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# The New Building of the Bureau of Science, 1901-1905

**Abstract.** This paper is a historical reconstruction of the rationale behind the renaming of the Bureau of Government Laboratories into the Bureau of Science and the construction of its new building based on Paul C. Freer's account titled, *Description of New Buildings of the Bureau of Government Laboratories,* published in 1905. It is a critical reading of the scientific and modernizing project of the American colonial state in the Philppines through the Bureau of Science. The paper discusses in detail the structure and facilities of the new building and describes its reorganization including the administrative structure of its operations, as well as the establishment of laboratories in the new building. The Bureau of Science and its new building signified an inside/outside dichotomy which differentiated the modern spaces inhabited by the colonial scientists and the uncontrolled, unsubdued tropical environment of the Filipinos. An important adjunct to the American colonial regime, the Bureau of Science reflects the extent and reach of the scientific and modernizing project of the colonial state.

**Key Words:** Bureau of Government Laboratories, Philippine Bureau of Science, Philippine Commission, American colonial regime

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# The New Building of the Bureau of Science, 1901-1905

## Introduction

"We are cleaning up these islands, left foul and unsanitary and diseased by generations of hygienically ignorant people…."

– Dr. Victor G. Heiser,
Director of the Bureau of Health, Philippine Islands

This paper is a narrative on the renaming of the Bureau of Government Laboratories into the Bureau of Science and its transfer to its new building located in an area between Calle Herran and Calle Padre Faura. It locates the establishment of the Bureau of Science as part of the scientific and modernizing project of the American colonial regime, whose construction reflects the American's implicit racial bias against the Filipinos. This paper also details the work in this regard of Paul C. Freer, the first Superintendent of the Bureau of Government Laboratories, who not only designed the Bureau's laboratory but who also wrote a lengthy and detailed description of the structure and facilities of the new building titled, *Description of New Buildings of the Bureau of Government Laboratories*, published by the Bureau of Printing in 1905. *Description of the New Buildings* formed the basis for the data in this study. Freer's account is an authoritative source on the architecture and interior design, including the facilities of the new

building's scientific and technological structure. The building was the first of its kind constructed and completed in the Philippines during the first decade of American rule (Freer, 1905).

Part of the discussion dwells on the reorganization and the renaming of the Bureau of Government Laboratories as Bureau of Science as take-off point towards a critical reading of the motivations behind the reorganization, the administrative structure of the operations of the former Bureau of Government Laboratories, and its consequent reorganization as Bureau of Science. This paper argues that the establishment of the laboratories housed in the new building signified an inside/outside dichotomy which differentiated the modern spaces inhabited by the colonial scientists and the uncontrolled, unsubdued tropical environment of the Filipinos.

Recruited by Dean C. Worcester, Secretary of Interior (1901-1913), Paul C. Freer was Professor of Inorganic Chemistry from the University of Michigan. He was appointed Superintendent of the Bureau of Government Laboratories on 21 June 1901, and began his duties on 25 September 1901. Freer was chosen because of his familiarity with the laboratories in Europe and the United States (Philippine Commission [PC], 1903, p. 289). Freer also specialized in chemical research and trained under Adolf von Bayer, who was awarded the Nobel Prize for Chemistry in 1905, for his work on organic chemistry and the chemical industry at the University of Munich, where he obtained his PhD in Chemistry in 1887. Freer's life was devoted solely to laboratory and scientific research. Prior to his arrival in Manila in 1901, Freer had already published fourteen articles on ketones and aldehydes, including papers on the saponification of substituted acetic ester, tetrinic acid, the constitution of some derivatives of former acids on metals, and halogen substitution products of aliphatic acids, among others. In addition, he also authored textbooks on the elements of chemistry and descriptive inorganic chemistry (PC, 1903, p. 289).

Freer undertook his stint in the Philippines while on leave from the University of Michigan. In his third year in the Philippines, Worcester persuaded him to become a permanent member of the Insular Government, which was established in 1904. In 1905, Freer became the Director of the Bureau of Science.

An important adjunct to the American colonial regime, the Bureau of Science housed in its new building with its centralized laboratories the extent and reach of the scientific and modernizing project of the colonial state, even as it was built on racist views of the Filipinos, which justified the American civilizing mission in the Philippines. Such justification may be described as Manichaean, a colonial discourse whereby the locals are commodified as stereotyped objects (i.e., Filipino bodies – unhygienic and therefore sources of contamination and danger vis-à-vis American bodies – white and vulnerable to the perils inherent in the tropics).

## The Bureau of Government Laboratories

Prior to the establishment of the Bureau of Science, there was the Bureau of Government Laboratories, which was established through Act No. 156 of the Philippine Commission. This act was in response to the need to have laboratories that would produce vaccines and sera as a means to help arrest the spread of various epidemic diseases that ravaged thePhilippines during the period under consideration. In fact, prior to the establishment of the Bureau of Government Laboratories, American colonial officials had already recognized the need to have a biological laboratory for the early diagnosis of typhoid and malarial fevers, tuberculosis, bubonic plague, different kinds of dysentery, and other unfamiliar diseases at that time. Underpinning this pursuit was the importance of preserving public health, prompting American colonial officials to establish facilities for the production of vaccines, sera, and prophylactics, and chemical work on urine, feces, sputum, and blood examinations. In the

report of the Philippine Commision, the Bureau of Government Laboratories, during the first months of its first year of existence, consisted of a chemical and biological laboratory and had only six employees, which was gradually increased in response to the outbreak of epidemic diseases (PC, 1903, p. 290). In 1902, Richard P. Strong, 1st Lieutenant and Assistant Surgeon, US Army, was appointed Director of the Biological Laboratory. The working force of the Bureau was comprised of a chemist and investigator, a physiological chemist and analytic chemist, two assistant chemists, an assistant biologist, assistant bacteriologist, and a photographer, as well as the necessary clerical assistants and laboratory servants (PC, 1903, p. 290). In December of the same year, entomological researches were undertaken, which made possible the inclusion of an entomological section. In January 1903, the serum laboratory which was under the supervision of the Insular Board of Health, was transferred to the Bureau of Government Laboratories through Act 607 of the Philippine Commission. This was undertaken because the Insular Board of Health was unable to prioritize the preparation of sera and vaccines. In July 1903, the Botanical Section, originally a part of the Bureau of Agriculture, including what eventually was to become the herbarium, was added to the Bureau.

At the macro-level, the Bureau of Government Laboratories was under the supervision and control of the Department of Interior, in accordance with the bureaucratic structure of the Taft Commision headed by William Howard Taft in 1901. Under Taft, four departments were established through Act No. 222 of the Philippine Commission, and was passed on 6 September 1907. These four departments were the Departments of: Interior, Commerce and Police, Finance and Justice, and Public Instruction, although there have already been Bureaus such as the Bureau of: a) Health; b) Quarantine Service of the Marine Hospital Corps; c) Forestry; d) Mining; e) Weather; f) Public Lands; g) Government

Laboratories; h) Patents; and i) Copyrights that have been created prior to this law (Sullivan, 1991, p. 98).

Upon the formal establishment of the American colonial state in the Philippines and the unstable public health conditions during that period, the need to expand the scope of the work of the Bureau of Government Laboratories was already recognized. Moreover, there was also the recognition of the need to extend its research work beyond providing primarily laboratory assistance for the diagnosis and cure of diseases as it was deemed crucial in American state formation in the Philippines. For example, the establishment of the Mining Bureau meant that the nomenclature, "Government Laboratories", had become limited because mining did not involve laboratory work in the proper sense of the word (PC, 1905, p. 29). The renaming was also necessary because the Bureau was envisioned to become a principal research hub in tropical medicine where scientists not only from the US but also from other parts of the world could undertake their research. The Bureau of Science was also envisioned as a staging post for scientists in the Philippines prior to their resuming metropolitan and academic careers in the United States.

## Administrative Structure

Act No. 1407 or the Reorganization Act modified the colonial bureaucratic setup by dissolving some bureaus to streamline and centralize the bureaucratic administration. The Bureau of Mining was dissolved and transferred to the Bureau of Government Laboratories as the Division of Mines. The same law also expanded and renamed existing bureaus, including the Bureau of Government Laboratories as the Bureau of Science. As a result, the new Bureau of Science was expanded to include other functions beyond providing laboratory medicine or the medical sciences. Nevertheless, the Act did not alter the chain of command

and the hierarchy of authority which still emanated from the Philippine Commission. By 1905, the new Bureau of Science had an increased personnel and new working divisions not only in the medical sciences but also in chemistry, botany, entomology, mining, ethnology, geology, and paleontology. Indeed, its renaming emphasized its wider scope.

## The New Building

Since the value of laboratory work was considered significant, the Bureau of Government Laboratories was expected to produce work of the highest quality. According to Freer, laboratory work is, "so difficult in nature, so important and if imperfect methods are used, so subject to error, that a poor equipment both in the literature and apparatuses would be the precursor of failure"(1905, p. 7). Freer never got tired of extolling the pricelessness of the laboratory in almost all aspects of colonial life, ranging from bacteriological examinations, researches on local flora and fauna, food and drinks analysis including imported products, the determination of values for customs duties, the testing of the strength of cements, and the assaying of ores (Freer, 1905, p. 8). The unification of all laboratory activities upon the completion of the new building of the Bureau of Science in 1905, became the realization of Freer's vision.

The new building was a product of detailed planning, coordinated administrative effort, and legislative enactment. The choice of the site was done after a thorough ground canvassing by Dean C. Worcester, Secretary of the Interior, Bernard Moses, Secretary of Public Instruction, and Freer himself (Philippine Commission, 1903, p. 343). The site was bought by the colonial government from the Catholic Church. It covered an area of 26.5 acres, and was formerly the Exposition Grounds between Calle Herran and Calle Padre Faura. According to Freer, the choice of the site was appropriate because, "this land is much nearer to the heart of the city, and its situation is such that were a hospital

to be placed, the length of the trips of the ambulances and the patients would be minimized" (Freer, 1905, p. 14).

Since a health and research complex on the same site was also envisioned by colonial officials such as Worcester, the site was expected to be of sufficient size to accommodate not only the laboratory buildings and all future wings but also a proposed medical college and the necessary hospital structures (Freer, 1905, p. 14). Of equal consideration was the site's proximity to a hospital as, "laboratory work is an essential success in modern hospitals" (Freer, 1905, pp. 13-14). Moreover, the site was also considered appropriate since it could house a power plant to be built that could, "provide all the rooms with vacuum, air pressure, and steam" (Freer, 1905, pp. 13-14). The building was also designed to provide electricity and thus provide electrical lighting to all the laboratories.

One of the primary considerations for the need to have a new building was also the inadequate space of the temporary quarters on Calle Iris, which was the area where the old building of the Bureau of Government Laboratories was located. In fact, the Superintendent of the Bureau of Government Laboratories himself was compelled to rent an auxiliary building on Calle Alix within the area's proximity in order to accommodate the increasing scientific work. In addition, when the Serum Laboratory was transferred from the Board of Health to the Bureau of Government Laboratories, it was provided with accommodations that were only sufficient for ten vaccine calves, fifteen or twenty serum cattle, and five or six horses (Philippine Commission, 1903, p. 344). This allocation was insufficient because of the increasing demand for vaccine and rinderpest serum due to the prevalence of smallpox. The work of circulating animals also made it necessary for the Bureau of Government Laboratories to build a quarantine station (Freer, 1905, p. 14). Therefore, the structure was considered temporary. Besides, the presence of a large number

of animals near the hospital was not desirable, apart from the fact that the Board of Health also needed space for its own buildings.

As early as 1902, entomological investigations were undertaken, which laid the necessary conditions for the establishment of an entomological section in the new building of the Bureau of Science. The botanical section, originally a part of the Bureau of Agriculture, including what was later to become the herbarium, was added to the former Bureau of Government Laboratories in 1903. A few months after the new building was occupied, the Bureau of Mines became the Division of Mines of the Bureau of Science in 1905. A year later, the Bureau of Ethnology became the Ethnological Division of the Bureau of Science.

The need for more space as one of the rationales for a new building was also imperative because facilities/living quarters had to be provided for scientists from abroad who desired to undertake scientific studies in the Philippines. The Bureau with its new building and centralized administration was also expected to host for extended periods notable scientific men and women whose researches were expected to benefit the colonial state (PC,1904, p. 411).

As the new building of the Bureau of Science, a product of Worcester's institutional support and Freer's demands for, "the highest type of trained investigators, a complete library, and exceptional facilities", the new building was provided with state-of-the-art equipment—"a modern power plant had been installed of a capacity to provide all the rooms with a vacuum, air pressure and steam and to light all the laboratory buildings" (Freer, 1905, p. 8). Freer further wrote that:

> Steam was led from two 75 horsepower Babcock and Wilcox steel sectional boilers through a 4-inch copper expansion to an eight-inch extra heavy steel pipe header from which a 7-inch steam main drops to the pipe subway. Electric current was conveyed to various laboratory rooms from a storage

battery of 20 cells. In the engine room were two Westinghouse 37.5 kilowatt six-pole compound wound, direct current generators connected to two horizontal single expansion Ideal automotive engines of 60 horsepower each. Each generator had a capacity of 300 amperes at a electromotive force of 125 volts at a speed range of 290 to 320 resolutions per minute. These generators were protected by an I-T-E laminated circuit breaker. Refrigeration was provided by a Brunswick double-cylinder single acting ammonia compressor of 3 tons' refrigerating capacity directly connected to a General Electric eight pole slow speed motor". (Freer, 1905, pp. 13-19)

Freer notes that these equipment were needed to ensure the efficient manufacture of vaccines, sera, and prophylactic and were essential in order that laboratory work would always be of the highest quality (Freer, 1905, pp.13-19).

Alongside infrastructure building were considerations that reflected the conditions in a tropical environment. Ventilations of rooms to keep them cool, for example, were given utmost priority. The rooms were grouped on either side of a large main corridor, 16 feet wide and running the entire length of the building. Based on this building plan, there was open ventilation with continuous breeze generally supplying suction as it passed the doors of the individual laboratories, thereby producing constant air circulation as soon as the halfway was opened at either end. Furthermore, the building had a two-story structure to prevent leakage or breakage of containers of liquids. Freer believed that this design minimized structural spillage, especially when earthquakes occurred (Freer, 1905, pp.13-19).

## The Main Laboratory Structure: Biological and Chemical Wings

The main laboratory structure of the new Bureau of Science building was the largest part of the building. This structure faced the south and was divided into two symmetrical portions—the east for the biological laboratory and the west for the chemical laboratory. There was also a 32x30-inch wide microscope table

along the entire window front (Freer, 1905, p. 19). Each of these tables contained two small sinks with water and gas. Windows were placed approximately 16 inches from the desks to prevent the wind from disrupting the materials on the work table. In the center of the rooms of the biological wing were large double work desks, two at the most, which were 36 inches in height for the general work of the laboratory, providing facilities for heating, filtering, distilling, etc. These desks were always provided with water, gas, and vacuum and had a large sink and drip board at one end. A board eight feet in length occupied the opposite wall. Its flue was extended to the attic and connected with the main exhaust tanks so that ample draft would be provided (Freer, 1905, p. 21).

A special room on the ground floor was also exclusively made for the preparation of culture media. In the same room, steam was provided for the sterilizers including the main autoclaves of the building. On each floor of the biological room, was a room of 10 feet and 24 feet long for refrigerating hoses and the incubators, which used bunsen burners. Since it had been proven unwise and unhealthy to have experimental animals inside the building, a separate house for this purpose was made at the rear end of the biological laboratory. In this house, two large rooms were used separately, the front for the storage of animals which were under observation for any sickness while the other room, which was completely isolated and screened was intended for work on plague, smallpox, cholera, and other diseases (Freer, 1905, p. 22).

A similar observation could be made when the visitor-reader proceeds to the chemical wing of the building, which did not vary greatly from those found in the biological wing because biologists were now carrying their investigations into fields more closely allied to chemistry. The central large laboratory desk, for example, had two central troughs connected with a large sink equipped with a reagent shelf in the middle. The hood in this wing was by far larger than those found in the previous wing varying from 9,

12, and even up to 15 feet in length. These hoods were provided with rising sash and glass fronts and sides. In addition to the usual gas, water, and vacuum, these hoods also had steam and exhaust pipes so that evaporation was continuously carried out (Freer, 1905, p. 13).

There were also rooms that slightly differed from the general design of the biological and chemical wing, such as the room on the ground floor, which extends three feet below ground level. An ordinary wall deck provided with gas and water could be seen on one side of the main physics room for the electric conductivity measures and physical chemistry purposes. Additional features of the room included a storage battery connection with a large thermostat tank. A second room was connected through a doorway and contained a deck and a hood for chemical work in a physical laboratory, while a third room was for photometric work essential in studying the sun's rays and other acclimatization research (Freer, 1905, p. 24).

Across the hall of the rooms assigned for physics, physical chemistry, and photometry work was a large room for commercial processes (Freer, 1905, p. 24). It had the usual central work table and a long hood except for a table occupying one of the walls, on which were placed the shaking and turning machines for the extraction of organic products (Freer, 1905, p. 24). A motor of one-half horsepower powered the machines which were also belt-driven. The extraction apparatus, imported from Berlin, consisted of a large boiler and a kettle of 140- and 100-liter capacity, respectively. The other rooms were for the assay laboratory, balance, combustion, and photography. The photographer's room was impressive since the photomicrographic apparatus was one of the latest Zeiss patterns—both stand and camera. The two large deck rooms were equipped with large leaded sinks, drip board, shelving, and tables. The serum laboratory found in the powerhouse did not differ greatly from the biological wing,

except that it had a serum kitchen which contained a large, steam supplied autoclave and sterilizer of a pattern made by Bausch and Lomb and a centrifugal from Lautenschlager (Berlin), which was driven by a four-horsepower motor (Freer, 1905, pp. 26-27).

A fly-proof horse stable and vaccine stable were also attached to the serum laboratory. The latter kept calves under thoroughly aseptic conditions. The other two parts of the powerhouse were an operating room for serum collection and a small edifice for dogs, goats, and monekys. The museum had enough jars of all sizes where anatomical and histological samples were carefully preserved, along with a collection of local parasites and insects (Freer, 1905, p. 28).

Freer went out of his way in choosing the equipment to be used in the new building. Most of them were imported from the west, particularly Europe. It was always a requirement, according to Freer, "that the equipment of a laboratory at such a distance from the base of supplies be somewhat more extensive and complete than it would be in the Western countries" (Freer, 1905, pp. 27-28). Below are some of these imported items (Freer, 1905, pp. 27-28):

1. microscopes from Zeiss, Jena;
2. incubators from F and M Lautenschlager, Berlin;
3. chemical balances from Sartorius of Goetingen and Ruprecht, Vienna;
4. laboratory thermometers from A. Haak, Jena; and
5. electricity and electric conductivity measurements from Goetze, Leipzig.

## The Library

The library of the Bureau of Science occupied a central position in the new building and assumed a significant role, particularly for Freer's highly trained investigators. The library was located in the middle rooms in the front part of the building. It had a floor

space of 86 by 24 feet, with an extension of 26 by 23 feet, in the center in which are placed the shelves for the current numbers of periodicals, map and chart cases, as well as reading tables (Freer, 1905, p. 28).

The library collection started with fifty books that were donated from the Board of Health, and which were initially housed at the old site of the Bureau of Science. Subscriptions for scientific journals and periodicals since 1902, also formed part of the library's initial holdings. The bureau clerks used to be in charge of the holdings until 1903, when large numbers of periodicals, books, and manuals that were ordered in 1902, began to arrive. A professional librarian was then appointed in the same year to access, classify, catalogue, and care for what was then perceived as a continuously growing collection of books, periodicals, and pamphlets (Freer, 1905, pp. 43-44).

Mary Polk who served as the librarian (1903-1924), wrote a catalogue of the library's holdings which was published as an attachment to Freer's, *Description of New Buildings* (See Freer, 1905). By 30 September 1904, the library collection which had been growing had more than 17,350 volumes. The scope of the library was so extensive that any researcher, local or foreign, was assured of a good collection of scientific literature. From 1908, the library of the Bureau of Science served as the scientific library of the colonial state.

Book transfers from the different colonial agencies eventually increased the library's holdings and broadened the scope of its subject listings. By September 1905, the various libraries of the Department of Interior had turned over 6,799 volumes. The transfers were in accordance with the results of a meeting called by the Secretary of Interior, Dean C. Worcester, where various bureau chiefs of the Interior Department presided by Worcester himself resolved to transfer to the Bureau of Government Laboratories all books and periodicals from the

different bureaus of the Interior Department. This meant the transfer of an enormous amount of books and periodicals, which influenced Worcester's decision to transform the library of the Bureau of Government Laboratories into the central scientific library for the whole colony. From the Bureau of Agriculture, 1,359 volumes were transferred; Forestry, 1,766; Mining, 1,807; Public Health, 145; Public Lands, 115; Ethnological Survey, 1,216; Philippine Civil Hospital, 28; Public Health and Marine hospital Service, 151; and Philippine Exposition Board, 212 (Philippine Commission, 1905, p. 345). Freer, who was always concerned with maintaining the quality of the library's collection, required that varnish be applied regularly to the books, as there were instances when a spider wasp had built its nest and termites had done slight damage to the books. Aside from the periodic inspection and cleaning of every book, extra precautions were taken since the discovery of these insects(Philippine Commission, 1905, p. 348). These developments benefitted the Bureau of Science and showed Worcester's serious interest in scientific work in the Philippines.

## Cost of Construction

When the new building was formally opened on 28 February 1905, the cost of construction and equipment amounted to $263,508.99. This amount represented the expenses in terms of construction materials for the main building and powerhouse amounting to $121,099.55; mechanical equipment, laboratory desks, hoods, fixtures, etc. -- $68,475.06; stables and small animal houses -- $11,022.28; grading and filling -- $912.30; permanent apparatuses -- $26,000.00; and the library -- $36,000.00 (Philippine Commission, 1905, p. 329).

The total budget allotted for the building reflected the strong institutional support given to scientific research during the period under consideration, given that the total amount of government expenditures in the priority area of education at

this time averaged only three million dollars, which was about one-fifth of the Philippine revenue (Sullivan, 1991, p. 117). This substantial capital outlay in completing the construction of the new building could be credited to Freer, who said: "When we consider the results which can be obtained by a thoroughly equipped laboratory and the many ways in which this institution already has aided the government, this cost is certainly a moderate one" (Philippine Commission, 1905, p. 329).

Freer wrote that prior to the completion of the new building, valuable information in several fields of scientific inquiry had already been acquired, disseminated, and published, which in many respects aided in the diagnoses of diseases and helped in preserving public health in the Philippines. This accomplishment was also made possible by the sufficient and constant supply of prophylactic and sera. According to Freer, more than the total cost, the educational value of a scientific bureau including the possession and use of a scientific library could not be underestimated (Freer, 1905).

## A Technologically Impressive Edifice

With the centralization of laboratory activities in the new building and its insitutionalization under the Bureau of Science, the colonial government's public health policy implemented through the Bureau of Health was provided with technical support. These were the production of sera for numerous contagious diseases, bacteriological examinations, and necropsies, among others. The Bureau of Science also undertook bacteriological examinations to determine the nature of dangerous diseases, which became the basis from which to derive vaccines and sera for the production of artificial immunity. The value and significance of the Bureau of Science, in this regard, cannot be overemphasized along with the "progress", brought by American colonial rule in the Philippines. According to William Musgrave, Dean of the College of Medicine of the University of the Philippines (1912-1916): "The history of

scientific progress in the Philippines begins with our occupation of the Islands" (Musgrave, 1911, p. 28).

## A Scientific and Modernizing Project

While the rhetoric that foregrounds the American civilizing mission as bringing science and progress to the Philippines informs our appreciation of American colonial rule in the Philippines, urban architectural forms such as the new building of the Bureau of Science, "give the plastic expression to the imperial presence, forms whose intent is to awe and impress" (McCoy & Scaran, 2010, p. 490). This was concretely played out in Freer's vision of the Bureau of Science as a world-class research center that would attract foreign scientists and academics to work in the Philippines. In fact, when Freer went to Europe on a leave of absence, he was able to network with some of Europe's leading professors and several of them were actually open to the invitation to relocate to the Philippines for a year or more (Philippine Commission, 1905, p. 333).

At the heart of the American project of bringing science to the Philippines is also the informed consciousness of the public health problems that beset the Philippines before and during the first two decades of American colonial rule. These problems, from the American point of view, were in large respects attributed to the absence of a systematic and institutionalized laboratory work on the epidemics that had swept the Philippines from the late 19th century to the early twentieth century.

Musgrave who was credited for discovering the fluke *Paragonimus westermani* in atypical foci in the body including the brain and abdominal viscera (Faust and Russell, 1964, p. 597), wrote: "The sanitary conditions of the country during this time were extremely bad. Frightful epidemics of rinderpest, hog cholera, and surra were rapidly destroying the animals of the country. There were literally thousands of cases of amoebic

dysentery in the city, an unusually severe and widespread epidemic of dengue fever [which] lasted several months, [and] plague still continued much too prevalent for comfort"(Musgrave, 1911, p. 29). In this regard, American colonial officials considered that the only solution to this problem was the establishment of a research laboratory so that these diseases would be given immediate attention and action.

Musgrave continued to note how American sanitary officers realized that most of the practical problems confronting them may be addressed through laboratory research. This finding added further impetus to the initiative to establish a scientific laboratory (Musgrave, 1911, p. 28). The importance of a laboratory and the benefit derived from it had already been proven in other American colonies such as Cuba and Panama. In these colonies, the American corps of medical research workers had achieved some of the most enduring results in improving sanitary conditions. Thus, American colonial health officials deemed that it was high time that these endeavors were replicated in the Philippines. Musgrave's observations largely echoed the common portrayal among American colonial officials of colonization as a humane and progressive act that entailed moral reform and social uplift of the colony. Victor G. Heiser, Director of Health in the Philippines (1905-1915), shared in this discursive formation, when he exhorted the need to transform the Filipinos from the, "weak and feeble race we have found them into the strong, healthy and enduring people they may yet become" (Heiser, 1910, p. 177).

The rhetoric of the American civilizing mission in the Philippines as concretely played out in the Bureau of Science is part of the body of representations the colonial power projected, and is essentially premised on the very notion of benevolent tutelage which discursively only the colonizer can provide. According to Rafael (2000):

> Colonization as assimilation was deemed a moral imperative, as wayward native children cut off from their Spanish fathers and desired by other European powers would now be adopted and protected by the compassionate embrace of the United States. As a father is bound to guide his son, the United States was charged with the development of native others. Neither exploitative nor enslaving, colonization entailed the cultivation of the felicity and perfection of the Philippine people through the uninterrupted devotion to those noble ideals which constitute the higher civilization of mankind. Because civilization is about civilizing love and the love of civilization, it must be absolutely distinct from the disruptive criminality of conquest. The allegory of benevolent assimilation effaces the violence of conquest by construing colonial rule as the most precious gift that the most civilized people can render to those still caught in a state of barbarous disorder. (p. 21)

The laboratory in this sense represented what was both scientific and modern in contrast to the, "extremely bad sanitary conditions" in the Philippines, which were continuously being reported and textualized by the Americans. For instance, colonial travelogues of the Taft Era (1901-1913) are replete with observations regarding the absence or lack of toilet facilities to further magnify the filth and the perceived danger in the tropics. Ralph Kent Buckland, a teacher assigned to Capiz in Panay Island, wrote that the boat to Capiz had no toilet facilities in it. He further wrote: "A walk around the deck failed to disclose any of the conveniences that Americans have come to regard as absolute necessities. There was not a sign of a bathroom nor even of a lavatory any place in the main deck" (Buckland, 1912, p.62). In addition to travel narratives, there were instances in domestic colonial life where the encounter between the American lady of the house (most of the time the wife of a colonial officer) and her native servants showed a hilarious yet overwhelmingly racist moment that condemned the colonized race as the embodiment of filth and danger. In her memoir, Edith Moses, wife of Bernard Moses, Secretary of Public Instruction in the Philippines (1901-1908), wrote of the difficulty of keeping her house clean and

noted how she needed twelve "Orientals" to do the "job". Moses further noted that when, "cholera struck in 1902, she hosed off the China boys and Filipinos with disinfectants to prevent the spread of germs"... "I made their eyes stick out with fright by describing a cholera germ...they go about with their mouths shut tight, scarcely daring to open lest a microbe pops into them" (Anderson, 2007, p. 93).

In this portrayal of their experiences in the Philippines and in the context of establishing the Bureau of Science a dichotomy is presented of what happens inside the laboratory and outside of it. The Bureau and its laboratories as a highly disinfected and antiseptic space produced inscriptions of the many dangers inherent in the filth and contamination of the tropical environment outside. The new building of the Bureau of Science—"the technologically impressive edifice", with, "state-of-the art equipment and ventilation"—was a colonial spatiality created to territorialize an ideal space by which this sanitized structure could transcend the environment it aims to control and subdue. As such, the new building was a showcase of the superior medical culture of American modernity vis-à-vis a racially inferior people who needed tutelage. According to Anderson (2007):

> The Manila Bureau of Science also provided a haven for those medical officers who sought a career in research. From their headquarters in Manila, army and civilian scientists sought to reinscribe the archipelago, producing rigorous environmental descriptions, detailed ethnographies, laboratory reports, discussions of sanitary engineering and architecture, and extensive physiological investigations. (p. 82)

Though by all means the construction of the new building of the Bureau of Science may simply be construed as a purely scientific and modernizing effort to aid in combatting epidemics and enforcing public sanitation and hygiene, this rationale was not without any predisposition to racialist thinking. From

Musgrave and Heiser, we can glean similar sentiments with the rest of the other American colonial officials, who more often than not spoke of the, "white man's burden", and of the need to lift the backward races. Freer, who was the main force behind the construction of the new building of the Bureau of Science, expressed the raciality of his notions of immunity when he said: "Therefore, over many generations, the acquired immunities of the indigenous people to the diseases that surrounded them had in fact become natural, heritable, and racial" (Anderson, 2007, p. 88).

Anderson further observes how the, "apparent racial homogeneity of lowland Filipinos aided early medical efforts to construct a simple dichotomy of white susceptibility and native immunity" (Anderson, 2007, p. 88).

Anderson cited Robert Bennett Bean, Professor of Anatomy at the new Philippine Medical School, who regarded Filipinos as a distinct type, although Bean noted the presence of elementary Iberian and primitive varieties (Anderson, 2007, p. 88). Anderson described how he tried to differentiate disease proclivities within the race and noted his observation that Iberian Filipinos who demonstrated some Spanish ancestry were most susceptible to all diseases especially to tuberculosis in comparison to the Primitive (i.e. pure Filipino) (Anderson, 2007, p. 88). According to Bean, "… this may be indicative that the European and Filipino offspring of the Iberian type is less resistant to disease in the tropics than is the aboriginal type on its own soil and in its natural environment" (Anderson, 2007, p. 88).

Major Charles Woodruff, Chief Surgeon of the Department of Luzon, in 1903, strengthened this view. In a circular he issued, Woodruff warned that one in five Filipino scouts carried the malarial parasite, even as these Filipinos do not show symptoms of the disease, noting that perhaps the Filipinos were racially

immune to these organisms. Nevertheless, Woodruff cautioned that even though the Filipinos were unharmed, "they are a source of fatal infection to white men, who do not possess this racial immunity" (Anderson, 2007, p. 91). Woodruff also made a clear warning to American colonial officials. He said:

> You are therefore to consider, all apparently healthy native soldiers as possible sources of infection to whites...natives with malaria would not benefit from treatment with quinine as the malaria germs in their blood lacked the vitality they acquired in nutritive white blood. Whites, however, always needed copious quinine. (Anderson, 2007, p. 91)

Woodrow Wilson (1921) also held racial notions of American's modernizing project. Wilson said:

> …self-government is a form of character. It follows upon the long discipline which gives a people self-possession, self-mastery, and the habit of order and peace…the steadiness of self-control and political mastery. And these things cannot be had without long discipline…No people can be given self-control of maturity. Only a long apprenticeship of obedience can secure them the precious possession. (pp. 52-53)

Informed by Lamarck, one of the most influential naturalist and evolutionary theorists at that time who argued that heredity underpinned all of human behavior, Wilson believed that Filipinos had no other choice but to accept tutelage under the guiding hands of the Americans in order that they too would be tutored, "in the discipline of law and would learn to love order and instinctively yield to it" (Stocking, 1968, p.253). In this sense, according to Rafael, self-government can only be achieved if Filipinos learned to reform their, "promiscuous excretory habits", and regulating the opening-and-closing of their anal sphincters. Benevolent Tutelage therefore required the colonized, "to submit unstintingly to a pedagogy of repression mastery" (Rafael, 2000, p.219). Thus, for Wilson and the rest of the American colonial officials who had similar sentiments, it is hard to imagine a Filipino people and a Filipino nation.

## Conclusion

In May 1918, Alvin J. Cox who succeeded Paul C. Freer wrote in the Bureau of Science Press Bulletin:

> Probably no government other than that of the Philippine Islands supports a so-called Bureau of Science, but nearly all governments carry on the kinds of work that the Bureau of Science does and recognize the efficiency and economy of centralization, and they refer to the Philippine Government as one where there has been no political interference and where the scientific work has been done efficiently, as it should be. (p. 1)

Since the transfer of the laboratories to the Bureau of Science in 1905, laboratory work in the Philippines was centralized. According to Cox, the people who worked in the laboratories had qualifications that reflected the scientific and modernizing project of the American government. Cox noted that the Bureau of Science had, "thirty scientists for all lines of investigation, including botany, bacteriology, serology, ornithology, marine biology, entomology, geology, chemistry, standardization, physical and mechanical testing, etc" (Cox, 1918, p. 1).

The Bureau of Science and its new building symbolized a space where experiments about the tropical environment were done so that in the long run, the colonial terrain would emulate the controlled and sanitized spaces of the laboratory.

At present the health and medical complex envisioned by the late Dean C. Worcester and which is currently occupied by the Philippine General Hospital (now under the management of UP Manila), the College of Medicine and Surgery, the College of Nursing, and the College of Dentistry—all of UP Manila, and the other adjoining government buildings on Pedro Gil and Padre Faura streets along Taft Avenue in the City of Manila, are the only structures that occupy what used to house the Bureau of Science. And what is left of the Bureau is an empty shell after the Second World War as well as a barely lingering memory

of what James A. LeRoy once wrote: "The Philippines may be considered today as a laboratory where an experiment with important bearings on the race problem is being conducted" (1910, p. 29).

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