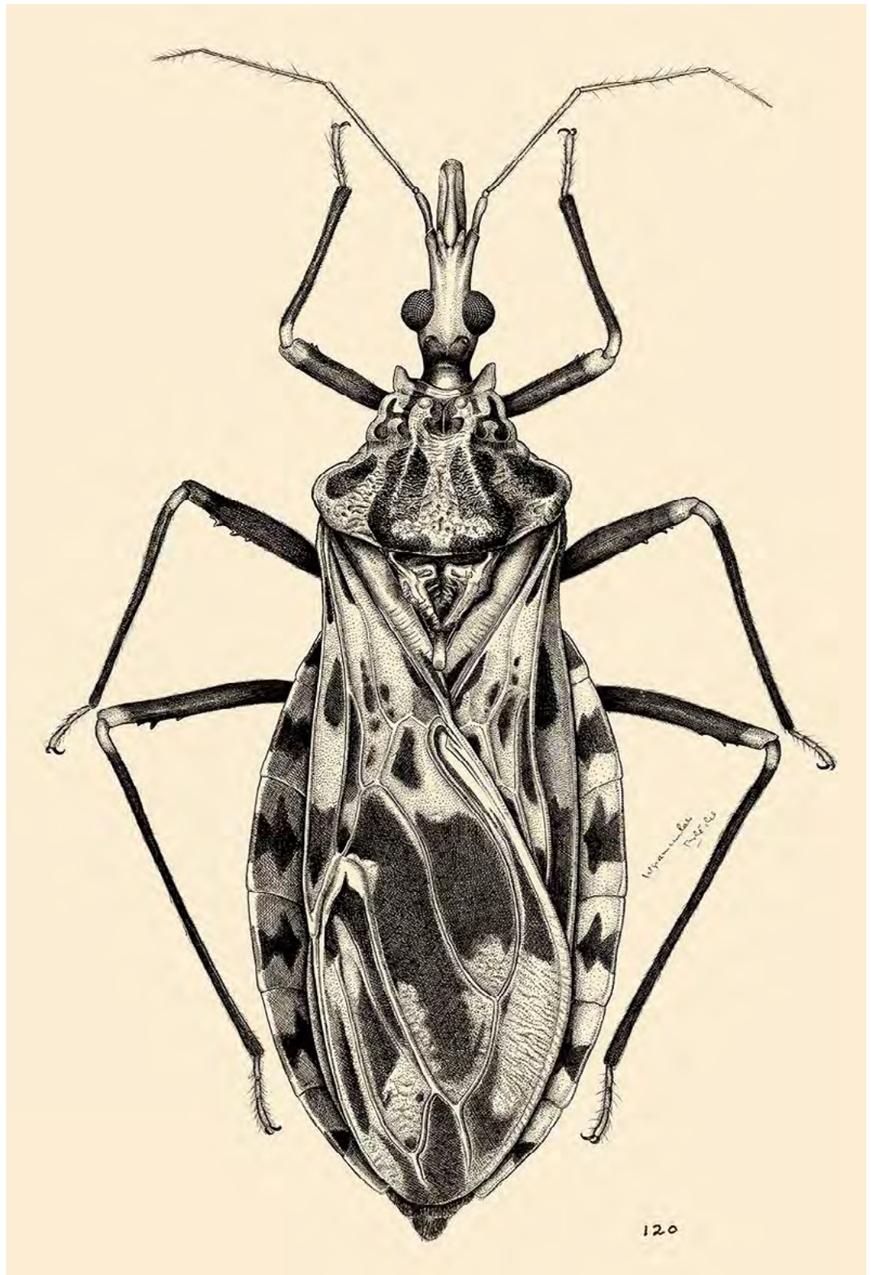
ROGER PIERRE HIPOLYTE ARLÉ



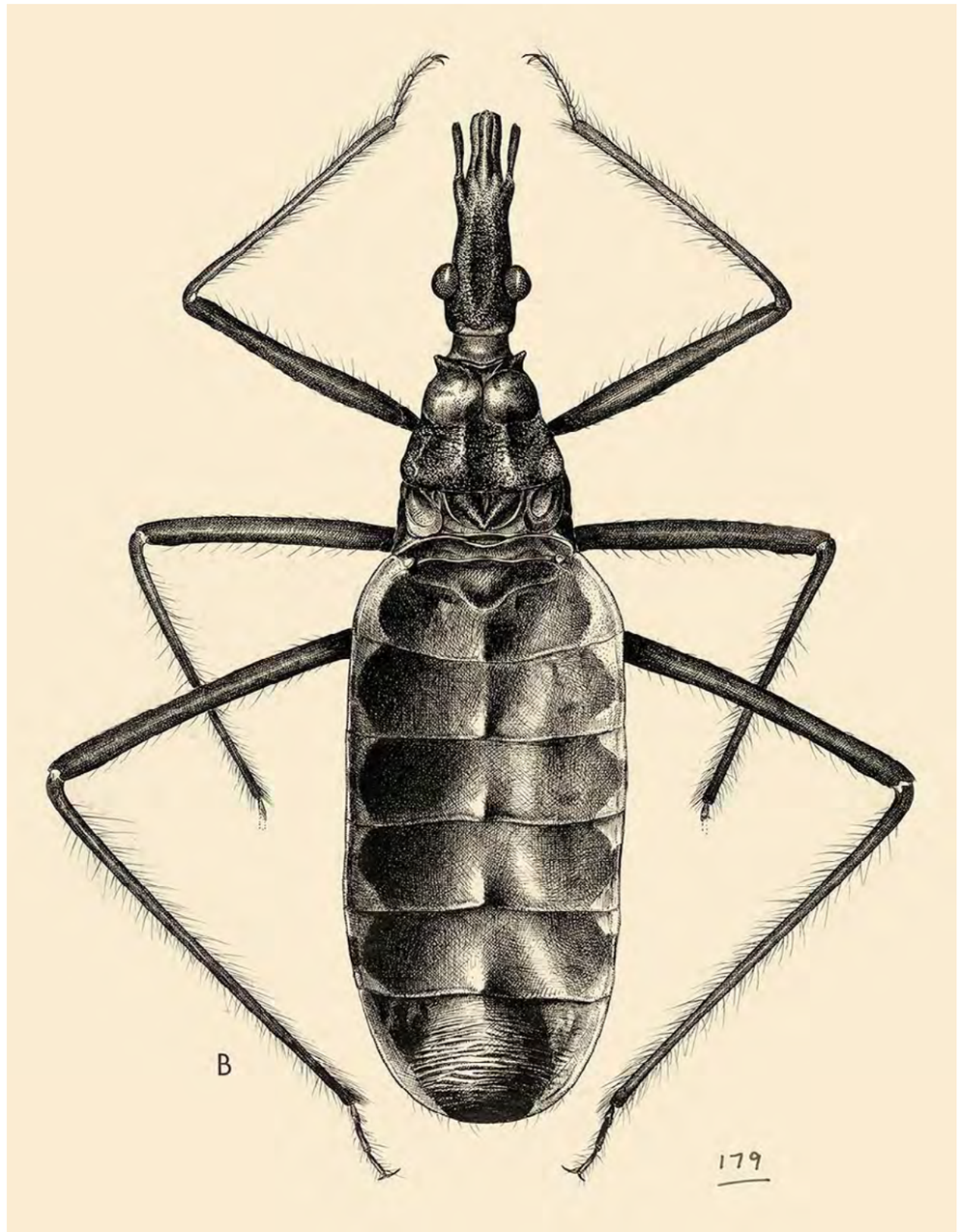
Roger Pierre Hipolyte Arlé was born on September 7, 1909, in Joigny, France. In 1930 he completed courses in natural science and in general entomology and systematics, taught by René Jeannel at the Faculty of Science in Paris. From 1929 to 1932 he was an intern at the Entomology Laboratory of the National Museum of Natural History in Paris and took part in a scientific mission to northern Africa to collect Hymenoptera. He moved to Brazil in 1932, where he first designed jewels, a craft he had learned in France after graduating in technical drafting from Liceu Voltaire. He then interned at the Zoology Division of the National Museum, in Rio de Janeiro. During this time, he worked as a sketch artist with Professor Cândido de Mello Leitão, who was researching Arachnida and Hymenoptera. His drawings can also be found illustrating the publications of other researchers. At the museum, he specialized in microscopic soil arthropods, especially of the order Collembola. In 1938 he took part in IOC researcher Lauro Travassos's first scientific expedition, to Mato Grosso, where he collected material for the institution's Collembola collection. In 1939 he earned a post as a naturalist with the Brazilian Ministry of Education and Health, from which he stepped down two years later. He then returned to the National Museum, where he remained until 1962, when Brazil's National Research Council asked him to help with the scientific work being done at the Emílio Goeldi Museum of Pará, in the city of Belém, Par. In the 1970s and 1980s, he taught undergraduate and graduate classes on the ecology of soil insects and mesofauna. Over the course of his career, he described new genera and species for the orders Hymenoptera, Collembola, and Orthoptera. He died on December 7, 2001.



Pristocera gigantea Arlé, 1930; dorsal view of male. Specimen captured in Lambaréné, Gabon
1930
India ink; 21cm x 13.5cm

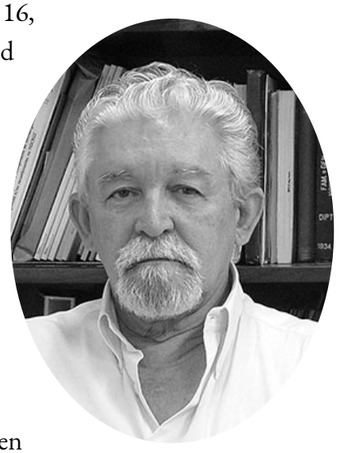


Eutriatoma nigromaculata Lent & Pifano, 1939; synonymous with *Triatoma nigromaculata* (Stål, 1872); dorsal view of female
1939
India ink; 45cm x 29.5cm

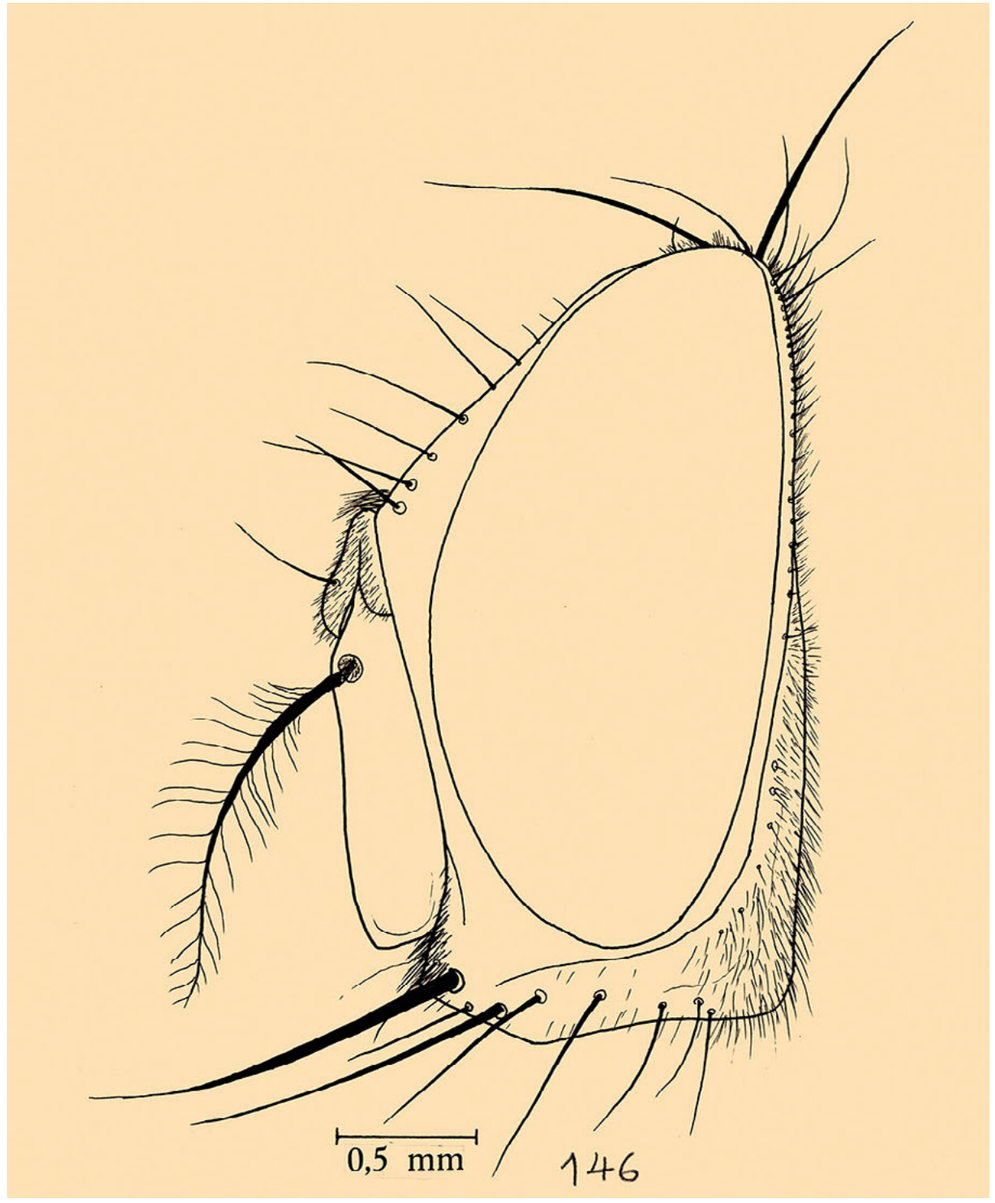


Triatomaptera porteri Neiva & Lent, 1940; synonymous with *Mepraia spinolai* Porter, 1934; dorsal view of male
1940
India ink; 28cm x 21.5cm

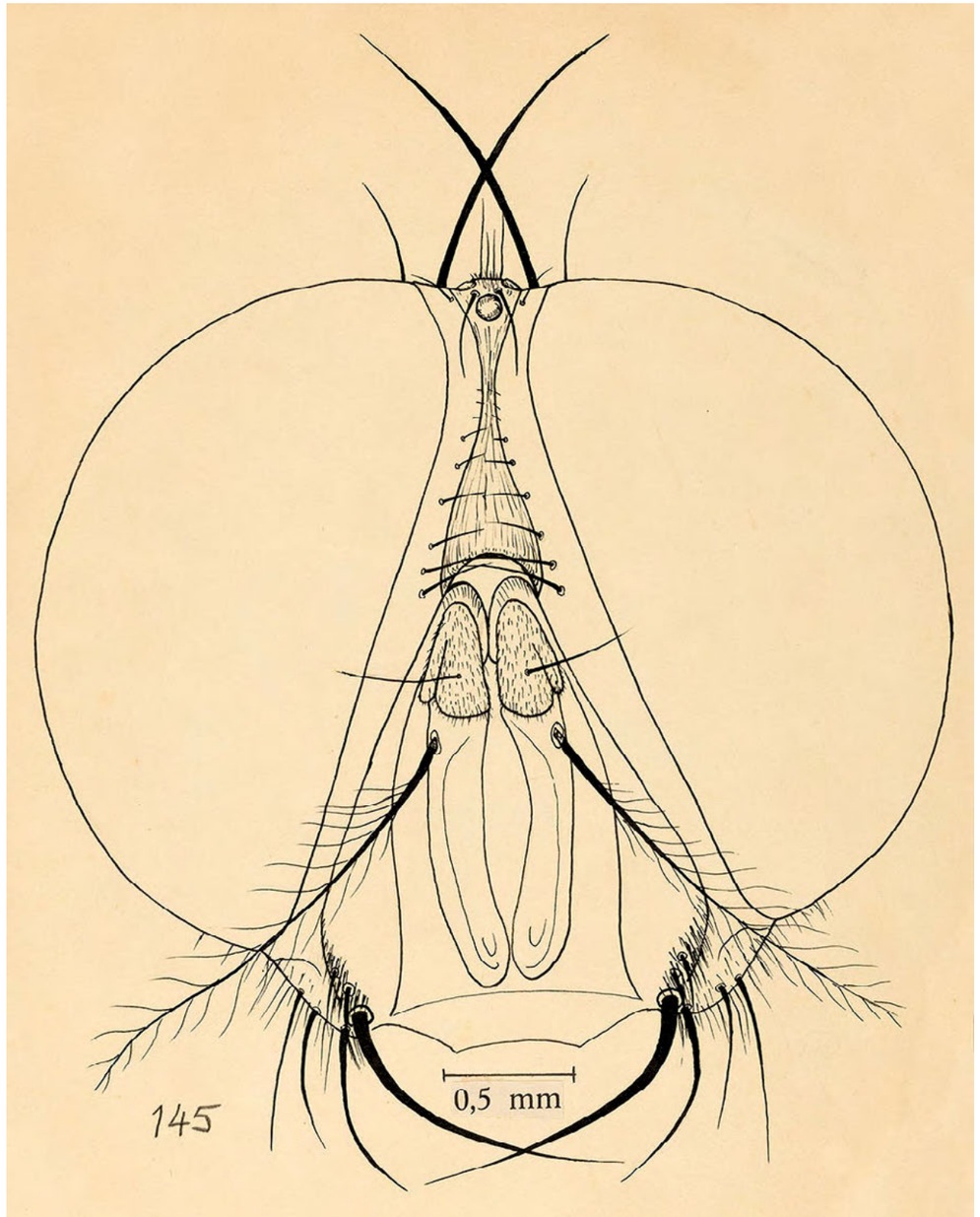
RUBENS PINTO DE MELLO



Rubens Pinto de Mello was born on September 16, 1934, in Petrópolis, Rio de Janeiro. He graduated from the Rural University of Brazil's National School of Veterinary Medicine in 1961. While in school, he researched Diptera (flies) of the family Calliphoridae as an IOC fellow under the supervision of Hugo de Souza Lopes, who also served as Mello's advisor for both his master's (1967) and doctorate (1989). In 1962, Mello was appointed to the post of veterinarian with the Ministry of Agriculture and was first assigned to the Institute of Animal Biology. When the ministry underwent restructuring in 1975, he became an animal health inspector at the Rio de Janeiro International Airport, a job he held until he retired, in 1994. In 1964 he passed a public qualifying exam at his alma mater, but did not accept the position since it would have prevented him from holding any other job. In 1969 he became a professor with the Department of Animal Biology at the Federal Rural University of Rio de Janeiro's Institute of Biology, a post he held until 1991. In 1972 he and his colleague Hugo Edison Barboza de Rezende founded the Postgraduate Course in Parasitology within the same department. In 1999 he received the title of professor emeritus. Mello taught at other institutions as well, including Plínio Leite University, Grande Rio University, and Estácio de Sá University. In 1987 he began collaborating with the IOC Entomology Department at the invitation of José Jurberg and also with the Biology Department, where he worked alongside Hugo de Souza Lopes. Leônidas Deane later invited him to head the Diptera Laboratory, which he did from 1991 to 2006. He continues to research Diptera and teach at the IOC, where he has maintained ties throughout his life.



Huascaromusca grajauensis Mello, 1967; profile of head of male
1967
India ink; 25cm x 20cm



Huascaromusca grajauensis Mello, 1967; front view of head of male
1967
India ink; 29cm x 21cm

OTHER MANGUINHOS SCKETCH ARTISTS

ANTONIO RODRIGUES LEAL

Antonio Rodrigues Leal joined the IOC in 1926, having previously worked as a sketch artist with the National Museum's Anthropology and Ethnography Section. In 1931 he moved to the post of sketch artist at the institute, where he collaborated with such researchers as Walter Oswaldo Cruz, Carlos Bastos Magarinos Torres, Eurico Villela, Wladimir Lobato Paraense, Genésio Pacheco da Veiga, Rita Alves de Almeida Cardoso, A. Penna de Azevedo, José de Castro Teixeira, and Gobert Araújo Costa, particularly in the fields of anatomic pathology and parasitology. He retired in 1943, and died on October 10, 1949, in Rio de Janeiro.

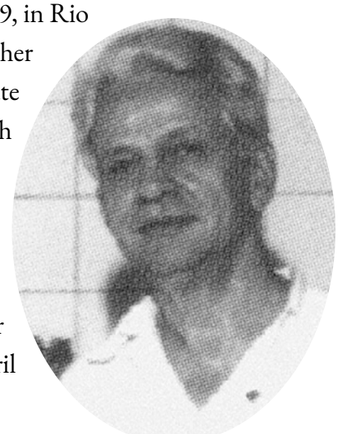
CELIO ALBANO

Celio Albano was born on August 31, 1930. He joined the IOC in 1954 as a sketch artist. In 1961 he was temporarily transferred *ex officio* to the Ministry of Health's Works Division.

EDITH DA FONSECA NOGUEIRA PENIDO

Edith da Fonseca Nogueira Penido was born on April 9, 1912, in Rio de Janeiro. She started working at the IOC in 1930 as a volunteer at the laboratory headed by Olympio Oliveira Ribeiro da Fonseca, from whom she earned praise for the quality and quantity of microscopic and macroscopic parasitological drawings done under his supervision. In 1934 she joined the staff as a sketch artist and then did drawings of crustaceans, tics, helminths, and protozoans for the researchers Henrique Aragão, Lejeune de Oliveira, Flávio da Fonseca, and Carlos Bastos Magarinos Torres, among others. She was also a botanical painter and illustrator and in 1950 became responsible for the area of painting, drawing, and calligraphy with the institute's Scientific Documentation Service. In 1954 she married the physician João Carlos de Nogueira Penido, who was a researcher at the IOC. She retired in 1964

JOEL SAMPAIO ANTUNES



Joel Sampaio Antunes was born on July 12, 1919, in Rio de Janeiro. He worked at the IOC as a cartographer from 1960 to 1961 and then rejoined the institute in 1969 as a technical sketch artist. Together with Walter Alves da Silva, he was responsible for the cartography in *Atlas florestal do Brasil* (Forest atlas of Brazil; Rio de Janeiro, Ministério da Agricultura, 1966), edited by Henrique Pimenta Veloso, an IOC researcher and member of the Federal Forestry Council. He died on April 30, 1995, in Rio de Janeiro.

JOSÉ EDUARDO PRADO

José Eduardo Prado was born on March 29, 1951, in Niterói, Rio de Janeiro. In 1991 he received his bachelor's degree in architecture and urban planning from Gama Filho University. In 1976 he became a staff technical sketch artist at the IOC, where he worked at the Malacology Laboratory until retiring in 2013. While there, he did illustrations for scientific papers by the laboratory's researchers and students, including Wladimir Lobato Paraense's study of fresh water mollusks of medical interest.

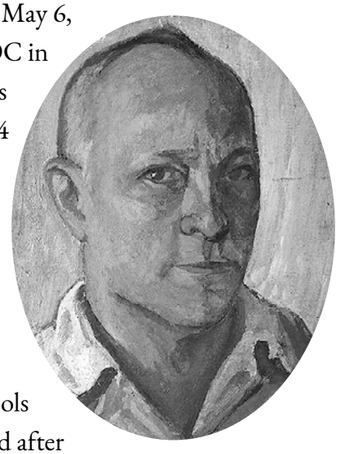
JOSÉ TAVARES DE LACERDA SOBRINHO

José Tavares de Lacerda Sobrinho joined the IOC in 1940 as a sketch artist and left his post in 1943.

LUIZ AUGUSTO CORDEIRO

Luiz Augusto Cordeiro was hired by the IOC in 1917 as a sketch artist aide and in 1919 became a junior sketch artist aide. He collaborated with César Ferreira Pinto, Lauro Travassos, Olympio Oliveira Ribeiro da Fonseca, and Cássio Miranda, among other researchers at the institute, particularly in the fields of helminthology and protozoology. During the 1910s he took part in the General Fine Arts Exhibition in Rio de Janeiro, where he painted some of the editions. He died on November 7, 1919, in Rio de Janeiro.

RAYMUNDO PORCIÚNCULA DE MORAES



Raymundo Porciúncula de Moraes was born on May 6, 1892, in São Bento, Maranhão. He joined the IOC in 1920 as a junior sketch artist aide. In 1931 he was appointed to the post of sketch artist and in 1934 became a head sketch artist. He collaborated with such researchers as Henrique Aragão, Lauro Travassos, Octavio de Magalhães, Aroeira Neves, and Emmanuel Dias, particularly in the fields of protozoans, helminths, and fungi. He left the IOC in 1938 to devote himself solely to his work as an art teacher at vocational high schools in the Federal District, a position he had obtained after passing a qualifying exam in 1933. He also taught classes at the National Fine Arts School and at his own studio. As a recognized art critic, poet, and painter, he took part in international, national, and regional fine arts salons from the 1920s to 1980s, taking home various prizes. He was a member of the Brazilian Fine Arts Society and the Brazilian Academy of Fine Arts. The latter association recognized him with a prize for the sum of his work in 1963. He died on November 14, 1981, in Rio de Janeiro.

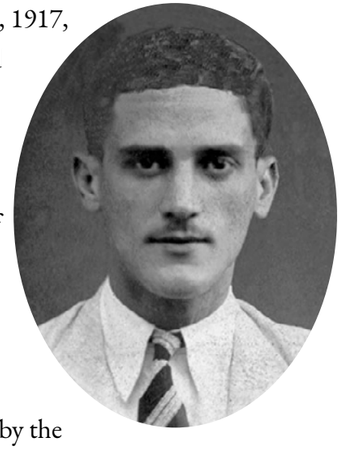
RENÉE FERREIRA DE MELO

Renée Ferreira de Melo was born on April 23, 1934, in Maceio, Alagoas. She joined the IOC in 1955 as a junior sketch artist aide. She made graphs and did drawings of cultures, histological cross-sections, dermatological lesions, and other items of biological interest for IOC researchers. She retired in 1977.

WALDIR DOS SANTOS BOTELHO

Waldir dos Santos Botelho joined the IOC in 1952 as a sketch artist and was discharged from his post that same year.

WALTER ALVES DA SILVA



Walter Alves da Silva was born on December 26, 1917, in Rio de Janeiro. From 1937 to 1943, he served as a sketch artist for the following agencies: the Yellow Fever Service, an agency created under an agreement with the Rockefeller Foundation (1937-1939); the Malaria Service of the Northeast (1938-1941); and the National Yellow Fever Service (1942-1943). He was also a cartographer for the last of the agencies (1944-1956) until transferring to the National Department of Rural Endemic Diseases. Hired by the IOC in 1960 as a cartographer, he was definitively transferred the following year. In 1964, he took over the head of the Documentation and Museums Sector of the Documentation Service, which was part of the Teaching and Documentation Division and in 1968 he was reclassified as a sketch artist. Together with Joel Sampaio Antunes, he was responsible for the cartography in *Atlas florestal do Brasil* (Forest atlas of Brazil; Rio de Janeiro, Ministério da Agricultura, 1966), edited by Henrique Pimenta Veloso, an IOC researcher and member of the Federal Forestry Council. He retired in 1977, and died on January 2, 1999, in Rio de Janeiro.

BIBLIOGRAPHY

ALBERTO Federman. *In*: ENCICLOPÉDIA Itaú Cultural de arte e cultura brasileiras. São Paulo: Itaú Cultural, 2020. Verbete da Enciclopédia. http://enciclopedia.itaucultural.org.br/pessoa287896/alberto-federman (accessed June 15, 2020).

ALMANAK administrativo, mercantil, e industrial do Rio de Janeiro. Almanak Laemmert. Rio de Janeiro: Companhia Tipográfica do Brasil, 1924-1925.

ALMEIDA, Anna Beatriz de Sá *et al*. (org.). *Memória das coleções científicas do Instituto Oswaldo Cruz da Fundação Oswaldo Cruz*: acervo de depoimentos. Rio de Janeiro: Fiocruz, 2001.

ALMEIDA, Jayme Lins de. *Longistriata castrosilvai* n. sp., nematódeo parasito de *Coendu villosus* Cuv. (Rodentia). *Memórias do Instituto Oswaldo Cruz*, Rio de Janeiro, v.29, n.1, p.199-202, 1934. https://www.scielo.br/j/mioc/a/hHxVB67V3XWF4fjmRx3GtKc/?lang=pt (accessed September 30, 2021).

ANTONIO Rodrigues Leal (falecimento). *A Noite*, Rio de Janeiro, ano 38, n.13.306, p.9, 11 out. 1949. Comunicados Fúnebres. http://memoria.bn.br/DocReader/348970_04/59982 (accessed August 25, 2020).

ANTONIO Viegas Pugas (aviso de falecimento). *Jornal do Brasil*, Rio de Janeiro, ano 81, n.257, p.22, 4 fev. 1972. Avisos Religiosos.

BATISTELLA, Renata Reis Cornelio. A *"grande família" do Instituto Oswaldo Cruz*: a contribuição dos trabalhadores auxiliares dos cientistas no início do século XX. 2018. 275 f. Tese (Doutorado em Educação) – Faculdade de Educação, Universidade Federal Fluminense, Niterói, 2018. https://www.epsjv.fiocruz.br/sites/default/files/files/Tese-Renata-ReisCornelio-Batistella-versão-final-após-banca-examinadora(1).pdf (accessed April 29, 2021).

CALAÇA, Carlos Eduardo. Vivendo em Manguinhos: a trajetória de um grupo de cientistas no Instituto Oswaldo Cruz. *História, Ciências, Saúde – Manguinhos*, Rio de Janeiro, v.7, n.3, p.587-606, nov. 2000/fev. 2001. https://www.scielo.br/j/hcsm/a/Br45JTDxLKc7Gj5KVW9GdDP/?lang=pt (accessed July 22, 2020).

CAMPANHA NACIONAL DE APERFEIÇOAMENTO DE PESSOAL DE NÍVEL SUPERIOR. *Estabelecimentos de ensino superior*. Rio de Janeiro, 1960.

CAMPOFIORITO, Quirino. Falecimento de Luiz Kattenbach. *O Jornal*, Rio de Janeiro, ano 33, n.10.175, p.7, 7 nov. 1953. Seção Artes Plásticas. http://memoria.bn.br/docreader/DocReader.aspx?bib=110523_05&pagfis=24853 (accessed March 20, 2019).

COURA, José Rodrigues; FERREIRA, Luiz Fernando; PARAENSE, Wladimir Lobato (org.). *Centenário do Instituto Oswaldo Cruz*: 1900-2000. Rio de Janeiro: Fiocruz, 2000. http://www.fiocruz.br/ioc/media/centenario_IOC_livro.pdf (accessed June 26, 2018).

D'AGOSTINI, Silvana *et al*. Joaquim Franco de Toledo – o ilustrador científico. *Páginas do Instituto Biológico*, São Paulo, v.8, n.1, p.1-10, jan./fev. 2012. http://www.biologico.sp.gov.br/uploads/docs/pag/v8_1/dagostini.pdf (accessed August 27, 2020).

DIAS, Ezequiel Caetano. *O Instituto Oswaldo Cruz*: resumo histórico (1899-1918). Rio de Janeiro: Instituto Oswaldo Cruz, 1918.

ENTOMOLOGICAL SOCIETY OF AMERICA. *Marcos Kogan, ESA fellow (2016)*. https://www.entsoc.org/fellows/kogan (accessed October 10, 2019).

FÁBIO Leoni Werneck. *Jornal do Commercio*, Rio de Janeiro, ano 134, n.122, p.18, 26 fev. 1961. 3° Caderno. http://memoria.bn.br/DocReader/364568_15/7927 (accessed November 23, 2020).

FONSECA FILHO, Olympio da. A *escola de Manguinhos*: contribuição para o estudo do desenvolvimento da medicina experimental no Brasil. São Paulo: EGTR, 1974.

FREITAS, J.F. Teixeira de. Revisão da família Mesocoeliidae Dollfus, 1933: (Trematoda). *Memórias do Instituto Oswaldo Cruz*, Rio de Janeiro, v.61, n.2, p.177-311, ago. 1963. https://www.scielo.br/j/mioc/a/tNwSBSSdwVwfsZjDqvtN5Wn/?format=pdf&lang=pt (accessed September 10, 2021).

FUNDAÇÃO OSWALDO CRUZ. Casa de Oswaldo Cruz. *Memória de Manguinhos*: acervo de depoimentos. Rio de Janeiro: Casa de Oswaldo Cruz, 1991.

FUNDAÇÃO OSWALDO CRUZ. Casa de Oswaldo Cruz. Departamento de Arquivo e Documentação. *Arquivo Oswaldo Cruz*: inventário analítico. Rio de Janeiro: Fiocruz, 2003.

FUNDAÇÃO OSWALDO CRUZ. Casa de Oswaldo Cruz. Departamento de Arquivo e Documentação. *Fundo Instituto Oswaldo Cruz*: inventário dos documentos das coleções científicas. Rio de Janeiro: Fiocruz, 2001.

FUNDAÇÃO OSWALDO CRUZ. Casa de Oswaldo Cruz. Departamento de Arquivo e Documentação. *Fundo Leônidas Deane*: inventário analítico. Rio de Janeiro: Fiocruz, 1999.

HARDY, D. Elmo. Dr. Martin L. Aczél, 1906-1958. *Proceedings of the Entomological Society of Washington*, Washington, D.C., v.61, n.3, p.139-140, 1959.

HERKENHOFF, Paulo. *Eliseu Visconti*: moderno antes do modernismo. Projeto Eliseu Visconti. https://eliseuvisconti.com.br/textos/paulo-herkenhoff (accessed February 11, 2019).

IN MEMORIAM: Manoel de Castro e Silva. *Memórias do Instituto Oswaldo Cruz*, Rio de Janeiro, v.28, n.4, p.1, 1934. https://www.scielo.br/pdf/mioc/v28n4/tomo28(f4)_I.pdf (accessed April 5, 2019).

JURBERG, Claudia. Biobibliografia: Rubens Pinto de Mello. *Entomología y Vectores*, Rio de Janeiro, v.10, n.3, p. 287-306, 2003.

JURBERG, Claudia; ARLÉ, Monique. Roger Pierre Hipolyte Arlé (1909-2001). *Entomología y Vectores*, Rio de Janeiro, v.9, n.1, p.1-13, 2002.

JURBERG, José *et al*. *Atlas iconográfico dos triatomíneos do Brasil (vetores da doença de Chagas)*. Rio de Janeiro: Instituto Oswaldo Cruz, 2017.

JURBERG, José *et al*. *Uma iconografia dos triatomíneos (Hemiptera: Reduviidae)*. Rio de Janeiro: IRD Editions: Editora Gama Filho, 2005.

LACAZ, Carlos da Silva. A tribute from the Tropical Medicine Institute of São Paulo in memory of Leônidas de Mello Deane and his wife Maria José von Paumgartten Deane. *Revista do Instituto de Medicina Tropical de São Paulo*, São Paulo, v.40, n.4, p.267-268, 1998. https://www.scielo.br/pdf/rimtsp/v40n4/40n4a13.pdf (accessed August 10, 2020).

LEAL, Armando Santos. Joaquim Franco de Toledo. *Arquivos de Botânica do Estado de São Paulo*, São Paulo, v.3, n.1, p.45-49, 1952.

LENT, Herman. Nova espécie de "*Triatoma*" da região oriental (Hemiptera, Reduviidae). *Revista Brasileira de Biologia*, Rio de Janeiro, v.13, n.4, p.315-319, 1953.

LENT, Herman. Desenvolvimento da entomologia no Instituto Oswaldo Cruz. Discurso na Academia Brasileira de Ciências ao receber o prêmio Costa Lima. *Ciência e Cultura*, São Paulo, v.24, n.12, p.1192-1200, dez. 1972. http://memoria.bn.br/DocReader/003069/11997 (accessed August 2, 2020).

LENT, Herman; WYGODZINSKY, Pedro. Revision of the Triatominae (Hemiptera, Reduviidae), and their significance as vectors of Chagas' disease. *Bulletin of the American Museum of Natural History*, New York, v.163, p.123-520, 1979.

LUIS Kattenbach. *In*: DATABASE of scientific illustrators 1450-1950. Stuttgart: Section for History of Science and Technology/University of Stuttgart, s.d. https://dsi.hi.uni-stuttgart.de/index.php?table_name=dsi&function=details&where_field=id&where_value=9281 (accessed March 15, 2019).

LUIZ Cordeiro. *In*: ENCICLOPÉDIA Itaú Cultural de arte e cultura brasileiras. São Paulo: Itaú Cultural, 2020. Verbete da Enciclopédia. http://enciclopedia.itaucultural.org.br/pessoa272444/luiz-cordeiro (accessed August 16, 2020).

LUIZ Kattenbach. *In*: ENCICLOPÉDIA Itaú Cultural de arte e cultura brasileiras. São Paulo: Itaú Cultural, 2020. Verbete da Enciclopédia. http://enciclopedia.itaucultural.org.br/pessoa284297/luiz-kattenbach (accessed August 16, 2020).

LUTZ, Adolpho. Tabanidas do Brazil e de alguns estados vizinhos. *Memórias do Instituto Oswaldo Cruz*, Rio de Janeiro, v.5, n.2, p.142-191, 1913. Disponível em: https://www.scielo.br/j/mioc/a/cfR8HZwC63dNxjp8bZbZjTm/?lang=pt&format=pdf. (accessed July 12, 2021).

MENDES, Adilson; MONTEIRO, Paulo Henrique Nico (org.). *O Brasil de Carlos Rodolpho Fischer*. São Paulo: Instituto Butantan, 2017. https://repositorio.butantan.gov.br/handle/butantan/3109 (accessed February 2, 2022).

MORREU o pintor Luiz Cordeiro. *A Rua*, Rio de Janeiro, ano 6, n.306, p.4, 8 nov. 1919. Ecos de Arte. http://memoria.bn.br/DocReader/236403/8200 (accessed November 20, 2020).

OLIVEIRA, Ricardo Lourenço de; CONDURU, Roberto. Nas frestas entre a ciência e a arte: uma série de ilustrações de barbeiros do Instituto Oswaldo Cruz. *História, Ciências, Saúde – Manguinhos*, Rio de Janeiro, v.11, n.2, p.335-384, ago. 2004. https://www.scielo.br/scielo.php?pid=S0104-59702004000200007&script=sci_arttext (accessed March 4, 2020)

OLIVEIRA, Sebastião José de. A vida profissional de Hugo de Souza Lopes. *Memórias do Instituto Oswaldo Cruz*, Rio de Janeiro, v.84, supl.IV, p.III-IV, 1989. https://www.scielo.br/pdf/mioc/v84s4/vol84(fsupl4)_III-V.pdf (accessed September 12, 2019).

PERYASSÚ, Antonio Gonçalves. *Os culicideos do Brazil*. Rio de Janeiro: Typographia Leuzinger, 1908.

PIMENTEL, Luiz Antonio. Luís Kattenbach. *A Tribuna*, Niterói, 26 set. 1970.

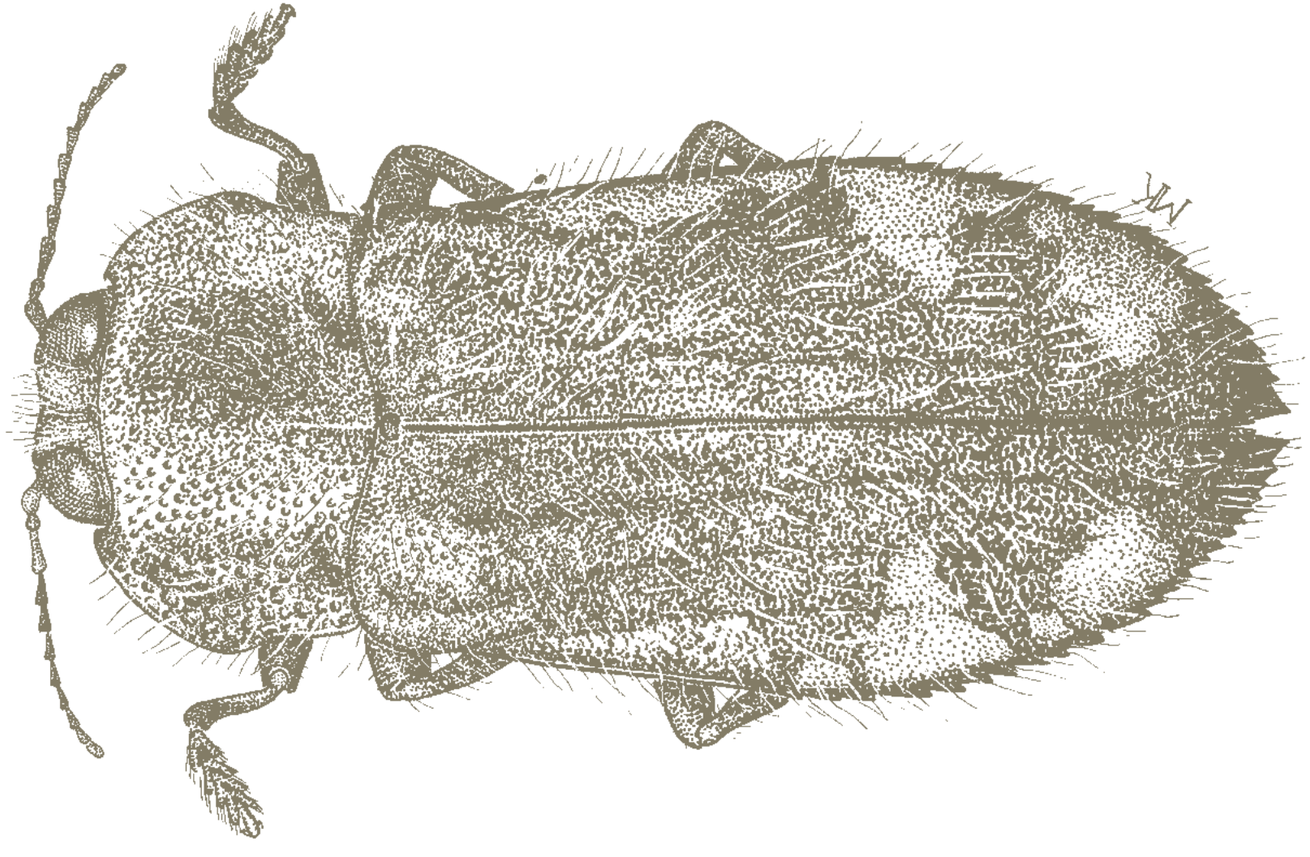
PONTES, Eloy; BONESCHI, Paulo. Seis candidatos ao prêmio de viagem. *O Globo*, Rio de Janeiro, p.8, 16 ago. 1926. Edição extraordinária "O 'Salão' – rápida viagem pela galeria dos concorrentes". http://www.dezenovevinte.net/egba/index.php?title=O_%22SAL%C3%83O%22_-_R%C3%A1pida_viagem_pela_galeria_dos_concorrentes._O_Globo_%28Edi%C3%A7%C3%A3o_extraordin%C3%A1ria%29%2C_Rio_de_Janeiro%2C_16_ago._1926%2C_p._8 (accessed March 18, 2019).

PORCIÚNCULA de Moraes.http://porciunculademoraes.com.br/index.html (accessed January 29, 2019).

PORCIÚNCULA de Morais. *In*: ENCICLOPÉDIA Itaú Cultural de arte e cultura brasileiras. São Paulo: Itaú Cultural, 2019. Verbete da Enciclopédia. http://porciunculademoraes.com.br/index.html (accessed January 29, 2019).

PROFESSOR Manoel de Castro Silva. *Correio da Manhã*, Rio de Janeiro, ano 33, n.12.104, p.14, 13 maio 1934. Actos Religiosos. http://enciclopedia.itaucultural.org.br/pessoa24642/porciuncula-de-morais (accessed February 4, 2019).

RANGEL, Marcio Ferreira. *Um entomólogo chamado Costa Lima*: a consolidação de um saber e a construção de um patrimônio científico. 2006. 300f. Tese (Doutorado em História das Ciências e da Saúde) – Casa de Oswaldo Cruz, Fundação Oswaldo Cruz, Rio de Janeiro, 2006. https://www.arca.fiocruz.br/handle/icict/19787 (accessed March 20, 2019).



REBOUÇAS, Márcia Maria; D'AGOSTINI, Silvana; CYTRYNOWICZ, Roney (org.). *Catálogo do acervo de ilustradores científicos do Museu do Instituto Biológico*. São Paulo: Narrativa Um, 2015.

REBOUÇAS, Márcia Maria *et al*. A fotografia como instrumento da pesquisa científica – Alberto Federman. *O Biológico*, São Paulo, v.77, n.2, p.108, 2015. http://www.biologico.agricultura.sp.gov.br/uploads/docs/bio/v77_2/p108.pdf (accessed October 10, 2019).

REGO, Amilcar Arandas et al. Parasitas de anchovas, *Pomatomus saltatrix* (L.) do Rio de Janeiro. *Ciência e Cultura*, São Paulo, v. 35, n.9, p. 1329-1336, 1983.

ROCHA LIMA, H. da. Com Oswaldo Cruz em Manguinhos. *Ciência e Cultura*, São Paulo, v.4, n.1/2, p.15-38, 1952. http://memoria.bn.br/DocReader/docreader.aspx?bib=003069&pasta=ano%20195&pesq=&pagfis=1086 (accessed September 8, 2021).

RUDOLPH Fischer (1886-1955). *In*: BIBLIOTECA virtual em saúde Adolpho Lutz. Rio de Janeiro: Casa de Oswaldo Cruz/Fiocruz, s.d. http://www.bvsalutz.coc.fiocruz.br/html/pt/static/correspondencia/rudolph.php (accessed March 15, 2019).

SANTOS, Paulo Roberto Elian dos; LOURENÇO, Francisco dos Santos. *Guia dos arquivos para a história dos laboratórios do Instituto Oswaldo Cruz*: acervo da Casa de Oswaldo Cruz. Rio de Janeiro: Fiocruz/COC, 2020. http://www.coc.fiocruz.br/images/PDF/guia-de-acervos-historia-laboratorios-ioc.pdf. (accessed June 5, 2021).

SANTOS, Paulo Roberto Elian dos; LOURENÇO, Francisco dos Santos. Leônidas e Maria Deane: a ciência e a vida em comum. *Fiocruz Amazônia*, Manaus, v.4, p.70-74, 2019.

SCHUH, Randall T.; HERMAN, Lee H. Biography and bibliography: Petr Wolfgang Wygodzinsky (1916-1987). *Journal of the New York Entomological Society*, New York, v.96, n.2, p.227-244, 1988. https://www.biodiversitylibrary.org/page/50779406#page/241/mode/1up (accessed February 11, 2019).

SENNA, Terra de. O Luiz Cordeiro está desenhando micróbios no Instituto de Manguinhos. *D. Quixote*, Rio de Janeiro, ano 3, n.105, p.22, 14 maio 1919. Bellas-Artes. http://memoria.bn.br/DocReader/095648/2640 (accessed June 5, 2019).

SHERLOCK, Ítalo A. Dados biográficos sobre o dr. Octávio Mangabeira Filho. *Entomología y Vectores*, Rio de Janeiro, v.6, n.5, p.465-475, 1999.

SILVA, André Felipe Cândido da. *A trajetória científica de Henrique da Rocha Lima e as relações Brasil-Alemanha (1901-1956)*. 2011. 839 f. Tese (Doutorado em História das Ciências e da Saúde) – Casa de Oswaldo Cruz, Fundação Oswaldo Cruz, Rio de Janeiro, 2011. https://www.arca.fiocruz.br/bitstream/icict/17801/2/105.pdf (accessed September 17, 2021).

TRAVASSOS, Lauro. Contribuição para o conhecimento dos Lecitodendriidae do Brasil. *Memórias do Instituto Oswaldo Cruz*, Rio de Janeiro, v.21, n.1, p.189-199, 1928. https://www.arca.fiocruz.br/bitstream/icict/47516/2/Lauro_Travassos_IOC_1928.pdf (accessed September 30, 2021).

TRAVASSOS FILHO, Lauro P. Joaquim Franco de Toledo: curriculum vitae. *Dusenia*, Curitiba, v.3, n.5, p.331-342, 1952.

URUGUAY, Alice Linhares. Luiz Kattenbach. *Jornal do Brasil*, Rio de Janeiro, ano 63, n.258, p.8, 8 nov. 1953. Artes Plásticas. Substituir trecho iluminado por: http://memoria.bn.br/DocReader/030015_07/34906 (accessed June 5, 2019).

USINGER, Robert L. Gordon Floyd Ferris – 1893-1958. *The Pan-Pacific Entomologist*, San Francisco, v.35, n.1, p.1-12, 1959.

WIGGINS, Ira L.; SPIEGELBERG, Frederic; TWITTY, Victor C. Memorial resolution: Gordon Floyd Ferris, 1893-1958. *Microentomology*, Stanford, v.23, n.2, p.72-73, 1958.

WILLINK, Abraham. Biografías zoológicas lilloanas. *Revista de la Sociedad Entomológica Argentina*, San Miguel de Tucumán, v.58, n.3/4, p.3-10, 1999. https://www.biotaxa.org/RSEA/article/viewFile/32472/28865 (accessed January 12, 2019).

ZEIN, Ruth Verde. Acerca da arquitetura mineira (em muitas fotos e alguns breves discursos). *Projeto*, São Paulo, n.81, p.100-118, nov. 1985. http://www.lppm.com.br/sites/default/files/ddab_pdf/images%255Bsmallpdf.com%255D%5Bsmallpdf.com%5D_12.pdf (accessed February 1, 2019).

COLLECTIONS

Arquivo Histórico/Museu Nacional de Belas Artes (Rio de Janeiro, RJ)

Catarina Macedo Lopes (Rio de Janeiro, RJ)

Biblioteca Nacional (Rio de Janeiro, RJ)

Casa de Oswaldo Cruz/Fundação Oswaldo Cruz (Rio de Janeiro, RJ)

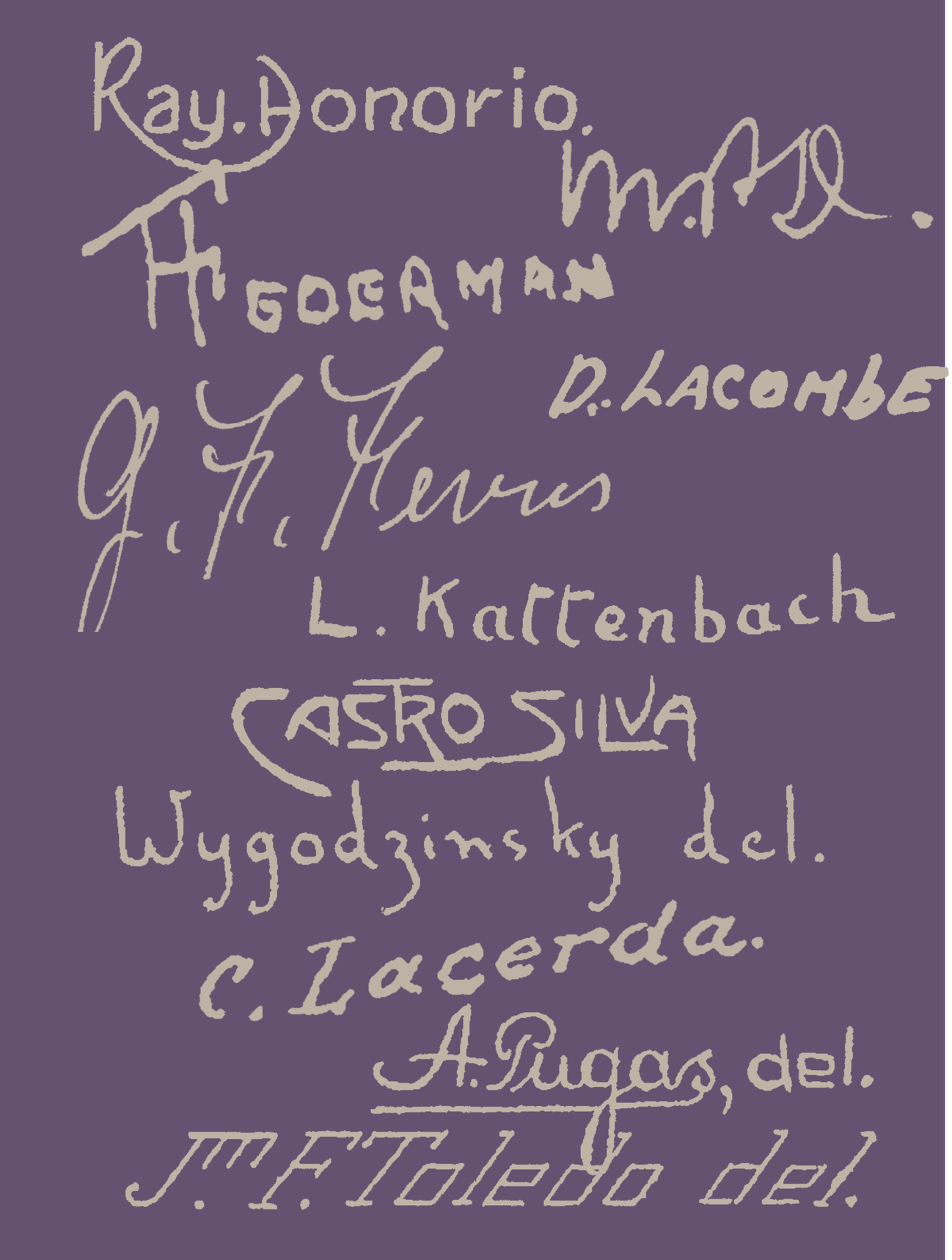
Centro de Ciências da Saúde/Universidade Federal do Rio de Janeiro

Centro de Memória/Instituto Biológico (São Paulo, SP)

Coordenação Geral de Gestão de Pessoas/Fundação Oswaldo Cruz (Rio de Janeiro, RJ)

Instituto de Comunicação e Informação Científica e Tecnológica em Saúde/Fundação Oswaldo Cruz (Rio de Janeiro, RJ)

Instituto de Pesquisas Jardim Botânico do Rio de Janeiro



People name index

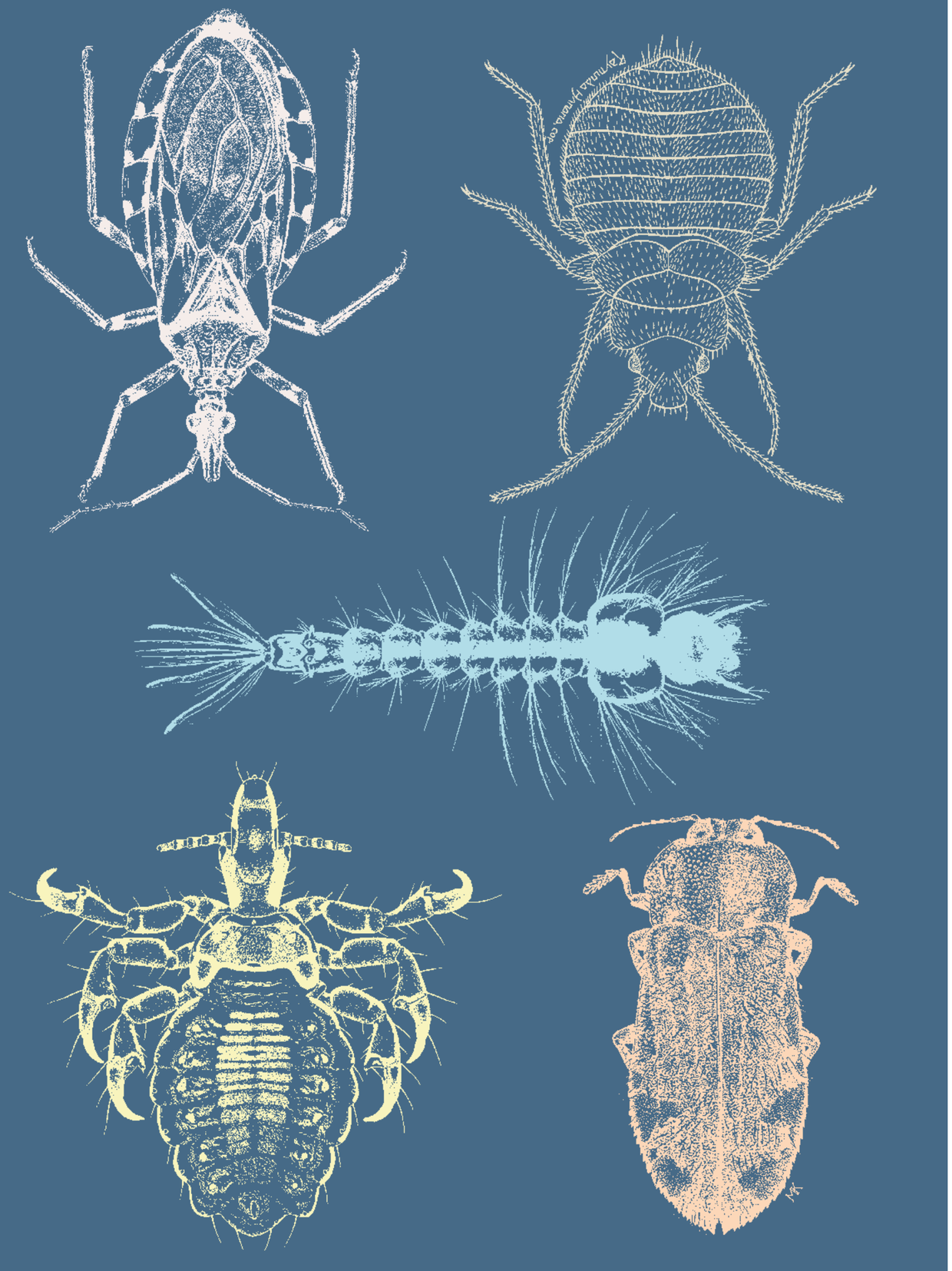


Image credits

The beginnings of the Oswaldo Cruz Institute's Entomological Collection

Adolpho Lutz (right) aboard the vessel *España* on the Paraná River during a scientific expedition to southern South America, 1918

Published in: BIBLIOTECA virtual em saúde Adolpho Lutz. Rio de Janeiro: Casa de Oswaldo Cruz/ Fiocruz, n.d. http://www.bvsalutz.coc.fiocruz.br/lildbi/docsonline/mm/imagens/rio_parana.pdf (accessed June 14, 2019).

Lauro Travassos and Herman Lent in fieldwork

Fonds Oliveira Rodrigues.

Sebastião José de Oliveira, curator of the IOC Entomological Collection

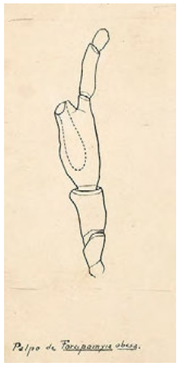
Fonds Sebastião de Oliveira.

The illustrator's legacy

Antonio Viegas Pugas (foreground) and others at the IOC Entomology Section

Fonds Herman Lent.

Illustrations: a stroke of art in science



Drawing of *Forcipomyia obesa* Lima, 1928

Fonds Oswaldo Cruz Institute.

Published in: LIMA, A. da Costa. Ceratopogonineos ectoparasitos de phasmideos. *Memórias do Instituto Oswaldo Cruz*, Rio de Janeiro, v.21, supl.3, p.84-85, 1928. https://www.scielo.br/pdf/mioc/v21s3/tomo21(s3)_84-85.pdf (accessed June 17, 2019).

Photograph of *Forcipomyia obesa* Lima, 1928

Fonds Oswaldo Cruz Institute.

Published in: LIMA, A. da Costa. Ceratopogonineos ectoparasitos de phasmideos. *Memórias do Instituto Oswaldo Cruz*, Rio de Janeiro, v.21, supl.3, p.84-85, 1928. https://www.scielo.br/pdf/mioc/v21s3/tomo21(s3)_84-85.pdf (accessed June 17, 2019).

Scientific drawings in entomology research at the Oswaldo Cruz Institute

Details of the morphology and use of the respiratory syphon of larva of the mosquito *Melanoconion* Theobald, 1903, currently a subgenus of Culex Linnaeus, 1758, 1912

Fonds Oswaldo Cruz Institute.

Cimex limai, now *Propicimex limai* (Pinto, 1927)

Fonds Herman Lent.

Cimex limai, now *Propicimex limai* (Pinto, 1927)

Published in: PINTO, César. *Tratado de parasitologia*: artrópodes parasitos e transmissores de doenças. Rio de Janeiro: Pimenta de Mello, 1930. v.4, tomo 1, p.273.

Cabinet containing insects of the order Lepidoptera from the IOC Entomological Collection, 1953

Fonds Oswaldo Cruz Institute.

Boxes of slides from the IOC Entomological Collection, 1953

Fonds Oswaldo Cruz Institute.

First page of Oswaldo Cruz's article on mosquitoes

Published in: CRUZ, Oswaldo Gonçalves. Contribuição para o estudo dos culicidios do Rio de Janeiro. *Brazil-Medico*, Rio de Janeiro, ano 15, n.43, p.423-426, 1901. http://memoria.bn.br/DocReader/081272/8918 (accessed July 14, 2019).

Antonio Viegas Pugas at his drawing table, observed by Herman Lent and Ademar Guilherme. IOC Entomology Section, 1960s

Fonds Herman Lent.

Microtomus kuntzeni Stichel, 1926

Fonds Herman Lent.

Moorish Pavilion under construction, 1907

Fonds Oswaldo Cruz Institute.

Sketch of the lateral façade of the Moorish Pavilion, 1908

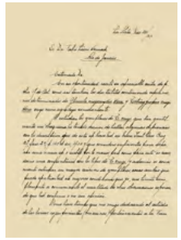
Fonds Oswaldo Cruz Institute.

Drawing room at the Oswaldo Cruz Institute, located in the Moorish Pavilion, 1910s

Published in: DIAS, Ezequiel Caetano. *O Instituto Oswaldo Cruz*: resumo histórico (1899-1918). Rio de Janeiro: Instituto Oswaldo Cruz, 1918. p.37.

Oswaldo Cruz Institute flow chart by illustrator Raymundo Honório Daniel

Published in: PINTO, César. Instituto Oswaldo Cruz. *O Campo*, Rio de Janeiro, ano 6, n.7, p.49-53, jul. 1935.



Letter sent to Fábio Leoni Werneck by Argentine researcher Julio Almanzor Rosas Costa. La Plata, 1933

Fonds Oswaldo Cruz Institute.

Annotations and drawings of the egg, palpus, wing, and leg of a female *Anopheles oswaldoi* (Peryassú, 1922), 1940

Fonds Leônidas Deane.

Manoel de Castro Silva portrayed in a posthumous tribute by his IOC colleague, the illustrator Raymundo Honório Daniel, 1934

Fonds Oswaldo Cruz Institute.

Catalogue of illustrators

Oswaldo Gonçalves Cruz

Oswaldo Cruz at the age of 29, 1901

Fonds Oswaldo Cruz Institute.

Anopheles lutzii Cruz, 1901; egg, dorsal view

Fonds Oswaldo Cruz.

Published in: CRUZ, Oswaldo Gonçalves. Contribuição para o estudo dos culicidios do Rio de Janeiro. *Brazil-Medico*, Rio de Janeiro, ano 15, n.43, p.423-426, 1901. http://memoria.bn.br/DocReader/081272/8920 (accessed July 14, 2019).

Anopheles lutzii Cruz, 1901; egg, lateral view

Fonds Oswaldo Cruz

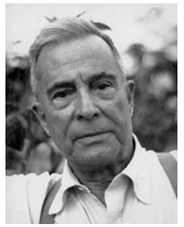
Published in: CRUZ, Oswaldo Gonçalves. Contribuição para o estudo dos culicidios do Rio de Janeiro. *Brazil-Medico*, Rio de Janeiro, ano 15, n.43, p.423-426, 1901. http://memoria.bn.br/DocReader/081272/8920 (accessed July 14, 2019).

Alberto Federman

Centro de Memória do Instituto Biológico archival collection.

Stephanoderes coffeae, now *Hypothenemus hampei* (Ferrari, 1867); pupa, ventral and lateral views

Fonds Arthur Neiva.



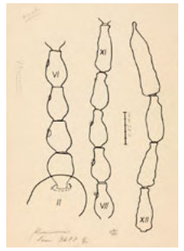
Angelo Moreira da Costa Lima

Fonds Oswaldo Cruz Institute.

Structures of larvae of *Culex* sp

Fonds Oswaldo Cruz Institute.

Published in: LIMA, A. da Costa. Contribuição para o estudo da biolojia dos culicideos: observações sobre a respiração nas larvas. *Memórias do Instituto Oswaldo Cruz*, Rio de Janeiro, v.6, n.1, p.18-34, 1914. https://www.scielo.br/pdf/mioc/v6n1/tomo06(f1)_18-34.pdf (accessed July 29, 2019)..



Forcipomyia fluminensis (unpublished species); antenna of female

Fonds Oswaldo Cruz Institute.

Antonio Viegas Pugas

Antonio Viegas Pugas at his IOC workstation

Fonds Herman Lent.

Phloeophana longirostris (Spinola, 1837); ventral view of male

Fonds José Jurberg.

Published in: LENT, Herman; JURBERG, José. Contribuição ao conhecimento dos Phloeidae Dallas, 1851, com um estudo sobre genitália (Hemiptera, Pentatomoidea). *Revista Brasileira de Biologia*, Rio de Janeiro, v.25, n.2, p.123-144, 1965.

Panstrongylus diasi Pinto & Lent, 1946; dorsal view of male

Fonds Herman Lent.

Published in: LENT, Herman; JURBERG, José. O gênero Panstrongylus Berg, 1879, com um estudo sobre a genitália externa das espécies (Hemiptera, Reduviidae, Triatominae). *Revista Brasileira de Biologia*, Rio de Janeiro, v.35, n.3, p.379-438, 1975.

Panstrongylus tupynambai Lent, 1942; dorsal view of male

Fonds Herman Lent.

Published in: LENT, Herman; JURBERG, José. O gênero Panstrongylus Berg, 1879, com um estudo sobre a genitália externa das espécies (Hemiptera, Reduviidae, Triatominae). *Revista Brasileira de Biologia*, Rio de Janeiro, v.35, n.3, p.379-438, 1975.

Lateral view of Phlebotominae pupa

Fonds Oswaldo Cruz Institute.

Dorsal view of female *Microtomus conspicillaris* (Drury, 1782)

Fonds Herman Lent.

Dorsal view of female *Triatoma infestans* (Klug, 1834)

Fonds Herman Lent.

Lateral view of egg of *Triatoma vitticeps* (Stål, 1859)

Fonds Herman Lent.

Dorsal view of male *Sirthenea amazona* Stål, 1866

Fonds Herman Lent.

Dorsal view of female *Zelurus armaticollis* (Blanchard, 1852)

Fonds Herman Lent.

Carlos Leal Lacerda

Instituto de Pesquisas Jardim Botânico do Rio de Janeiro archival collection.

Dorsal view of female *Telenomus fariai* Lima, 1927

Fonds Oswaldo Cruz Institute.

Published in: LIMA, A. da Costa. *Insetos do Brasil*: hemípteros. Rio de Janeiro: Escola Nacional de Agronomia, 1940. tomo 2, cap.22, p.210. http://www.ufrrj.br/institutos/ib/ento/tomo02.pdf (accessed April 11, 2019).

Lateral view of female *Angitia (Inareolata) brasiliensis* Costa Lima, 1935

Fonds Oswaldo Cruz Institute.

Published in: LIMA, A. da Costa. Novo ichneumonideo parasito de Papilio anchisiades capys (Hübner). *O Campo*, Rio de Janeiro, v.6, n.6, p.20-21, 1935.

Dorsal views of male and female *Neoneella zikani* Costa Lima, 1942

Fonds Oswaldo Cruz Institute.

Published in: LIMA, A. da Costa. Percevejos de orquídeas (Hemiptera–Miridae–Bryocorinae). *Orquídea*, Rio de Janeiro, v.4, n.3, p.100-109, 1942.

Carlos Rudolf Fischer

Carlos Rudolf Fischer in the Drawing Room in the Moorish Pavilion, 1913

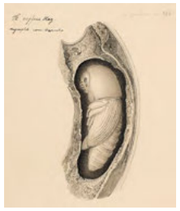
Fonds Oswaldo Cruz Institute

Lateral and dorsal views of female *Stephanoderes coffeae*, now *Hypothenemus hampei* (Ferrari, 1867)

Fonds Arthur Neiva.

Lateral view of male *Stephanoderes coffeae*, now *Hypothenemus hampei* (Ferrari, 1867), projected over female

Fonds Arthur Neiva.



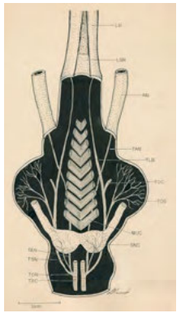
Lateral view of pupa of *Stephanoderes coffeae*, now *Hypothenemus hampei* (Ferrari, 1867)

Fonds Arthur Neiva

Dyrce Lacombe de Almeida

Dyrce Lacombe in his laboratory

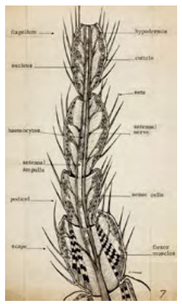
Fonds Dyrce Lacombe.



Distribution of tracheas in the head of *Panstrongylus megistus* (Burmeister, 1835); dorsal view

Fonds Dyrce Lacombe.

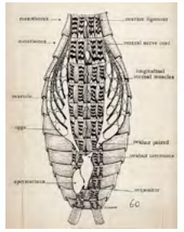
Published in: LACOMBE, Dyrce. Estudos anatômicos e histológicos sobre a subfamília Triatominae (Heteroptera, Reduviidae). Parte XXI. Estudo comparado do sistema traqueal em Triatoma, Panstrongylus e Rhodnius. *Memórias do Instituto Oswaldo Cruz*, Rio de Janeiro, v.63, p.75-105, 1965. https://www.scielo.br/pdf/mioc/v63/tomo63(fu)_078-108.pdf (accessed May 22, 2019).



Internal anatomy of the antenna of *Embolyntha batesi* Maclachlan, 1877

Fonds Dyrce Lacombe.

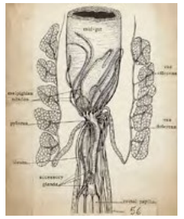
Published in: LACOMBE, Dyrce. Anatomy and histology of Embolyntha batesi Maclachlan, 1877 (Embiidina). *Memórias do Instituto Oswaldo Cruz*, Rio de Janeiro, v.69, n.3, p.331-396, 1971. https://www.scielo.br/pdf/mioc/v69n3/tomo69(f3)_331-396.pdf (accessed June 2, 2019).



Embolyntha batesi Maclachlan, 1877; internal anatomy of female reproductive tract

Fonds Dyrce Lacombe.

Published in: LACOMBE, Dyrce. Anatomy and histology of Embolyntha batesi Maclachlan, 1877 (Embiidina). *Memórias do Instituto Oswaldo Cruz*, Rio de Janeiro, v.69, n.3, p.331-396, 1971. https://www.scielo.br/pdf/mioc/v69n3/tomo69(f3)_331-396.pdf (accessed June 2, 2019).



Embolyntha batesi Maclachlan, 1877; internal anatomy of male reproductive tract

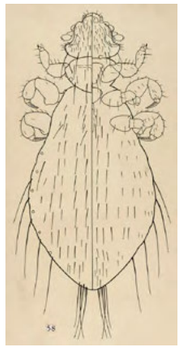
Fonds Dyrce Lacombe.

Published in: LACOMBE, Dyrce. Anatomy and histology of Embolyntha batesi Maclachlan, 1877 (Embiidina). *Memórias do Instituto Oswaldo Cruz*, Rio de Janeiro, v.69, n.3, p.331-396, 1971. https://www.scielo.br/pdf/mioc/v69n3/tomo69(f3)_331-396.pdf (accessed June 2, 2019).

Fábio Leoni Werneck

Fábio Leoni Werneck at the microscope in his laboratory at IOC

Fonds Oswaldo Cruz Institute.



Gyropus limai Werneck, 1948; ventral and dorsal views of male

Fonds Oswaldo Cruz Institute.

Published in: WERNECK, Fábio Leoni. *Os malófagos de mamíferos*. Rio de Janeiro: Edição da Revista Brasileira de Biologia, 1948. parte 1, p.66.

Gyropus limai Werneck, 1948; dorsal aspect of male copulatory apparatus

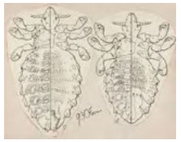
Fonds Oswaldo Cruz Institute.

Published in: WERNECK, Fábio Leoni. *Os malófagos de mamíferos*. Rio de Janeiro: Edição da Revista Brasileira de Biologia, 1948. parte 1, p.67.

Haematopinus suis (Linnaeus, 1758), dorsal aspect of male
Fonds Oswaldo Cruz Institute.

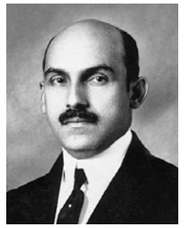
Philandesia townsendi Kellogg & Nakayama, 1914; dorsal and ventral views of female
Fonds Oswaldo Cruz Institute.

Gordon Floyd Ferris
Fonds Oswaldo Cruz Institute.



Haematopinus eurysternus (Nitzsch, 1818); dorsal and ventral views of male and female
Fonds Oswaldo Cruz Institute.
Published in: FERRIS, Gordon Floyd. Contributions toward a monograph of the sucking lice. Part VI. *Stanford University Publications, University Series, Biological Sciences*, California, v.2, n.6, p.419-470, 1933.

Echinophthirus horridus (Olfers, 1816); dorsal and ventral views of female
Fonds Oswaldo Cruz Institute.
Published in: FERRIS, Gordon Floyd. Contributions toward a monograph of the sucking lice. Part VII. *Stanford University Publications, University Series, Biological Sciences*, California, v.2, n.7, p.471-526, 1934.



Henrique da Rocha Lima
Fonds Oswaldo Cruz Institute.

Anopheles lutzii Cruz, 1901; right wing
Fonds Oswaldo Cruz.
Published in: CRUZ, Oswaldo Gonçalves. Contribuição para o estudo dos culicidios do Rio de Janeiro. *Brazil-Medico*, Rio de Janeiro, ano 15, n.43, p.423-426, 1901. http://memoria.bn.br/DocReader/081272/8918 (accessed July 14, 2019).

Anopheles lutzii Cruz, 1901; details of wing structure
Fonds Oswaldo Cruz.
Published in: CRUZ, Oswaldo Gonçalves. Contribuição para o estudo dos culicidios do Rio de Janeiro. *Brazil-Medico*, Rio de Janeiro, ano 15, n.43, p.423-426, 1901. http://memoria.bn.br/DocReader/081272/8918 (accessed July 14, 2019).

Hugo de Souza Lopes
Hugo de Souza Lopes in front of the Moorish Pavilion
Fonds Sebastião de Oliveira.

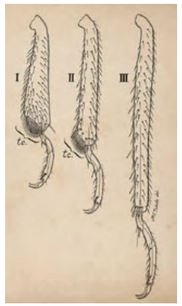
Structures of the head, sternite, genitalia, and leg of fly species of the family Sarcophagidae: *Hardyella littoralis*, now *Sarcophaga littoralis* Johnston & Tiegs 1922; *Bezziola kankauensis*, now *Sarcophaga crinita* Parker, 1917; *Bezziola versattilis*, now *Sarcophaga versatilis* (Lopes, 1959); and *Bezziola fabea*, now *Sarcophaga fabea* (Lopes, 1959)
Fonds Oswaldo Cruz Institute.
Published in: LOPES, Hugo de Souza. A revision of Australia Sarcophagidae (Diptera). *Studia Entomologica*, Rio de Janeiro, v.2, n.1/4, p.33-67, 1959.

Joaquim Franco de Toledo

Published in: LEAL, Armando Santos. Joaquim Franco de Toledo. *Arquivos de Botânica do Estado de São Paulo*, São Paulo, v.3, n.1, p.45-49, 1952.

Lateral views of male and female pupae of *Stephanoderes coffeae*, now *Hypothenemus hampei* (Ferrari, 1867)

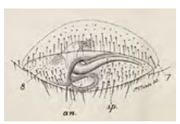
Fonds Arthur Neiva.



Tibia and tarsus of feet of male *Ornithocoris toledoi* Pinto, 1927

Fonds Herman Lent.

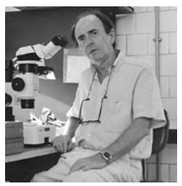
Published in: PINTO, César. *Tratado de parasitologia*: artrópodes parasitos e transmissores de doenças. Rio de Janeiro: Pimenta de Mello, 1930. v.4, tomo 1, p.259.



Genital segment of male *Ornithocoris toledoi* Pinto, 1927

Fonds Herman Lent.

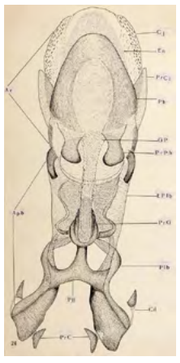
Published in: PINTO, César. *Tratado de parasitologia*: artrópodes parasitos e transmissores de doenças. Rio de Janeiro: Pimenta de Mello, 1930. v.4, tomo 1, p.243.



José Jurberg

José Jurberg at the IOC Entomology Department, Carlos Chagas Pavilion

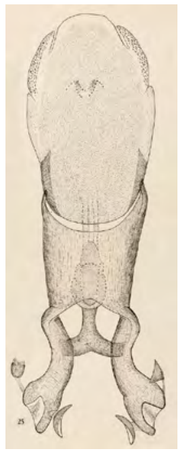
Fonds José Jurberg.



Dorsal view of male genitalia of *Psammolestes coreodes* Bergroth, 1911; extended *phallus*

Fonds José Jurberg.

Published in: LENT, Herman; JURBERG, José. O gênero Psammolestes Bergroth, 1911 com um estudo sobre a genitália das espécies (Hemiptera, Reduvidae, Triatominae). *Revista Brasileira de Biologia*, Rio de Janeiro, v.25, n.4, p.249-376, 1965.



Dorsal view of male genitalia of *Psammolestes tertius* Lent & Jurberg, 1965; extended *phallus*

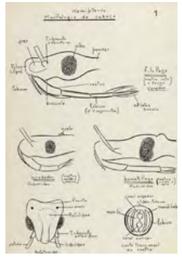
Fonds José Jurberg.

Published in: LENT, Herman; JURBERG, José. O gênero Psammolestes Bergroth, 1911 com um estudo sobre a genitália das espécies (Hemiptera, Reduvidae, Triatominae). *Revista Brasileira de Biologia*, Rio de Janeiro, v.25, n.4, p.249-376, 1965.

Dorsal and ventral views of abdomen of male and female *Microtomus conspicillaris* (Drury, 1782); details of bristles

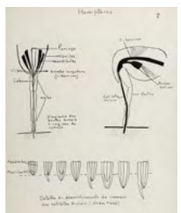
Fonds José Jurberg.

Published in: JURBERG, José. *Contribuição ao estudo comparativo da genitália externa em sub-famílias de Reduviidae (Hemiptera-Heteroptera)*. 1978. 72 f. Dissertação (Mestrado em Zoologia) – Museu Nacional, Universidade Federal do Rio de Janeiro, Rio de Janeiro, 1978. https://pantheon.ufrj.br/bitstream/11422/2738/1/200405.pdf (accessed April 29, 2021).



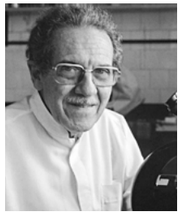
Morphology of heads of insects of the order Hemiptera

Fonds José Jurberg.



Morphology of mouthparts of insects of the order Hemiptera

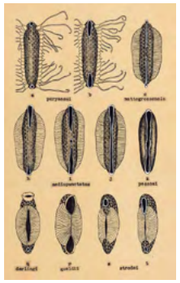
Fonds José Jurberg.



Leônidas de Mello Deane

Leônidas de Mello Deane in his laboratory at the IOC Entomology Department, Carlos Chagas Pavilion, 1980s

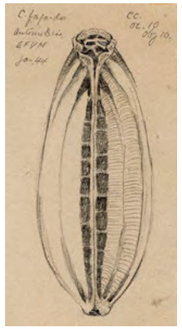
Fonds Casa de Oswaldo Cruz.



Eggs of *Anopheles* mosquitoes from Brazil; dorsal view

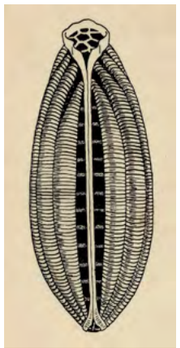
Fonds Leônidas Deane.

Published in: CAUSEY, Otis R.; DEANE, Leônidas de Mello; DEANE, Maria Paumgartten. An illustrated key to the eggs of thirty species of Brazilian anophelines, with several new descriptions. *American Journal of Hygiene*, Baltimore, v.39, n.1, p.1-7, 1944.



Chagasia fajardi (Lutz, 1904); draft sketch of egg

Fonds Leônidas Deane.



Chagasia fajardi (Lutz, 1904); finished drawing of egg

Fonds Leônidas Deane.

Luiz Kattenbach

Published in: TENDÊNCIAS e manifestações de arte moderna em face da orientação revolucionária. *Diário da Noite*, Rio de Janeiro, ano 3, n.472, p.1, 17 abr. 1931. http://memoria.bn.br/DocReader/221961_01/5692 (accessed January 4, 2019).

Cimex limai, now *Propicimex limai* (Pinto, 1927)

Fonds Herman Lent..

Manoel de Castro Silva

Fonds Oswaldo Cruz Institute.

Published in: IN MEMORIAM: Manoel de Castro e Silva. *Memórias do Instituto Oswaldo Cruz*, Rio de Janeiro, v.28, n.4, p.1, 1934. https://www.scielo.br/pdf/mioc/v28n4/tomo28(f4)_I.pdf (accessed April 5, 2019).

Chagasia fajardi (Lutz, 1904); larva structures

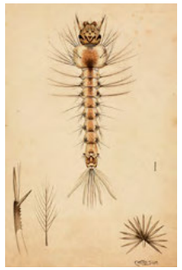
Fonds Oswaldo Cruz Institute.

Published in: PERYASSÚ, Antonio Gonçalves. *Os culicideos do Brazil*. Rio de Janeiro: Typographia Leuzinger, 1908. fig.11.

Dendromyia personata, now *Onirion personatum* (Lutz, 1904); dorsal view of larva

Fonds Oswaldo Cruz Institute.

Published in: PERYASSÚ, Antonio Gonçalves. *Os culicideos do Brazil*. Rio de Janeiro: Typographia Leuzinger, 1908. fig.23.



Myzorhynchella lutzii, now *Anopheles lutzii* Cruz, 1901; dorsal view of larva

Fonds Oswaldo Cruz Institute.

Published in: PERYASSÚ, Antonio Gonçalves. *Os culicideos do Brazil*. Rio de Janeiro: Typographia Leuzinger, 1908. fig.30.

Myzorhynchella parva, now *Anopheles parvus* (Chagas, 1907); dorsal view of adult mosquito

Fonds Oswaldo Cruz Institute.

Published in: PERYASSÚ, Antonio Gonçalves. *Os culicideos do Brazil*. Rio de Janeiro: Typographia Leuzinger, 1908. fig.54.

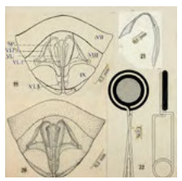
Marcos Kogan

Fonds José Jurberg.

Halictophagus lopesi Oliveira & Kogan, 1959; dorsal view of male

Fonds Oswaldo Cruz Institute.

Published in: OLIVEIRA, Sebastião José de; KOGAN, Marcos. A contribution to the knowledge of the Brazilian Strepsiptera (Insecta). *Memórias do Instituto Oswaldo Cruz*, Rio de Janeiro, v.57, n.2, p.131-145, 1959. https://www.scielo.br/pdf/mioc/v57n2/tomo57(f2)_131-145.pdf (accessed June 4, 2019).



Corythaica cyathicollis (Costa, 1864); female genitalia and instrument used for control purposes when raising specimens

Fonds Oswaldo Cruz Institute.

Published in: KOGAN, Marcos. Corythaica cyathicollis (Costa, 1864), aspectos sistemáticos, biológicos e econômicos (Hemiptera, Tingidae). *Memórias do Instituto Oswaldo Cruz*, Rio de Janeiro, v.58, n.1, p.59-88, 1960. https://www.scielo.br/pdf/mioc/v58n1/tomo58(f1)_061-090.pdf (accessed June 4, 2019).

Corythaica cyathicollis (Costa, 1864); eggs on the leaves of a tomato plant and phases of hatching of neanide

Fonds Oswaldo Cruz Institute.

Published in: KOGAN, Marcos. Corythaica cyathicollis (Costa, 1864), aspectos sistemáticos, biológicos e econômicos (Hemiptera, Tingidae). *Memórias do Instituto Oswaldo Cruz*, Rio de Janeiro, v.58, n.1, p.59-88, 1960. https://www.scielo.br/pdf/mioc/v58n1/tomo58(f1)_061-090.pdf (accessed June 4, 2019).

Hypoprasis harpagon Fairmaire & Germain, 1864; dorsal view of full body

Fonds Oswaldo Cruz Institute.

Published in: KOGAN, Marcos. Considerações sobre o gênero "Hypoprasis" Fairmaire & Germain (Coleoptera, Buprestidae). *Revista Brasileira de Biologia*, Rio de Janeiro, v.20, n.3, p.303-313, 1960

Pachyschelus subundulatus Kerremans, 1896; stages of development and oviposition on a *Terminalia catappa* leaf

Fonds Oswaldo Cruz Institute.

Published in: KOGAN, Marcos. Contribuição ao conhecimento da sistemática e biologia de buprestídeos minadores do gênero Pachyschelus Solier, 1833 (Coleoptera, Buprestidae). *Memórias do Instituto Oswaldo Cruz*, Rio de Janeiro, v.61, n.3, p.429-457, 1963. https://www.scielo.br/pdf/mioc/v61n3/tomo61(f3)_041-069.pdf (accessed June 5, 2019).

Tachygonus minans Kogan, 1963; dorsal view

Fonds Oswaldo Cruz Institute.

Published in: KOGAN, Marcos. Uma nova espécie do gênero "Tachygonus" Schoenherr, 1833 e observações sobre seus hábitos minadores (Coleoptera, Curculionidae). *Revista Brasileira de Biologia*, Rio de Janeiro, v.23, n.1, p.85-94, 1963.

Tachygonus minans Kogan, 1963; ventral view of pupa

Fonds Oswaldo Cruz Institute.

Published in: KOGAN, Marcos. Uma nova espécie do gênero "Tachygonus" Schoenherr, 1833 e observações sobre seus hábitos minadores (Coleoptera, Curculionidae). *Revista Brasileira de Biologia*, Rio de Janeiro, v.23, n.1, p.85-94, 1963.

Brachys ingae Kogan, 1964; dorsal and ventral views of pupa

Fonds Oswaldo Cruz Institute.

Published in: KOGAN, Marcos. Notas biológicas e descrição de uma nova espécie do gênero "Brachys" Solier, 1833, minadora de folhas de "Inga sessilis" (Coleoptera, Buprestidae). *Revista Brasileira de Biologia*, Rio de Janeiro, v.24, n.4, p.393-404, 1964.

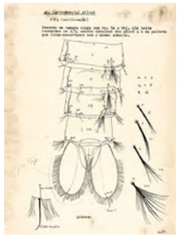
Maria José von Paumgartten Deane

Maria Deane at the IOC Protozoology Department

Leônidas and Maria Deane collection.

Anopheles gilesi (Neiva, 1908); details of the cephalothorax and first four abdominal segments of pupa

Fonds Leônidas Deane.



Anopheles gilesi (Neiva, 1908); posterior portion of abdomen and details of bristles of pupa

Fonds Leônidas Deane.

Martín Ladislao Aczél

Published in: HARDY, D. Elmo. Dr. Martin L. Aczél, 1906-1958. *Proceedings of the Entomological Society of Washington*, Washington, D.C., v.61, n.3, p.139, 1959.

Structures of the wing, head, mesonotum, foot, epandrium, and ovipositor of fly species of the family Neriidae: *Eoneria blanchardi* Aczél, 1951; *Eoneria maldonadoi* Aczél, 1961; *Eoloxozus sabroskyi* Aczél, 1961; and *Imrenerius cinereus*, now *Antillonerius cinereus* (Roder, 1885)

Fonds Oswaldo Cruz Institute.

Published in: ACZÉL, Martín Ladislao. A revision of American Neriidae (Diptera, Acalyptratae). *Studia Entomologica*, Rio de Janeiro, v.4, n.1/4, p.257-346, 1961.

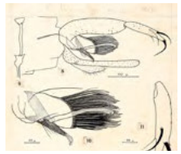
Octávio Mangabeira Filho

Fonds Herman Lent.

Flebotomus lenti, now *Lutzomyia lenti* (Mangabeira, 1938); male

Fonds Oswaldo Cruz Institute.

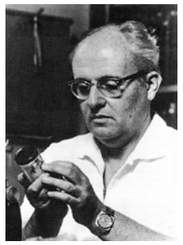
Published in: MANGABEIRA FILHO, Octávio. Sobre duas novas espécies de Flebotomus (Diptera: Psychodidae). *Memórias do Instituto Oswaldo Cruz*, Rio de Janeiro, v.33, n.3, p.349-356, 1938. https://www.scielo.br/pdf/mioc/v33n3/tomo33(f3)_349-356.pdf (accessed September 10, 2019).



Flebotomus hirsutus, now *Psychodopygus hirsutus* (Mangabeira, 1942); male

Fonds Oswaldo Cruz Institute.

Published in: MANGABEIRA FILHO, Octávio. 7ª Contribuição ao estudo dos Flebotomus (Diptera: Psychodidae): descrição dos machos de 24 novas espécies. *Memórias do Instituto Oswaldo Cruz*, Rio de Janeiro, v.37, n.2, p.111-218, 1942. https://www.scielo.br/pdf/mioc/v37n2/tomo37(f2)_111-218.pdf (accessed September 10, 2019).



Petr Wolfgang Wygodzinsky

Published in: SCHUH, Randall T.; HERMAN, Lee H. Biography and bibliography: Petr Wolfgang Wygodzinsky (1916-1987). *Journal of the New York Entomological Society*, New York, v.96, n.2, p.227-244, 1988. https://www.biodiversitylibrary.org/page/50779406#page/241/mode/1up (accessed February 11, 2019).

Opisthacidius sp.; nymph, fifth instar, and structures of head and bristles

Fonds Herman Lent.

Published in: LENT, Herman; WYGODZINSKY, Petr. Contribuição ao conhecimento dos Reduviinae americanos (Reduviidae, Hemiptera). *Revista Brasileira de Biologia*, Rio de Janeiro, v.7, n.3, p.341-368, 1947.

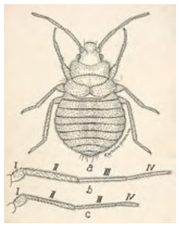
Triatoma sordida Stål, 1859; dorsal view of female

Fonds Herman Lent.

Raymundo Honório Daniel

Raymundo Honório Daniel, 1969

Centro de Ciências da Saúde da Universidade Federal do Rio de Janeiro archival collection.



Dorsal side and antenna of female *Haematosiphon inodora* (Dugès, 1892) (a) and (b); antenna of *Cimex lectularius* (Linnaeus, 1758) (c), bedbugs that parasitize birds and mammals

Fonds Herman Lent.

Published in: PINTO, César. *Tratado de parasitologia*: artrópodes, parasitos e transmissores de doenças. Rio de Janeiro: Pimenta de Mello, 1930. v.4, tomo 1, p.275. Drawing copied from: OSBORN, Herbert. *Insects affecting domestic animals*: an account of the species of importance in North America, with mention of related forms occurring on other animals. Washington: Government Printing Office, 1896. (Bulletin, U. S. Department of Agriculture, Division of Entomology, n.5, new series).

Eutriatoma nigromaculata Lent & Pifano, 1939, synonymous with *Triatoma nigromaculata* (Stål, 1872); profile of head of male

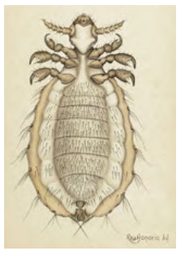
Fonds Herman Lent.

Published in: LENT, Herman; PIFANO C., Félix. Dados experimentais sobre a infestação do Eutriatoma nigromaculata (Stål, 1872) pelo Schizotrypanum cruzi (Chagas, 1909), e sua redescrição. *Memórias do Instituto Oswaldo Cruz*, Rio de Janeiro, v.34, n.4, p.627-635, 1939. https://www.scielo.br/pdf/mioc/v34n4/tomo34(f4)_627-635.pdf (accessed October 10, 2019).

Phloeophana longirostris (Spinola, 1837); dorsal view of female

Fonds José Jurberg.

Published in: LENT, Herman; JURBERG, José. Contribuição ao conhecimento dos Phloeidae Dallas, 1851, com um estudo sobre genitália (Hemiptera, Pentatomoidea). *Revista Brasileira de Biologia*, Rio de Janeiro, v.25, n.2, p.123-144, 1965.

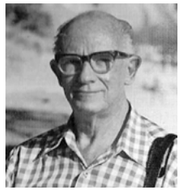


Ventral view of a lice of the sub-order Anoplura

Fonds Oswaldo Cruz Institute.

Lateral view of an egg of a Triatominae, showing detail of the egg shell

Fonds Herman Lent.



Roger Pierre Hipolyte Arlé

Published in: JURBERG, Claudia; ARLÉ, Monique. Roger Pierre Hipolyte Arlé (1909-2001). *Entomología y Vectores*, Rio de Janeiro, v.9, n.1, p.1-13, 2002.

Pristocera gigantea Arlé, 1930; dorsal view of male

Fonds Oswaldo Cruz Institute.

Published in: ARLÉ, Roger. Un nouveau Pristocera de l'Afrique equatoriale. *Bulletin du Muséum National d'Histoire Naturelle*, Paris, 2ª série, v.2, n.5, p.546-547, 1930.

Eutriatoma nigromaculata Lent & Pifano, 1939; synonymous with *Triatoma nigromaculata* (Stål, 1872); dorsal view of female

Fonds Herman Lent.

Published in: LENT, Herman; PIFANO C., Félix. Dados experimentais sobre a infestação do Eutriatoma nigromaculata (Stål, 1872) pelo Schizotrypanum cruzi (Chagas, 1909), e sua redescrição. *Memórias do Instituto Oswaldo Cruz*, Rio de Janeiro, v.34, n.4, p.627-635, 1939. https://www.scielo.br/pdf/mioc/v34n4/tomo34(f4)_627-635.pdf (accessed October 10, 2019).

Triatomaptera porteri Neiva & Lent, 1940; synonymous with *Mepraia spinolai* Porter, 1934; dorsal view of male

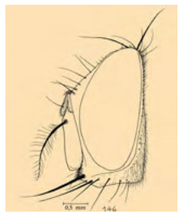
Fonds Herman Lent.

Published in: NEIVA, Arthur; LENT, Herman. Estudos sobre triatomideos do Chile: interessante caso de provável polimorfismo. *Memórias do Instituto Oswaldo Cruz*, Rio de Janeiro, v.35, n.2, p.343-363, 1940. https://www.scielo.br/pdf/mioc/v35n2/tomo35(f2)_343-363.pdf (accessed October 11, 2019).

Rubens Pinto de Mello

Rubens Pinto de Mello in his laboratory at IOC

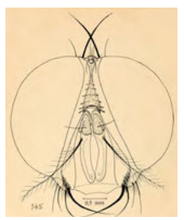
Catarina Macedo Lopes personal collection.



Huascaromusca grajauensis Mello, 1967; profile of head of male

Fonds Oswaldo Cruz Institute.

Published in: MELLO, Rubens Pinto de. Contribuição ao estudo dos Mesembrinellinae sul-americanos (Diptera, Calliphoridae). *Studia Entomologica*, Petrópolis, v.10, n.1/4, p.1-80, 1967.



Huascaromusca grajauensis Mello, 1967; front view of head of male

Fonds Oswaldo Cruz Institute.

Published in: MELLO, Rubens Pinto de. Contribuição ao estudo dos Mesembrinellinae sul-americanos (Diptera, Calliphoridae). *Studia Entomologica*, Petrópolis, v.10, n.1/4, p.1-80, 1967.

Other Manguinhos scketch artists

Edith da Fonseca Nogueira Penido

Coordenação Geral de Gestão de Pessoas/Fiocruz archival collection.

Joel Sampaio Antunes

Published in: EXPOSIÇÃO Illustrare Scientia – catálogo. Rio de Janeiro: Instituto de Comunicação e Informação Científica e Tecnológica em Saúde/Fiocruz, 2007.

José Eduardo Prado

Published in: INSTITUTO OSWALDO CRUZ. *Imagens da ciência ao alcance do público*. 2007. http://www.fiocruz.br/ioc/cgi/cgilua.exe/sys/start.htm?infoid=287&sid=32 (accessed September 2, 2020).

Luiz Augusto Cordeiro

Published in: LUIZ Cordeiro, pint. Rio de Janeiro, 1913. http://objdigital.bn.br/objdigital2/acervo_digital/div_iconografia/icon276572_276573/icon1418991.jpg (accessed September 14, 2019)

Raymundo Porciúncula de Moraes

Published in: AUTORETRATO. c.1950. http://porciunculademoraes.com.br/img/galeria/PM042.jpg (accessed September 14, 2019).

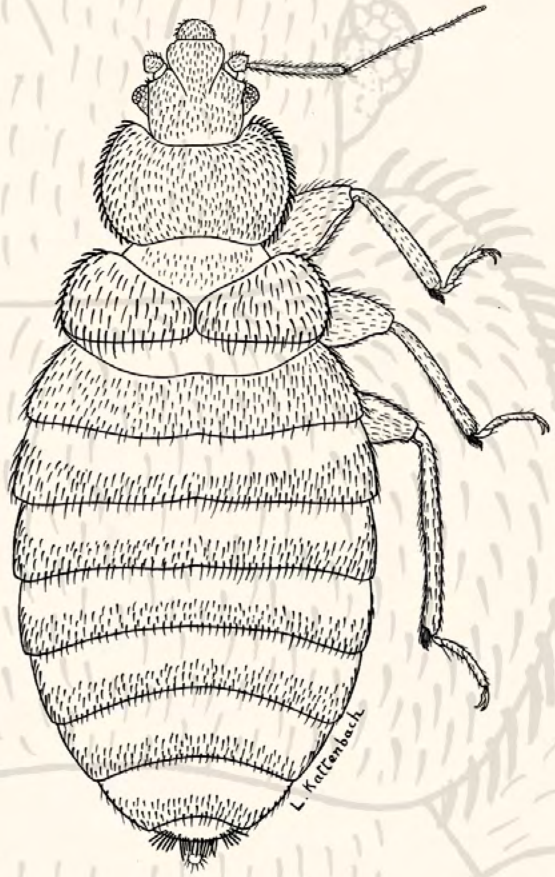
Renée Ferreira de Melo

Coordenação Geral de Gestão de Pessoas/Fiocruz archival collection

Walter Alves da Silva

Coordenação Geral de Gestão de Pessoas/Fiocruz archival collection

ISBN 978-65-87465-58-6



Ministério da Saúde
FIOCRUZ
Fundação Oswaldo Cruz

Casa de
Oswaldo Cruz

CNPq
Conselho Nacional de Desenvolvimento
Científico e Tecnológico