

The Puerto Rico Journal of Public Health and Tropical Medicine (1925-1950): From a Health Department Bulletin to a UPR School of Tropical Medicine Scientific Journal

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This essay presents a history of the scientific journal of the University of Puerto Rico, School of Tropical Medicine (STM) under the auspices of Columbia University: *The Puerto Rico Journal of Public Health and Tropical Medicine*. This is the third article in a historical series about the STM, and includes supporting information relevant to the forthcoming articles on the school's scientific endeavors. This article is conceived as a history from the perspective of the literature of journal genre in the field of tropical medicine. The STM scientific journal, precursor of the *Puerto Rico Health Sciences Journal*, had five main stages. First (1925-1927), originated as an official bulletin of the Health Department (*Porto Rico Health Review*). Second (1927-1929), became a project of mutual collaboration between the Health Department and the STM, and the publication's title reflected the fields of public health and tropical medicine. Third (1929-1932), acquired a scientific focus as it changed to a quarterly science publication. Fourth (1932-1942), became a fully bilingual journal and acquired its definitive name. Fifth (1942-1950), the final phase in which the first Puerto Rican Director became the principal editor until the Journal's dissolution. The analysis of authorship and the content analysis of the topics of diseases, public health and basic sciences, clarify the history of tropical medicine during the first half of the 20th century in Puerto Rico. The article highlights major symbolic events that delve into the understanding of a collaborative exemplar of the modernity of medical science. [P R Health Sci J 2016;35:179-190]

Key words: PR Health Department, Scientific journal, Journal history, PRHSJ

The purpose of this article is to portray a historical account of the scientific journal of the University of Puerto Rico (UPR) School of Tropical Medicine (STM) under the auspices of Columbia University (1). This is the third article in a historical series about the STM, and includes supporting information relevant to the forthcoming articles on the STM's scientific endeavors; it also is intended to provide primary sources for future studies (2). The origins of the STM scientific journal (STM-Journal or Journal) date back to July 1925, when the Health Department (HD) started to publish the *Porto Rico Health Review*, an official monthly bulletin in English (3). The primary focus of the publication was "preventive medicine," and included relevant health news, reviews and reports. The original editors were senior members of the HD: Commissioner Pedro N. Ortiz and Assistant Commissioner Antonio Fernós Isern as main editors, with an editorial staff of 13 divisional heads (4). In 1927, the HD leadership incorporated the first Director of the STM, Robert A. Lambert, as an associate editor to an editorial staff of 5 members plus a "contributing" HD staff, which transformed the bulletin into an "official organ" for both institutions. Its title was modified to emphasize "the two most

important aspects of medicine" on the Island, and aligned the publication's objectives with those of the STM (*Porto Rico Review of Public Health and Tropical Medicine*) (5).

The publication became a Journal instead of a "Review" (as it was also called) in 1929, with fully scientific format, and since then was issued on a quarterly basis (6). The Journal's administrative office moved from the HD to the STM. In 1932-33, the STM-Journal received its definitive name, *The Puerto Rico Journal of Public Health and Tropical Medicine*, and became a bilingual journal (English/Spanish) under an editorial board composed of members from the two participant institutions (7). After a few years, the health news, reviews, abstracts, and HD reports sections were eliminated-the last remnants of the once

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“popular medical journal.” Since 1938, the STM-Journal was published by Columbia instead of the HD. In its last phase (1942-50), after a long interregnum (1933-42, the period during which Eduardo Garrido Morales was Commissioner) (8), the editorial composition continued with a format of “joint editors” from the two institutions, but for the first time the STM director served as the principal editor (9). Interestingly, this event appears to be correlated with an internal change within the STM: it was the first time in 16 years that the director was Puerto Rican—the last sign of a protracted medical and political struggle with Columbia University (10). It must be noted that Columbia’s involvement in the UPR-STM joint venture ended in 1948 (11).

Although members of the STM community of scholars published in local and overseas scientific journals, the Journal became the main vessel for publication of their basic and clinical research since September 1929. The STM also published a set of eleven volumes of Collected Papers compiled by year (1926-1938) for complimentary institutional distribution, which included reprints of all published publications by faculty members. Collected Papers or Transactions served a similar function in other institutions of tropical medicine (12). The STM-Journal is considered the principal source of the history of science articles due to its lifetime coverage and type of publications, while the Collected Papers are viewed as indispensable supplementary tools (13). Locally, the topics and contents of the Journal had a magnified echo in the *Boletín de la Asociación Médica de Puerto Rico*, but served mainly as a secondary avenue for the publication of conferences, reviews and reports of preliminary research (14).

The historical period of the STM (1926-1949) was coeval with the STM-Journal (1925-1950), which comprised of the full-blown era of tropical medicine on the Island during the second quarter of the 20th century. Their conjoint ending in the middle of the century attests to the intrinsic connection of the School and its Journal and to the twilight of tropical medicine in Puerto Rico (15). In 1949-50, the graduate research STM was forced to stray off the tropical path, and a medical school started its own professional trail. The field of public health, imprinted in the Journal’s name, continued its presence as a department of the new medical school and eventually, in 1955, it became an autonomous graduate and professional school. Tropical medicine maintained some notable continuity within the medical school (mainly through the Departments of Microbiology, Medical Zoology, Biochemistry and Nutrition, and Pathology), but primarily was devoted to basic science research projects related to already locally-eradicated or -phased out tropical diseases (e.g., malaria and schistosomiasis), and to noteworthy local nutritional studies and international consultation in tropical pathology. As the discipline of tropical medicine faded out, contemporary biomedical sciences established their hegemony. This historical process left the new school in a state of scientific and clinical fragility, ill-equipped to address the challenges of recurrent (e.g., dengue) and emergent (e.g., chikungunya and zika) tropical diseases that ravage the

Island up to the present—a kind of tropical obliviousness in need of an explanation (16).

As a historical inspired by-product of the STM-Journal, the *Puerto Rico Health Sciences Journal* (PRHSJ), published by the UPR Medical Sciences Campus, was founded in 1982. While acknowledging “worldwide recognition” to the STM-Journal, the new publication affirmed that “the conquest and control of tropical diseases” led the government and the University to focus their attention in health manpower provision. At that time, the “main goal” of the nascent PRHSJ was “to provide a forum for the early publication of scientific work,” and a publication venue for young researchers and for articles with scientific merit that were not accepted in “mainland journals.” In a sense, it contrasted the prestigious historicity of the STM-Journal with the modesty of this brand-new enterprise (17). The PRHSJ is a mature publication today. It is also the venue of this journal’s story.

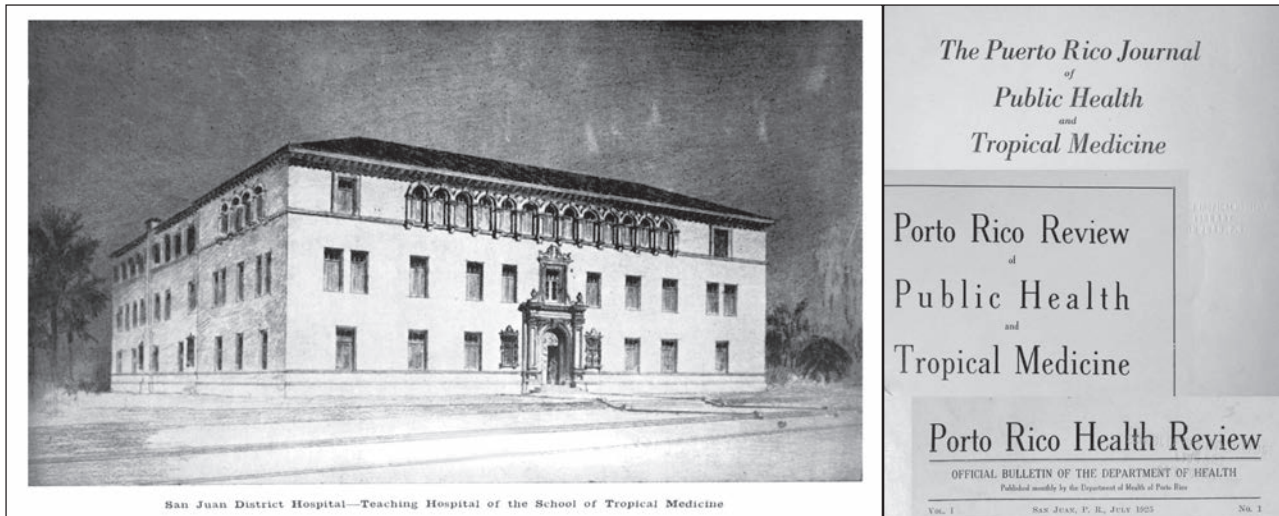
Tropical Medicine Journals

The first journals that dealt mainly, but not exclusively, with tropical diseases were of the following types: military and naval medicine (1863-1870s), medical Brazilian (1866) or European (1890-1896), and British and U.S. scientific (1883-1906) (18). The primeval *Annals of Military and Naval Surgery and Tropical Medicine and Hygiene* (1863, only one volume), which first bore the signature of tropical medicine, was edited by a private publisher but embraced the experience of British medical officers from “all parts of the world.” Patrick Manson published his 1878 seminal papers on mosquitoes as vectors for filariasis in the Chinese Medical Reports (1870s). Interestingly, these journals were based both in metropolitan centered areas and in colonial peripheral regions—Brazil is an exceptional case (19).

British and U.S. journals on tropical medicine and hygiene have been published since 1898, in the metropolis and in their colonial possessions or dominions. Of the eight British and U.S. journals, four originated under personal sponsorship, two were society sponsored, one was school promoted, and one government supported (20). The *Transactions of the Royal Society of Tropical Medicine and Hygiene* (1907) is still considered one of the “greatest current journals” in the specialty “in terms of annual output of articles” (21).

The non-British European journals were mainly sponsored by research and academic institutions or by professional societies of tropical medicine (22). Latin American journals in the field were mostly supported by universities and professional societies, and few were personal or government sponsored publications (23).

With respect to present tropical medicine international journals, an informal internet survey shows that: first, the field is alive and well in terms of publications; second, most of them are independently supported (i.e., publication businesses); and third, few of them are society or school sponsored (24). The current use of such correlated terms as “international health,” “global health,” and “neglected tropical diseases” implies a subtle change of meaning in the historical concepts of tropical medicine and diseases (25).



Left figure: San Juan District Hospital. *Porto Rico Rev Public Health Trop Med* 1927, Vol. III, p. 94. Right figure: three STM-Journal Covers. Special Collections, Conrado F. Asenjo Library, MSC, UPR. Photos taken by Neftalí Rosario Rojas, Medical Photographer, Collaboration of the Center for Technical Support in Academia, Deanship for Academic Affairs, MSC, UPR.

Bibliometric and citation studies in journals of tropical medicine show the following patterns (26): a) after mid 20th century the discipline expanded further and new journals emerged; b) most of the published scientific studies are still being done in the ‘developed’ world; c) small bibliographic citation scattering (high concentration in few journals) and mostly in English; d) language bias or stylistic issues affect the participation of authors from the periphery; and e) impact indexes favor the submission rate of major international journals while lowering the quality of minor local journals (27).

The STM-Journal

The STM scientific journal had five main stages. First (1925-1927), it emerged as an official monthly bulletin of the HD. Second (1927-1929), it followed a transitional phase of mutual collaboration in which the HD integrated the STM, and the publication’s name reflected the main fields of public health and tropical medicine. Third (1929-32), it then went through a transformational phase in which the Journal acquired a sharper scientific focus as it changed to a quarterly science journal. Fourth (1932-42), the STM-Journal became a fully bilingual publication and acquired its definitive name; it also moved its administrative office to the STM. Fifth (1942-50), the final phase in which the STM-Puerto Rican Director, Pablo Morales Otero, became the first principal editor until the Journal-School’s dual dissolution. Table 1 summarizes these stages and events.

The review was founded a year before the inauguration of the STM. In the 1925 Report of the Commissioner of Health of Puerto Rico (28), the nature of *The Porto Rico Health Review* was described:

Besides the scientific articles which appear from time to time by the members of the editorial staff and those articles which deal with the Public Health problems of Porto Rico, the work

Table 1. Stages of the STM-Journal

Stage	Nature	Years	Volumes	Event	Label
First	HD-Bulletin	1925-27	I-II	Monthly	Review
Second	Transitional	1927-29	III-IV	STM integration	PH/TM
Third	Science J.	1929-32	V-VII	Quarterly	Journal
Fourth	Bilingual	1932-42	VIII-XVII	STM Locale (Columbia Published)	Puerto Rico
Fifth	Bilingual	1942-50	XVIII-XXVI	STM Editorship	PRJPHTM

of the Department of Health is fully discussed and analyzed and all the statistical reports from the different bureaus are summarized and included in each month’s issue.

The objectives of the original bulletin also were announced in 1927, when the publication was transformed into a conjoint journal (29). At the time, its sanitary goals were to provide information in “preventive medicine” to health officers and the public and to share the work of the HD with the rest of the world. The objectives of the new collaborative project with the STM were then pondered as ‘opportunities,’ albeit temporary or ambiguous. It was thought that the opening of the STM brought to the review a new opportunity for service “in providing a medium for the prompt publication of lectures by visiting scientists, preliminary reports of investigations, notices of courses offered...” However, it also was expected that the STM would eventually find a more proper avenue for “detailed scientific studies not suited for publication in a popular medical journal.” They also mentioned that the need of a bulletin “will remain” (30).

The bulletin and popular medical nature of the original publication was gradually effaced as the scientific nature of the STM-Journal evolved and predominated. The benefits of the change were its congruence with the scientific nature and priorities of the STM, while the loss in the richness of historical

sociocultural information, as reflected in the health news and opinions and in the accessibility of governmental reports, reduced the journal's importance to practicing physicians and health workers at the time-and also its representational significance for historians.

The transformation of the publication with its new designation as a Journal and with a scientific scholarly orientation occurred under the STM directorship of Earl B. McKinley (1928-31), while still under the HD leadership of Commissioner Ortiz and Assistant Commissioner Fernós Isern. In McKinley's "review of research during the third year (1928-1929)" (31), he stated:

One of the outstanding events of the past year has been the beginning of our new Journal... In order to facilitate the publication of the new Journal its headquarters have been moved to the School of Tropical Medicine... Henceforth the Porto Rico Journal of Public Health and Tropical Medicine will serve as the principal medium for publications from the School.

This statement leaves no doubt about the relevance of the change: the publication had become the STM's "new Journal" under the aegis of the administration of the School and mainly serving a scientific purpose (32).

Organization: Form, Language, and Sections

During the monthly bulletin stage (1925-27) the review was distributed free of charge. With the change to a STM's administration and published quarterly, the cost of each issue increased gradually (33). The size varied with time until it reached a stable form (34). The pages per volume were around 530 through the lifetime of the Journal, with the exception of the last volume which tripled to 1,950 pages. These apparent trivial material aspects of price and form reveal interesting organizational impacts such as: science conversion, location changes, new publishers or editors, and, at the end, a closure incremental effect.

In terms of language, the STM-Journal was first published in English (1925-32) and, as it evolved, it became simultaneously bilingual with some exceptions (1932-50). Language use could be a tangible asset for a journal with international aspirations, but in a colonial possession the preference for the language of the empire in an official HD-Bulletin in 1925 appears to be a choice devoid of much discussion at the time. The use of the name "Porto Rico" in the journal's title has also a colonial narrative. As historian Gervasio Luis García asked, "What's in a name?"-a form of domination (35). The restitution of the proper name of the Island in the STM-Journal's title and its compelling conversion into a bilingual publication in 1932 was decided by the new Health Commissioner, Antonio Fernós Isern, after the U.S. Senate approved a joint resolution in 1930 that restored the diphthong. Simultaneous bilingualism definitely expanded the scientific and cultural horizons of the STM-Journal, particularly with the idea of Pan-Americanization still alive in the metropolitan intellectual climate of the era. An unintended benefit of the use of dual language in the Journal was the significant impact that it had in the refinement and standardization of medical nomenclature, since

proper technical use in both languages was fostered. It must be noted that from its beginning the STM offered graduate courses in both languages. Thus, whether bilingualism was one of the aims of the mutual UPR-Columbia collaborative project or just a sociocultural eventual community reality, or both, should be further explored (36).

The Assistant Commissioner was chief of the editorial staff in the first year of the review. During the second year the Commissioner was depicted as Editor and his Assistant was Associate Editor; it also had a Managing Editor. The bulletin was clearly prepared with the collaboration of the staff and other health professionals. It included several permanent sections: Reviews of Reviews, Abstracts from the Rockefeller Foundation, News or Brief News Notes, Reports by directors of HD Divisions or other public health institutions, Sanitary Rules and Regulations, and Statistical Reports (37).

The process of elimination of these sections was irregular but persistent: a) the Sanitary Rules and Regulations and the HD-Reports were first excluded in 1927; b) the Review of Reviews changed to Book Reviews and then were phased out in 1931; c) the Brief News Notes changed to News Items in 1929 and were eradicated by 1931; d) the Rockefeller Foundation abstracts ended in 1928-29 and reappeared as Abstracts of Current Literature in 1930, and finally ended in 1932; and e) the most durable section was the Statistical Reports that survived until 1933 (38). The changes in format follow these correlative events: a) two in 1927 (STM incorporation); b) two in 1931 and one in 1932 (after science conversion and before language change); and c) the last one in 1933-into a simple and rigid frame: almost only articles.

In the first year, there were signed (75) as well as unsigned articles (8); the unsigned papers were mostly about meetings and conferences, with some educational exceptions. Early in the second year, under the heading of "Voluntary Contributions," it was announced: "This Review will be glad to receive articles for publication... It is especially interested in contributions from the medical profession particularly from those who are competent to discuss public health matters." Clearly, it prioritized medical contributions from authors with sanitary expertise.

The first year of the bulletin was enriched with photos of institutions, field images, health professionals, and patients; it also included maps and diagrams which persisted for some time, but with very few in the third year. After the foundational years the only figures were technical (e.g., tables, statistical distributions, specimens, research lists, diagrams and places, and some health maps). In the long term, there were very few editorials and some obituaries.

Authorship

The process of transformation from a sanitary bulletin to a scientific journal is clearly depicted in a sample of the origin of authors by institution: a) First Stage from 1925-26, where almost all came from the HD; b) Second Stage, from 1927-28,

with a majority already stemming from the STM and Columbia (visiting professors), to a Third Stage, from 1931-32, in which very few were from the HD; c) Fourth Stage from 1932-33, with the majority from the STM, but with a significant increase from other local and international institutions; and, finally, d) Fifth Stage from 1942-44, with none from the HD or Columbia; however, we still find two Columbia and two HD authors in later years. The decrease in articles from visiting professors from Columbia is evident since none appeared from 1938-39 to 1943-44 (World War II years, from 1939-45; the U.S. entered the war at the end of 1941) (39). However, this reduction in Columbia's papers reflected a waning of mutual interest and collaboration throughout the years. This finding will be addressed in the forthcoming articles.

News about the establishment of the STM, the construction of its building, and its inauguration appeared in the first two years of the bulletin. The second year (1926-27) was a transitional phase since by then we find eight authors from the STM and one preliminary report from the STM Director. During the first six years of the Journal, the Health Commissioner published eight articles and the Assistant Commissioner six articles-most of them on public health topics. As the STM-Journal acquired its scientific character, the number of authors decreased, but the authorship became more institutionally and geographically diversified.

Main or first authors of papers in the STM-Journal (all volumes, 518 articles) came from the following institutional categories: 1) STM-professors (45%); 2) HD-personnel (18%); 3) STM-visiting professors from Columbia or other academic centers (10%); 4) international institutions (health or academic) (6%); 5) U.S. institutions (e.g., other universities, NIH, Department of Agriculture) (5%); 6) Rockefeller Foundation (5%); 7) federal institutions in P.R. (e.g., P.R.R.A., military medical corps, U.S.P.H.S.) (4%); 8) Presbyterian Hospital (3%); 9) other local institutions (e.g., public and private hospitals, Planning Board) (1.5%); and 9) other U.P.R. centers (1%) (40).

HD authorship decreased gradually from 1926 to 1936, but its presence continued until the last number-from 86% in 1925-36, to 14% in 1939-50. Rockefeller authors worked in collaboration with the HD or were members of their International Division, and their papers as main authors were published mainly before the start of the third stage (1929 science conversion; 1925-29, 85%). Visiting professors published more frequently (87%) during the 1926-27 to 1935-36 period, decreasing significantly after that time, particularly those clearly identified with Columbia. The participation of authors from federal institutions on the Island started mainly in 1938-39, with papers from the P.R.R.A. and the military corps, including the U.S.P.H.S., and their contribution lasted until the next to last number. International authors had a persistent and homogeneous presence during the last two stages, starting in 1930-31 until the last volume (1950). Only six papers by U.P.R. Río Piedras Campus professors (4 males

and one female) were published-two of these professors were eventually transferred to the STM (41).

The data shows that the participation of external authors doubled from 20-28% in the 1920s to 40% in 1932-40, with a return to the base level in 1940-43 war years (23%), and back again to a high participation in the last decade (39%). The international participation went from one or two articles per volume from 1930 to 1938, decreasing to zero in the period of 1938-41, and then increasing to an average of two articles per volume in the years of 1941-50 with the highest participation of 4 articles in 1945-47. Contrary to the diminishing presence of U.S. visiting professors, international participation increased during the war years (1941-46) maintaining its collaboration until the last volume. Thus, the STM-Journal was highly successful in attracting the contribution of their institutional cadre of visiting professors (10%) and of more external local, U.S., and international authors (15%), many of them members of important academic and scientific institutions. Since the STM was integrated into the publication, its internal community of scholars participated as authors of the Journal in almost an average of 10 articles per volume versus a general average of 19 papers per volume.

The first two published research studies by a senior male author and a female assistant were from the STM's Chemistry Department, Donald H. Cook and Trina Rivera, and they appeared in the first year after the integration of the STM (42). With respect to the participation of female writers in the Journal, the main findings by stages are as follows. HD authorship characterized the foundational review moment. The transitional and science conversion phases (1927-32) were defined by secondary authorship of laboratory assistants (chemistry and mycology) and by first authorship of physicians (clinical pathology and dermatology). Secondary authorship papers by P.R.R.A. female writers were frequent in the 1932-42 years. Finally, during the last stage (1943-50), the STM-Journal published nearly 15% of the articles by female authors; three-fourths of them were from the STM (primarily, Clinical Medicine and Medical Zoology departments) (43).

In general, during the initial stage of the publication (1925-27), the main authors with the most publications came from HD-personnel, as expected. They were, first, the Rockefeller Foundation medical malariologist Walter C. Earle with 14 articles, and, second, the Director of the HD-Biological Laboratory, Pablo Morales Otero, a doctor in medicine who specialized in bacteriology and became future professor and Director of the STM, with 8 articles in different topics (44). The first article by a STM-professor in the Journal was written by one of the first scientists from Columbia, chemist Donald H. Cook (i.e., Vitamin studies in P.R.); a paper that started an extensive productive line of research by members of the Chemistry Department on the Puerto Rican diet.

During the second and third stages (1927-32), the most productive STM-Journal research authors, after the integration of the STM, were from that institution. They are: 1) bacteriologist

Pablo Morales Otero with 11 articles (mainly on the clinical use of the Wasserman Reaction test); 2) parasitologist William A. Hoffman with 10 papers (e.g., filariasis, schistosomiasis); and 3) tropical medicine and mycologist Bailey K. Ashford, also with 10 articles (e.g., mycology, sprue). The fourth stage (1933-42) shows three STM's researchers with more publications: 1) Pablo Morales Otero with 12 papers (e.g., a series on Health and Socio-economic Studies in P.R.); 2) dermatologist Arturo L. Carrión has 9 articles (mainly dermatomycosis); and 3) medical parasitologist Rafael Rodríguez Molina with 9 articles in different topics. Finally, in the last stage (1942-50), all writers with the most articles were from the STM: 1) tropical medicine and medical supervisor F. Hernández Morales with 25 highly diverse publications (particularly schistosomiasis); 2) parasitologist José F. Maldonado with 9 papers (mainly schistosomiasis); and 3) parasitologist José Oliver González has 8 papers (mostly schistosomiasis) (45).

Overall, through the lifetime of the Journal, the most prolific authors were: 1) HD/STM-medical bacteriologist Pablo Morales Otero (31 papers); 2) STM-tropical medicine and clinical supervisor F. Hernández Morales (29); 3) HD/STM-medical malariologist Walter C. Earle (20); and 4) HD/STM-clinical pathologist Oscar Costa Mandry (16) and STM-parasitologist William A. Hoffman (16). Morales Otero and Earle were more present in the first three stages, while Hernández Morales dominated the last one. The largely moderate presence of Costa Mandry and Hoffman was concentrated in the middle stages (46).

Content Analysis

A. Diseases

The diseases covered throughout the lifetime of the STM-Journal (1925-50), by order of frequency, are: Group I: schistosomiasis (59) and malaria (38); Group II: filariasis (24), tuberculosis (18), uncinariasis (17), and sprue (17); Group III: leprosy (14) and dermatomycosis (14); and Group IV: syphilis (11) and dysentery (10). Table 2 summarizes the content analysis of the topics in the STM-Journal.

With respect to periodicity: a) schistosomiasis was by far the most homogeneously distributed in the Journal throughout the years; b) malaria was present in two moments, an initial more frequent phase (1925-1929) and what seems like a later eradication lower phase (1936-47); c) curiously, filariasis initially follows a widely distributed pattern (1925-40), with an intermission phase with no papers, and a more concentrated moment at the end (1945-50); d) uncinariasis, dermatomycosis, and tuberculosis showed a similar pattern of an important presence in the first two thirds (1925-40) of the lifetime of the Journal to losing their presence after 1940; e) leprosy almost follows a similar trend but it starts to fade earlier (1932) and disappeared completely in 1938; f) sprue depicts a two modal moments, a first one mostly associated with Bailey K. Ashford (1927-32) and a second more frequent one that outlasted his death (1938-45); and g) syphilis and dysentery, with the fewest

frequencies, both manifest an irregular but persistent pattern—however syphilis followed a pattern like malaria of two periods with the last one during the war years.

In terms of diseases, it is clear that what were considered traditionally as tropical maladies characterized the nature of the STM-Journal—with the clearest exception of syphilis. A wide variety of tropical (e.g., yaws, yellow fever, plague) (47) and non-tropical diseases (e.g., neoplasm, medication poisoning, thrombosis) also were subject of consideration in the Journal. At times, a journal's issue was dedicated exclusively to one disease (e.g., malaria, filariasis, and brucellosis). Some diseases were more associated with a specific researcher at a particular period. Those cases will be the subject of the forthcoming articles.

B. Public Health

In the second area of impact of the STM-Journal, public health, the content analysis shows the following results by order of frequencies. Group I: health conditions (22) and epidemiology (17); Group II: nutrition (13) and vital statistics (11); Group III: disease control (8) and socioeconomic studies (7); Group IV: environmental (5), medical aspects (5), and food problems (4); and Group V: health organization (4), disease outbreaks (3), and rural sanitation (3).

The theme of public health had a wide and homogeneous distribution all along, with the exception of one year (1937-38), with no papers, and two years (1942-43 & 1950), each with one paper. In terms of the trend patterns by group of categories, the most interesting ones are: a) health conditions studies had an initial lesser mode (1925-31) and later a larger one (1938-50), which could reflect a particular sanitary interest on the general socioeconomic conditions of the Island; b) interestingly, socioeconomic, epidemiological, and vital statistics papers followed this same pattern; c) nutritional studies, which also showed this trend, reflect more the particular contribution of STM chemical researchers; and, finally, d) the epidemiological articles included five rat-flea surveys, six earlier epidemiology of tuberculosis and leprosy, three hookworm and intestinal parasites surveys, and one study on malaria. Some numbers of the STM-Journal were dedicated exclusively to a particular topic (e.g., Health and Socio-economic Studies in P.R. and P.R. Public Health Association).

C. Science

The results of the content analysis of the scientific character of the STM-Journal were (48), first, no basic science papers were found in the first two stages of the Journal (1925-29), except for the allied sciences of veterinary and laboratory medicine, which corroborates the transformation locus of the bulletin into a science journal as of volume five (1929-30). Second, from there on, the homogeneous and persistent presence of basic science articles definitely characterizes the rest of the life of the STM-Journal. Third, biochemistry, with emphasis on nutrition, had the singular largest number of published research studies, followed by the fundamental

Table 2. Content analysis of the topics in the STM-Journal*

A. Diseases (n=222)	
I. Higher (n=97)	Schistosomiasis (59), Malaria (38)
II. Moderate (n=76)	Filariasis (24), Tuberculosis (18), Uncinariasis (17), Sprue (17)
III. Low (n=28)	Leprosy (14), Dermatomycosis (14)
IV. Fewer (n=21)	Syphilis (11), Dysentery (10)
B. Public Health (n=110)	
I. Higher (n=39)	Health Conditions (22), Epidemiology (17)
II. Moderate (n=24)	Nutrition (13), Vital Statistics (11)
III. Low (n=15)	Disease Control (8), Socioeconomic Studies (7)
IV. Fewer (n=24)	Environmental (5), Medical Aspects (5), Food Problems (4), Health Organization (4), Disease Outbreaks (3), Rural Sanitation (3)
C. Science (n=143)	
I. Basic sciences (n=39)	Parasitology (n=16), Biochemistry (n=14), Bacteriology (n=7), Mycology (2)
II. Biological studies (n=25)	Biological organisms (14), Experimental Animal Studies (11)
III. General sciences (n=9)	Zoology (5), Botany (4)
IV. Allied sciences (n=42)	Laboratory Medicine (31), Veterinary Medicine (11)
V. Others (n=28)	Therapeutic Studies (11), Normal parameters and organic states (11), Environmental (3), Editorials (3)

*Grouped by number of articles. Do not include categories with very few articles. Of a total of 518 articles in the Journal, it includes 475.

scientific disciplines of tropical medicine, parasitology and bacteriology, and by the most general scientific disciplines of zoology and botany. Fourth, experimental animal studies, besides two earlier papers (1929-30), were more prevalent in 1936-48; biological studies of organisms followed a similar pattern. This type of experimental and biological studies should be noted for further analysis. Fifth, environmental (e.g., annual rainfall, atmospheric medical effects, pollution) and therapeutic studies were almost as frequent as normal medical parameters and organic states papers. Seventh, scientific editorials were few and earliest (n=3, 1929-32), which manifest an increase in the avoidance of debates or critical comments. Finally, laboratory medicine, with 31 papers, was the most frequent category and widely homogeneously distributed, while veterinary medicine, with 11 articles, was more concentrated in earlier phases (1925-29).

Conclusions

The story of the STM-Journal describes the process of transformation by which a popular medical journal, an official organ of the HD, became the main vessel for the publication of the scientific studies conducted by professors and researchers of the UPR-STM. It illustrates the foundational connection that existed between a health government agency and a tropical medicine research school of the public university under the auspices of a metropolitan university in the second quarter of the 20th century in Puerto Rico. It also anticipates the need to inquire further about the ambience and productivity of the community of health researchers and professionals and how

they did research, teaching, treating patients, and publishing around the triad of research graduate school-university hospital-scientific journal, and expanded their scientific reach.

By 1914, tropical medicine had not yet sufficiently differentiated to stimulate the development of specialized journals in subfields of the discipline. However, early European and U.S. journals are still highly successful today, and new global and regional journals are continuously emerging. Most contemporary tropical medicine international journals are independently supported (e.g., publication business), and a few are either society or school sponsored. Government promoted journals are very rare in the history of the genre. Interestingly, the STM-Journal was a hybrid: a government and school sponsored publication.

The diversity found in the historical publication patterns in the Journal related to tropical diseases illustrates the particular research interests of the STM community of scholars and the prevalent health conditions on the Island. Schistosomiasis was a central and constant focus of research in the STM, while malaria was also of great interest in particular moments—two major tropical parasitic infections at the time (49). Interest in other important tropical maladies diminished after the 1940s.

The biochemistry of nutrition and the Puerto Rican diet was one of the most productive lines of research in the STM. Health conditions and socioeconomic aspects were of particular interest in two distinct periods of the Journal, at earlier and later moments; epidemiological and vital statistics papers followed the same pattern—a correlation that needs to be explored. The analysis of content has proven that the Journal was committed to its two most important editorial objectives: the study of tropical medicine and public health, while remaining true to its scientific nature.

The analysis of the STM-Journal depicts the periodicity of a series of stages and highlights major symbolic events that delve into the understanding of the science produced by a collaborative exemplar of modern medical science. The Journal's story also marks some particular events and processes that reflect controversial and conflictive aspects of this relevant scientific historical case. The inquiries related to authorship and the main areas of impact of the Journal (diseases, public health, and science) provide a useful tool for the clarification of the history of tropical medicine during the first half of the 20th century in Puerto Rico. It is not only about its rise and growth, but also about its sunset and oblivion.

Resumen

Este artículo presenta la historia de la revista científica de la Escuela de Medicina Tropical (EMT) de la Universidad de Puerto Rico, bajo los auspicios de Columbia University: *The Puerto Rico Journal of Public Health and Tropical Medicine*. Este es el tercer ensayo de una serie histórica sobre la EMT, e incluye información relevante que provee sostén a próximos artículos sobre las contribuciones científicas de la institución. La revista científica de la EMT, precursora del *Puerto Rico Health Sciences Journal*, tuvo cinco etapas principales. Primera (1925-1927), se originó como un boletín oficial del Departamento de Salud (*Porto Rico Health Review*). Segunda (1927-1929), se convirtió en un proyecto de colaboración entre el Departamento de Salud y la EMT y el título de la revista incorporó los términos de salud pública y medicina tropical. Tercera (1929-1932), adquirió un formato riguroso y se convirtió en una publicación trimestral propiamente científica. Cuarta (1932-1942), se convirtió en una revista bilingüe y adquirió su nombre definitivo. Quinta (1942-1950), la etapa final en la cual el primer director puertorriqueño se convirtió en el principal editor hasta el momento de su disolución. Los análisis de autoría y de contenido de los tópicos de enfermedades, salud pública, y ciencias básicas de la publicación, contribuyen a la caracterización de la medicina tropical durante la primera mitad del siglo XX en Puerto Rico. El artículo destaca eventos simbólicos y representaciones importantes que facilitan el entendimiento de un caso de colaboración de la modernidad de la ciencia.

References

- For other pertinent journal histories, see: García Muñiz H, Vélez Natal B. En el cincuentenario de "Caribbean Studies": Algunas notas sobre las universidades del Caribe y sus revistas académicas. *Caribb Stud* 2011; 39:3-41. Mayo Santana R. Buhiti: Memoria histórica de educación médica en Puerto Rico. Buhiti 2014; Feb.:2-18.
- Mayo Santana R, Rabionet SE, Peña-Carro L, Serrano AE. Marvels and Shadows: Science and Education at the University of Puerto Rico School of Tropical Medicine under the Auspices of Columbia University: An Introduction. *PR Health Sci J* 2016; 35:49-52. Mayo Santana R, Peña-Carro L, Rabionet SE. The historical antecedents of the UPR School of Tropical Medicine. *P R Health Sci J* 2016; 35:1-9. Rabionet SE. The educational legacy of the UPR School of Tropical Medicine: Curricula, faculty, students (1926-1949). *P R Health Sci J* 2016; 35:125-133.
- Five clarification notes: 1) Journal short form names in text: for consistency, the name of 'Bulletin' (bulletin) or 'Review' (review), as it was called at the time, will be used for the period of the first two years (1925-27) when the publication was an official bulletin of the Health Department; and the names of 'STM-Journal' or 'Journal' will be used for the lifetime of the publication (1925-50). 2) Journal four official titles (and author abbreviations for references): a) Porto Rico Health Review (*Porto Rico Health Rev* Vols. I-II, 1925-27); b) Porto Rico Review of Public Health and Tropical Medicine (*Porto Rico Rev Public Health Trop Med* Vols. III-IV, 1927-29); c) The Porto Rico Journal of Public Health and Tropical Medicine (*Porto Rico J Public Health Trop Med* Vols. V-VII, 1929-32); and d) The Puerto Rico Journal of Public Health and Tropical Medicine (*P R J Public Health Trop Med* Vols. VIII-XXVI, 1932-50). 3) Monthly and quarterly volume periods: from 1925-29 (Vols. I-IV), the Journal's volumes ran off monthly from July to June; and from 1929-50 (Vols. V-XXVI), the Journal was published quarterly during the months of September, December, March, and June. 4) The Journal never ceased to be a "joint editorship" HD-STM publication, but in Vol. XVIII of 1942-43 (p. 2) instead of been stated in the editorial board page that it was published "by the Department of Health... and the School of Tropical Medicine," it said that it was "published for" the STM "and with cooperation" of the HD. The pertinent coeval editorial relations between the names of Health Commissioners and the STM Directors were: a) Commissioner Pedro N. Ortiz, M.D. (1923-31) - Director Robert A. Lambert, M.D., Pathology (1926-28); b) Commissioner Antonio Fernós Isern (1931-33) - Director Earl B. McKinley, M.D., Bacteriology (1928-31); c) Commissioner Eduardo Garrido Morales (1933-42) - Director George W. Bachman, PhD, Parasitology (1931-42); and d) Commissioners A. Fernós Isern (1942-46) and Juan A. Pons (1946-47) - Directors Pablo Morales Otero, M.D., Bacteriology (1942-April 1949) and Enrique Koppisch, M.D., Pathology (Interim, May-June 1949). 5) All the quantitative data reported in this article was paper-and-pencil calculated by the author some time ago and has been recently rechecked and expanded. Today, the STM-Journal's Web site (i.e., Libreria) has been renovated and quantitative summary data has been incorporated (e.g., frequencies by authors and subjects of publications) which facilitate and expedite user's inquiries. The statistical procedures used in this article reflect particular research oriented categories and classifications which are not necessarily comparable with those of the Journal's Internet site, in the strict sense of data processing and management. It is also clear that the automatic discovery tools of Libreria are a useful guide for article selection and are not intended to substitute the responsibility of the researcher with data recollection and reliability. Nevertheless, in general, pertinent descriptive statistics in this article (e.g., frequencies of diseases) are not so distinct to those portrayed on the Journal's Web site, and the author has verified that they do not alter or contradict the reported main findings and interpretations of the ordinal data.
- STM-Journal editorial boards formats, as stated in the first number of each volume. First Format: a) Vol. I, 1925-26, Editor (Health Commissioner Pedro N. Ortiz), Associate Editor (Assistant Commissioner Antonio Fernós Isern), plus an Editorial Staff of 11 divisional heads plus a Veterinary Inspector and a Physician in Charge of Malaria Control; and b) Vol. II, 1926-27, an Editorial Staff of five members, Editor and Associate Editor, two HD divisional heads (J. Rodríguez Pastor and Manuel A. Pérez), and one Managing Editor (Edith M. Rivera), plus a Contributing Staff of 13 HD personnel. Second Format: Vols. III-IV, 1927-29, an Editorial Staff of seven members composed of an Editor in Chief (Commissioner Ortiz), two Associate Editors (Assistant Commissioner Fernós and STM Director Robert A. Lambert), three divisional heads (Pastor, Pérez and Ramón Lavandero) and the Managing Editor, plus a Contributing Staff of 13 HD personnel and three STM professors (Donald H. Cook, Chemistry; Charles Weiss, Bacteriology; and William A. Hoffman, Parasitology). Third Format: Vols. V-VI, 1929-31, an Editorial Board of three members: Commissioner Ortiz, Assistant Commissioner Fernós, and STM Director E.B. McKinley. Fourth Format: Vol. VII, 1931-32, an Editorial Board of two Joint Editors at the same level (Commissioner Fernós Isern and STM Director George W. Bachman), the Sub-Commissioner Ramón J. Sifre, and a Copy Editor (C.M. Locke). Fifth Format: Vol. VIII, 1932-33, an Editorial Board of the previous Joint Editors plus two HD personnel (Assistant Comm. Sifre & Lavandero), two STM professors (A.L. Carrión, Mycology and P. Morales Otero, Bacteriology), and the Copy Editor. Sixth Format: Vols. IX-XVII, 1933-42, an Editorial Board of two Joint Editors in a hierarchical structure (Commissioner Eduardo Garrido Morales and STM Director Bachman), plus two HD Assistant Commissioners (Antonio Arbona and Pedro Malaret), two STM professors (Carrión and Morales Otero), and two Copy Editors (Lavandero, Spanish, and Locke, English). Seventh Format: Vols. XVIII-XXIV, 1942-49 (probably until the final Vol. XXVI, 1950) an Editorial Board of two Joint Editors in a hierarchical structure (STM Director Morales Otero and Fernós Isern, Department of Health) plus two HD members (Tomás Blanco and Rafael A. Vilar), two STM members (Carrión and Enrique Koppisch, Pathology), and two Copy Editors (Lavandero, Spanish, and Margarita Domenech, English).

5. Porto Rico Rev Public Health Trop Med 1927-28; III:4.
6. Porto Rico J Public Health Trop Med 1929-30; V:2.
7. P R J Public Health Trop Med 1932-33; VIII: inside front cover.
8. The term “interregnum” is used to dramatize the period of Garrido Morales: first, to mark the conflictive nature of the administrative change in the HD and the related tense relationship between Fernós Isern and Garrido Morales, which could had an impact in the Journal operations, and second, to bring up the questions if the change in 1933 to a hierarchical format in the STM-Journal joint editorship (see reference 4) and if the creation in 1937 of a new HD Bulletin (see reference 30), under Garrido’s leadership, reflect on some possible controversy in the life of the Journal. See also: Rodríguez Vázquez E. Dr. Antonio Fernós Isern: Obra médica (1915-1946). In: Acevedo HL (ed.) Dr. Antonio Fernós Isern: De médico a constituyente; San Juan, PR, Universidad Interamericana de Puerto Rico, 2014: 241-283.
9. P R J Public Health Trop Med 1942-43; XVIII:2.
10. Ramírez de Arellano AB. The Politics of Medical Education in Puerto Rico; School of Public Health, Columbia University, Doctoral Diss.; 1985:34-62. Ramírez de Arellano AB. La Escuela de Medicina Tropical: Raíces ideológicas e imperativos políticos. *Revista de Historia (PR)* 1986; 2:102-120. Mayo Santana R. La producción científica en la Escuela de Medicina Tropical. IV Cumbre de Historia de las Ciencias de la Salud, Instituto de Historia de las Ciencias de la Salud (IHICIS), Archivo General y Biblioteca Nacional de Puerto Rico, 27 Marzo 2012.
11. Archives and Special Collections, A.C. Long Health Sciences Library of Columbia University. School of Tropical Medicine (San Juan, Puerto Rico). Bill 493 of May 1949, enacted by the P.R. Legislature and approved by the Governor, eliminated the Special Board of Trustee of the School of Tropical Medicine, thus formally bringing to an end the affiliation between Columbia University and the UPR. Archives & Special Collections, Columbia University; see several letters from 1949: April 18 (H.W. Brown to P. Morales Otero), 20 (P. Morales Otero to W.C. Rappleye), 23 (P. Morales Otero to W.C. Rappleye), 27 (W.C. Rappleye to M. Villaronga), and 29 (A.L. Carrión to J. Padín). Enrique Koppisch, Director Interino, Escuela de Medicina Tropical, Último Informe, 30 Junio 1949.
12. Chernin E. The early British and American journals of tropical medicine and hygiene: An informal survey. *Med Hist* 1992; 36:70-83: “Transactions or Papers, comprised collected reprints of papers published by members in many different journals” (p. 9).
13. Source collections: a) Puerto Rico Journal of Public Health and Tropical Medicine, Special Collections, Conrado F. Asenjo Library, UPR-MSU, digitized in Librería; b) Boletín de la Asociación Médica de Puerto Rico, Puerto Rico Medical Association; and c) School of Tropical Medicine of the UPR under the auspices of Columbia University, Collected Papers (1926-1938), Biblioteca Nacional de Puerto Rico, Instituto de Cultura Puertorriqueña.
14. Mayo Santana R. La revista científica como fuente histórica primaria: del Boletín del Departamento de Salud a la Revista de la Escuela de Medicina Tropical. III Cumbre de Historia de las Ciencias de la Salud, Instituto de Historia de las Ciencias de la Salud (IHICIS), Ateneo Puertorriqueño, 23 Marzo 2010.
15. A period spanning from the 1904 Anemia Commissions to the STM termination during the years of 1948-50.
16. The theme of “tropical obliviousness” will be addressed in the next article of the UPR STM historical series, titled: “Paths and images of science: Research practices, representations and legacies at the UPR School of Tropical Medicine.”
17. Haddock L (Editor in Chief). A new journal is born. *The Puerto Rico Health Sciences Journal*. Editorial. *P R Health Sci J* 1982; 1:45-46. Another goal was, “to stimulate the interest of the faculty to publish the findings of their scientific work” (p. 45).
18. The section on tropical medicine journals was based on the following references (see ref. 26, for bibliometric and citation sources): Brennen PW, Davey WP. Citation analysis in the literature of tropical medicine. *Bull Med Libr Assoc* 1978; 66:24-30. Chernin E. The early British and American journals of tropical medicine and hygiene. Gibson SS. Scientific societies and exchange: A facet of the history of scientific communication. *J Libr Hist* 1982; 17:144-163. Levitan KB. Scientific societies and their journals: Biomedical scientists assess the relationship. *Soc Stud Sci* 1979; 9:393-400. Neill DJ. Networks in Tropical Medicine. Internationalism, Colonialism, and the Rise of a Medical Specialty, 1890-1930; Stanford, CA; Stanford University Press, 2012: 33-38 (Journals and Societies). Rossiter MW. Women and the history of scientific communication. *J Libr Hist* 1986; 21:39-59. Williams JR, Bórquez A, Basáñez MG. Hispanic Latin America, Spain and the Spanish-speaking Caribbean: A rich source of reference material from public health, epidemiology and tropical medicine. *Emerg Themes Epidemiol* 2008; 5:17:1-21.
19. The first journals that dealt largely but not exclusively with tropical diseases had four different origins: a) military and naval medicine (*Annals of Military and Naval Surgery and Tropical Medicine and Hygiene*, 1863 & *Medical Reports of the China Imperial Maritime Customs*, 1870s); b) medical-Brazilian (the personal-sponsored *Gazeta Medica da Bahia*, 1866); c) medical-European (e.g., *British Medical Journal*, 1890s; *Janus*, 1896), and d) British and U.S. scientific journals (e.g., *Popular Science Monthly*, 1883; *Journal of the Linnaean Society*, 1878; *Bulletin U.S. Department of Agriculture*, 1893; *Philippine Journal of Science*, 1906). The *Annals of Military and Naval Surgery and Tropical Medicine and Hygiene* was based on regional reports, particularly on the health of troops and mariners, and included articles of a great variety of widely distributed (e.g., syphilis, cholera, dysentery, leprosy, tetanus) and tropical (e.g., yellow fever, malaria, elephantiasis) diseases, as well as sanitary and mortality reports and climatological articles, but only one report on the health of indigenous people.
20. On the history of tropical medicine journals: 1) Journals specialized on tropical medicine and hygiene (or public health) have been published since 1898 in England and the U.S., and in their colonial possessions or dominions; those published around 1914 already were considered “late runners” (ref.: Chernin E. The early British and American journals of tropical medicine and hygiene). 2) On British and U.S. journals published before in the 1870s and 1880s, see (ref.: Chernin E. The early British and American journals of tropical medicine and hygiene): a) in some “obscure publications” (e.g., *Popular Science Monthly*, *Medical Reports of the China Imperial Maritime Customs*, *Journal of the Linnaean Society*, U.S. Department of Agriculture bulletin, *Wellcome Research Laboratory at Khartoum*), and b) in journals “heavy with tropical diseases” (e.g., *China’s Customs Gazette*, *British Medical Journal*, and U.S. *Philippine Journal of Science*). On short-lived tropical medicine British journals at the crossroads of the 19th and 20th centuries, see: a) aborted (*Annals of Tropical Sanitation*, 1911, under the initiative of Ronald Ross); or b) sudden-death publications under the editorship of Patrick Manson (*Hong Kong Medical Society’s Transactions*, ~ 1886; and *Journal of the London School of Tropical Medicine*, 1911-12). 3) The timeline of the tropical medicine British journals at the crossroads of the 19th and 20th centuries were: *Journal of Tropical Medicine* (established in 1898), *Journal of Hygiene* (1901), *Annals of Tropical Medicine and Parasitology* (*Annals*; 1907, *Liverpool School of Tropical Medicine*), *Parasitology* (1908), *Transactions of the Royal Society of Tropical Medicine and Hygiene* (1907), and *Science Progress* (since 1913 until 1932, under Ronald Ross’ editorship). Of the British journals, the *Journal of Tropical Medicine* and the *Transactions of the Royal Society of Tropical Medicine and Hygiene* (1907) remain active today, and the *Liverpool’s Annals* (1907-2011) is currently known as *Pathogens and Global Health* (2012). 4) The U.S. journals are: a) the *American Journal of Tropical Diseases and Preventive Medicine* (New Orleans; 1913-1916); b) the *American Journal of Tropical Medicine and Hygiene* (1921-present); and c) *Tropical Diseases Bulletin* (1912-present). Two of the three U.S. journals are still active today: *American Journal of Tropical Medicine and Hygiene* (1921), and *Tropical Diseases Bulletin* (1912).
21. Brennen PW, Davey WP. Citation analysis in the literature of tropical medicine.
22. On the non-British European journals (ref.: Neill DJ. Networks in Tropical Medicine), see details: Some years after the founding of the Amsterdam-based history of medicine journal, *Janus*, its editor singled out two specialized journals that were “bound to prosper,” because “the urgency of

- colonial questions predetermined their success:" the personal-sponsored British Journal of Tropical Medicine (1898) and the Hamburg institution-based, Archiv für Schiffs-und Tropenhygiene (1897). The Archiv für Schiffs-und Tropenhygiene (1897-1940) was related to the Hamburg's Institute for Marine and Tropical Diseases, established in 1901, now the Bernhard Nocht Institute; the journal was replaced by the Deutsche tropenmedizinische Zeitschrift, 1941-1944; and reappeared in 1949 as the Zeitschrift für tropenmedizinische und Parasitologie. In Portugal, the Archivos d'hygiene e patologia exoticas (1905) was published by the Escola de Medicina Tropical de Lisboa; in 1943, it became known as the Anais do Instituto de medicina tropical. In France, the first independent "major journal" of tropical medicine was the Annales d'hygiène et de médecine coloniales (1898), and by 1908 was complemented by the still active Bulletin de la Société de pathologie exotique, focusing on French research.
23. On Latin America tropical medicine journals, see details: 1) In Latin America, the most prestigious historical publication, Memórias do Instituto Oswaldo Cruz, was founded in 1909 by the Brazilian medical scientist Oswaldo Cruz and it is still active today. The Revista do Instituto de Medicina Tropical de São Paulo, associated with the Instituto de Medicina Tropical and the Universidade de São Paulo, was founded in 1959; and the Revista da Sociedade Brasileira de Medicina Tropical (1967) is an official journal of the Brazilian Society of Tropical Medicine (1962). These three Brazilian journals are institutionally sponsored. In Cuba, the Revista de Medicina Tropical (1900) and its descendant, the Revista de Medicina Tropical y Parasitología (1935), were founded under personal sponsorship by physicians that later were associated with the creation of a tropical medicine society or institute. Today, the field is represented by the government supported, Revista Cubana de Medicina Tropical, founded in 1945. 2) Other active Latin American related publications listed internationally under the area of tropical medicine are, for example, Venezuela, where there are two school sponsored journals (Boletín de Malariología y Salud Ambiental, published by the Instituto de Altos Estudios en Salud Pública; and Kasmera, 1962, a publication of the Universidad del Zulia); and Colombia with a school sponsored journal (Vita, published by the Facultad de Química Farmacéutica, Universidad de Antioquia). As references see: Williams JR, Bórquez A, Basáñez M-G. Hispanic Latin America, Spain and the Spanish-speaking Caribbean; and Revistas Médicas en español de acceso libre; 13 July 2016:1-11 (http://www.gfmer.ch/Medical_journals/Revistas_medicas_acceso-libre.htm).
 24. On present tropical medicine international journals, see details: first, the field is alive and well in terms of publications; second, most of them are independently supported (International Journal of Tropical Medicine and Public Health, International Journal of Tropical Medicine, International Journal of Tropical Diseases and Health, Acta Tropica); and third, few of them are society sponsored (Tropical Medicine and International Health, official journal of the Federation of European Societies of Tropical Medicine and International Health) or school sponsored (Asian Pacific Journal of Tropical Medicine, promoted by the Institute of Tropical Disease, Hainan Medical University, China). There is also the common case of the Canadian Public Health Association (with its journal of public health) that includes a "division of tropical medicine and international health." Several other active related publications are listed under the area of tropical medicine.
 25. Recently, the term "Global Health" has emerged as a "specialty" associated with publications of varied kinds and epochs (e.g., PLoS Neglected Tropical Diseases, 2007; Bulletin of the World Health Organization, 1947). The term "Global Health" is present only in the "List of medical journals," from Wikipedia; 25 July 2016:1-21 (https://en.wikipedia.org/wiki/List_of_medical_journals). Also, the recent idea of the creation of an 'Africa Health Research Institute' to 'tackle' South African epidemics, merging specific disease oriented institutes (i.e., HIV/tuberculosis) sponsored by different international biomedical research institutes at a particular geographical region, exemplifies both current international needs as the vitality of tropical medicine conceptual historicity (ref.: Cohen J. African HIV/tuberculosis institutes merge. Science 2016; 353:332).
 26. For bibliometric and citation analysis of journals of tropical medicine, see these references: Brennen PW, Davey WP. Citation analysis in the literature of tropical medicine. Falagas ME, Karavasiou AI, Bliziotis IA. A bibliometric analysis of global trends of research productivity in tropical medicine. Acta Trop 2006; 99:155-159. Rodrigues Coura J, Willcox, LdeCB. Impact factor, scientific production and quality of Brazilian Medical Journals. Mem Inst Oswaldo Cruz 2003; 98:293-297. Schoonbaert D. Citation patterns in tropical medicine journals. Trop Med Int Health 2004; 9:1142-1150. Smith DR. Citation indexing and the development of academic journal in tropical medicine. Mem Inst Oswaldo Cruz 2008; 103:310-312. Soteriades ES, Falagas ME. A bibliometric analysis in the fields of preventive medicine, occupational and environmental medicine, epidemiology, and public health. BMC Public Health 2006; 3:301:1-8.
 27. A preliminary summary is presented on some bibliometric and citation patterns in journals of tropical medicine: a) by mid 20th century, as former colonies had gained their independence, the tropical medicine discipline expanded further, new journals appeared (e.g., Acta Tropica), and dissemination of information broadened (ref.: Smith DR. Citation indexing and the development of academic journal in tropical medicine); b) between 1995 and 2003, considerable research was conducted in 'developing areas' (ref.: Falagas ME, Karavasiou AI, Bliziotis IA. A bibliometric analysis of global trends); c) however, in 2008, most of the published scientific studies were still being done in the 'developed world,' (ref.: Soteriades ES, Falagas ME. A bibliometric analysis in the fields of preventive medicine, occupational and environmental medicine, epidemiology, and public health) and, apparently, there seemed to be an information gap between a possible seminal finding and actual citation (ref.: Smith DR. Citation indexing and the development of academic journal in tropical medicine); d) an early citation analysis study of the tropical medicine literature found, first, a small bibliographic scattering and a high concentration of articles in a few number of journals, and, second, that English was by far the most common language employed (80%), followed by French (6.5%) and Spanish (4%) (ref.: Brennen PW, Davey WP. Citation analysis in the literature of tropical medicine); e) an examination of a contemporary European society-sponsored journal (Tropical Medicine and International Health), from 1996 to 2003, revealed that the journal, "reflects fairly the research and views of scientist from all regions of the world" (ref.: Schoonbaert D. Citation patterns in tropical medicine journals); f) a study of six of the twelve most important journals in the field, reveals that they tend to mutual citation, but also cite multidisciplinary science and general medicine journals, as well as infectious diseases and parasitology publications-however, the specialty's literature is highly more concentrated and language bias or stylistic issues affect the participation of scientists from 'developing' countries and also had a negative impact on local and regional journals (ref.: Schoonbaert D. Citation patterns in tropical medicine journals); and g) an evaluation of the impact factor (an index of the yearly average number of citations to recent articles) in the production and quality of Brazilian medical journals (including tropical medicine), found that the local scientific community is highly influenced by these types of measures, thus exporting the 'best papers' to foreign journals which contributed to lowering the quality of local journals (ref.: Rodrigues Coura J, Willcox, LdeCB. Impact factor, scientific production and quality of Brazilian Medical Journals).
 28. Report of the Commissioner of Health of Porto Rico for the fiscal year ending 1925 to the Governor of Porto Rico; San Juan, PR; Bureau of Supplies, Printing, and Transportation, 1926:9. See also: Pérez MA. One year old. Porto Rico Health Rev 1926; II:6-7: "The main object of the Review is to keep the medical class, the health workers and the interested public of both the United States and Porto Rico informed as to the public health work being carried on in the Island, and we think that, to some extent, this aim is being attained" (p. 6).
 29. Editorial. Porto Rico Rev Public Health Trop Med 1927; III:5. The complete statement was: "From the beginning of the present fiscal year this new publication is being issued every month as the official organ of the Department of Health. Besides the scientific articles which appear from time to time by the members of the editorial staff and those articles which deal with the Public Health problems of Porto Rico, the work of the Department of Health is fully discussed and analyzed and all the statistical reports from the different bureaus are summarized and included in each

- month's issue. Contributions from persons who are competent to discuss public-health problems are admitted for publication. Exchange relations have been established with a large number of publications of similar nature in the United States and abroad" (p. 5).
30. On the objectives of the original bulletin: a) In 1937, under a new Secretary of Health, Eduardo Garrido Morales, a new monthly Bulletin of the Department of Health emerged proving that the need for an official and popular sanitary bulletin "remained," as anticipated. b) Thus, this journal story shows the decisive historical support that the STM received from the HD, manifested in the eventual rendering of its Review and the construction of a district hospital for the School. These connections are evidence that the organic bond between the STM and the HD were present as early as the STM foundation itself, making the institutional historical scholarly concepts of public health and tropical medicine of the STM substantial with more ample public sanitary goals. However, there were also significant and revealing tensions and conflicts in this relationship.
 31. McKinley EB. School of Tropical Medicine of the University of Porto Rico under the auspices of Columbia University. Review of Research during the third year (1928-1929). *Porto Rico J Public Health Trop Med* 1930; 5:312-324. The complete statement was: "One of the outstanding events of the past year has been the beginning of our new Journal of Public Health and Tropical Medicine which is published quarterly in September, December, March and June of each year by the Department of Health of Porto Rico and the School of Tropical Medicine. The first number of the new Journal appeared in September 1929, as No. 1 of Volume V (taking the place of the former Porto Rico Review of Public Health and Tropical Medicine). In order to facilitate the publication of the new Journal its headquarters have been moved to the School of Tropical Medicine from its former office in the Health Department. Henceforth the Porto Rico Journal of Public Health and Tropical Medicine will serve as the principal medium for publications from the School" (pp. 312-313).
 32. "Obituary of Earl B. McKinley, MD." *P R J Public Health Trop Med* 1938; 14:93. In the Obituary of Earl B. McKinley, these words of gratitude were included: "...called to the School of Tropical Medicine in 1928 to reorganize the Department of Bacteriology, he was elected Director a year later... through his interest, the publication issued by the Board of Health and the School of Tropical Medicine grew from a tiny review into a sizable scientific journal."
 33. Mayo Santana R. La revista científica como fuente histórica primaria. The journal was free of charge during the monthly HD-Bulletin stage (1925-27). Since the change to an STM's administration and to quarterly numbers, each issue was priced and its cost increased gradually: \$2.00 (Vols. III-VI, change of stage); \$3.00 (Vols. III-VI, new Commissioner); and \$4.00 (Vols. XIV-XXII, published by Columbia).
 34. Mayo Santana R. La revista científica como fuente histórica primaria. The size varied with time, increasing when it first passed to the STM (Vol. V, from $5\frac{3}{4} \times 8\frac{3}{4}$ to $7\frac{1}{2} \times 10\frac{1}{2}$), and reducing slightly later until it reached a stable form ($6\frac{1}{2} \times 9\frac{1}{2}$).
 35. García GL. I am the other: Puerto Rico in the eyes of North Americans, 1898. *J Am Hist* 2000; 87:39-64. The U.S. Senate approved a joint resolution in 1930 which restored the proper name of the Island; thus, amending the 'arbitrary and unjustified' (Antonio S. Pedreira, UPR Professor, Humanist, 1928) 'mutilation of a native name' (E.W. Hilgard, University of California Professor, Geologist, 1900).
 36. As hypothesized early in this historical series distinct neocolonial institutional aspects, within a colonial political context, varied in intensity at crucial or defining moments. On Pan-Americanism, at the time, see: Fernos R. Science Still Born: The Rise and Impact of the Pan American Scientific Congresses, 1898-1916; Lincoln, NE; iUniverse, 2003. Godshall LW. Pan-Americanism. *Social Science* 1929-1930; 5:25-29. Lockey JB. Pan-Americanism and imperialism. *Ame J International Law* 1938; 32:233-243. Lockey JB. The meaning of Pan-Americanism. *Ame J International Law* 1925; 19:104-117. Padilla E. The meaning of Pan-Americanism. *Foreign Affairs* 1954; 32:270-281.
 37. On permanent sections, see: Reviews of Reviews (of the medical literature), by José Rodríguez Pastor (Chief Tuberculosis Bureau) (#18 items); Abstracts from the Rockefeller Foundation, edited by the Foundation's president, George E. Vincent (Vol. II, Nos. 1-3, 12; #4); News or Brief News Notes (#19), eight signed by Irvine-Rivera (until Vol. 2, No. 8); Reports by directors of HD Divisions or other public health institutions (#21); Sanitary Rules and Regulations (ended in Vol. II; #19) (e.g., vaccination, food and drugs, theaters, manufacturing buildings, drinking vessels, embalmers, slaughters houses, corpses and cemeteries, garbage and refuse); and Statistical Reports (#21) (e.g., Bureau Reports, Causes of Death, Vital Statistics).
 38. On the process of elimination of sections, see details: a) the first to go was the Sanitary Rules and Regulations in 1927 (Vol. II, No. 11); b) the HD-Reports ended as a section with the incorporation of the STM in 1927 (Vol. III); c) the Review of Reviews changed first to Book Reviews and were phased out in 1931 (Vol. 7, No. 3); d) the Brief News Notes changed into News Items in 1929 (Vol. 5), and toward banishment in 1931 (Vol. 7, No. 1); e) the Rockefeller Foundation abstracts ended in 1928-29 (Vol. 4), to reappear as Abstracts of Current Literature in 1930 (Vol. 5, No. 4), and to finally end in 1932 (Vol. 7, No. 4); and f) the most durable section was the Statistical Reports that survived until 1933 (Vol. 9, No. 1), one year after the change to a bilingual format.
 39. On the process of transformation from a sanitary bulletin to a scientific journal, see details based on a sample of the origin of authors by institution in several volumes: from Vol. I (1925-26), where almost all came from the HD (#38) (#3 other); to Vol. III (1927-28), with a majority already coming from the STM and Columbia (visiting professors) (#18 STM / #3 Columbia / #13 HD / #2 other); to Vol. VII (1931-32), in which very few came from the HD (#14 STM / #1 Columbia / #3 HD / #4 other); to Vol. VIII (1932-33), with the majority from the STM but with a significant increase from other local and international institutions (#9 STM / #1 Columbia / #2 HD / #5 other); and to Vol. XVIII-XIX (1942-44), with none from the HD or Columbia (#13 STM / #5 other), but still we find one Columbia author in each Vols. XX (1944-45) and XXII (1946-47, the last one) and one HD author in Vol. XX (1944-45) and in the last Vol. XXVI (1950). The decrease in articles from visiting professors from Columbia is evident since none appeared in Vols. XIV (1938-39) to XIV (1943-44)-World War II years (1939-45; the U.S. entered the war at the end of 1941).
 40. This list of institutions provides an expanded picture of authorship participation in the STM-Journal by writers from other institutions: a) other UPR campuses (e.g., see next reference; Río Piedras: Departments of Biology, Chemistry, and Social Work, and College of Pharmacy; and Mayagüez and Río Piedras Agricultural Stations); b) local institutions (Presbyterian Hospital, Blood Bank of Civil Defense at STM, P.R. Medical Association, Fajardo District Hospital, P.R. Public Health Association, Planning Board); c) federal institutions in P.R. (U.S. Department of Agriculture, Weather Bureau, Rockefeller Foundation, U.S. Army and Navy Medical Corps and Naval Reserve, U.S. Public Health Service, P.R. Reconstruction Administration Health and Rural Rehabilitation Divisions); d) U.S. health (NIH, Virgin Islands St. Croix, Gorgas Hospital on the Canal Zone, Pan American Sanitary Bureau in Washington D.C., National Committee on Maternal Health in New York City, Institute of Inter-American Affairs in Washington D.C., American Public Health Association), scientific (National Board of Standards, Laboratorio de la Casa Lederle in New Jersey), and academic institutions (universities: Howard, Tulane, George Washington, Pennsylvania, Duke, Rochester, Western Reserve, Minnesota, Johns Hopkins, Chicago, New York, Harvard, Michigan State College); and, e) finally, international institutions (e.g., Firestone Plantations in Liberia, Facultad Médica of El Salvador, Tanta in Egypt, Hospital San Juan de Dios in San José Costa Rica, Korea, Kiev Institute of Medicine, Universidad de Barcelona, Universidad Central de Madrid, Jewish Hospital of Alexandria in Egypt, Institute of Hygiene of Montevideo in Uruguay, Institute of Public Health and Tropical Diseases and Tiphus Fever Laboratory of the General Hospital in México City, St. Antoine Hospital in Paris, Institute of National Hygiene in Ecuador, Universidad de Bahía in Brazil, Universidad de Recife in Brazil, Oswaldo Cruz Institute in Río de Janeiro Brazil, Instituto de Parasitología de Buenos Aires in Argentina, Hospital San Antonio San Pedro de Macoris in the Dominican Republic, British Guiana Yellow Fever Service, Institute of Veterinary Investigations in Caracas Venezuela).

41. Articles from UPR professors from other campuses, as main authors: Biology Department (Rafael A. Toro Vol. VIII, No. 4, and Irving Fox, Vol. XVII, No. 4 and Vol. XX, No. 1), Chemistry Department (Joseph H. Axtmayer, Vol. VI, No. 2), Pharmacy College (Luis Torres Díaz, Vol. XI, No. 4), and Social Work Department (María Pintado Rahn, Vol. XIX, No. 1). Two of these professors (Chemistry and Biology), were transferred eventually to the STM—earlier, chemist Joseph H. Axtmayer to the Chemistry department and, much later, biologist Irving Fox to Medical Zoology.
42. During the first year of the Review (Vol. I), HD personnel sole authorship predominated, one by Sarah Lane, Superintendent of Nursing Services, on HD educational activities (No. 3:5-9); and three by Edith M. Irvine-Rivera, Managing Editor of the bulletin, on charitable institutions (No. 10:8-12), school physical education (No. 11:10-13), and school personal hygiene campaign (No. 12:8-11). Irvine-Rivera also was in charge of the Brief News Notes section during the first two years (until Vol. II, No. 8), and of the STM notes. There was one article in volume II by Martha Eliot (Yale University) on a study of rickets in children in P.R., and one by Irvine-Rivera on the STM. The first two published research studies (Vol. III, Nos. 7, 12) by a senior male author and a female assistant were from the Chemistry Department of the STM, by Donald H. Cook (PhD, 1923, Columbia) and Trina Rivera (BA, 1927, Columbia); the first one on vitamins (A, B, C and D) and the second on the diet in three insular institutions.
43. The participation of female authors (main or secondary) by stages was: First Stage (HD-Bulletin) 6 writers (3 per volume), all main HD authors; Second Stage (STM-integration) 7 writers (3.5 per volume), 4 main and 2 secondary STM authors; Third Stage (Science, quarterly) 7 writers (2 per volume) all STM writers (one visiting professor from Columbia), mostly main authors (5); Fourth Stage (Bilingual, STM locale) 9 writers (less than 1 per volume) mainly secondary authors (7), four from the P.R.R.A, but the two main authors are from the STM; and Fifth Stage (STM editorship) 35 writers (4 per volume), 37% main authors and 74% from the STM. Female authorship frequency decreased after the journal became a scientific one (1929-32) and decreased further when it became bilingual, but all authors were associated with the STM (initially, mainly secondary, and, later, mostly first authors). After the change of editorship (STM-Puerto Rican Director as first editor), there was a rebound which reached the highest average of 4 female writers per number (1943-50). In the last fifth stage, the percentages of female writers increased from a range of 4-11% (1942-45) to 15-22% (1946-49), and then diminished in the last two volumes to 6-7% (1949-50). The most prolific female writers by stages were: First Stage: HD employee Edith M. Irvine-Rivera on news, charities, and health education. Second and Third Stages: Trina Rivera, Assistant of Chemistry (vitamins, mineral metabolism, nutrition), and Alice M. Burke, STM Clinical Pathologist, on neoplasm, schistosomiasis, and tuberculosis. Fourth Stage: STM chemist Luz M. Dalmau on mycology and nutrition, and Rafaela Espino, from the P.R.R.A., on Health and Socio-economic Studies in P.R. Fifth Stage: the most prolific female STM researcher with 8 papers, Caroline Kreiss Pratt, from the Clinical Medicine Department (mainly schistosomiasis; sprue, filariasis), and Josefina Acosta Matienzo, Medical Zoology Department, on schistosomiasis and intestinal protozoan.
44. The main authors with most publications from the HD-personnel were, first, the Rockefeller Foundation medical malariologist Walter C. Earle with 14 articles, particularly a series of 15 papers on the "Studies on the malaria problem in P.R." (with H.A. Johnson and E. Garrido Morales as coauthors) (vols. I-III); and, second, the Director of the HD-Biological Laboratory, Pablo Morales Otero, a doctor in medicine specialized on bacteriology and a future professor and Director of the STM, with 8 diverse articles (e.g., Biological Laboratory HD-reports, milk supply, Wasserman-Reaction test).
45. During the second and third stages (1927-32, vols. III-VII), the most productive writers were from the STM: 1) bacteriologist Pablo Morales Otero with 11 articles (e.g., Brucella, experimental infections, leprosy, plague in PR, throats infections, Wasserman-Reaction); 2) parasitologist William A. Hoffman with 10 papers (e.g., dog tapeworm, filariasis, intestinal parasites, schistosomiasis); and 3) tropical medicine and mycologist Bailey K. Ashford, also with 10 articles (e.g., blood pressure, mycology, pernicious anemia, sprue). The fourth stage (1933-42, vols. VIII-XVII) shows three STM researchers with more publications: 1) Pablo Morales Otero with 12 papers (e.g., brucellosis, Health and Socio-economic Studies in P.R., lymphangitis, plague review, rural sanitation, tuberculosis); 2) dermatologist Arturo L. Carrión has 9 articles (e.g., actinomycosis, chromoblastomycosis, dermatomycosis); and 3) medical parasitologist Rafael Rodríguez Molina also with 9 articles (e.g., experimental studies with hogs, intestinal infections, macrocytic anemia, malaria, sprue, uncinariasis). Finally, in the last stage (1942-50), writers with most articles were all from the STM: 1) tropical medicine and medical supervisor F. Hernández Morales with 25 highly diverse publications (particularly schistosomiasis with 11); 2) parasitologist José F. Maldonado with 9 papers (filariasis, but mainly schistosomiasis); and 3) parasitologist José Oliver González has 8 papers (e.g., Trichinella, but mostly schistosomiasis).
46. Throughout the Journal's lifetime (distribution of articles were grouped in 4 periods of stages: first, second & third, fourth, and fifth) the most prolific authors were: 1) HD/STM medical bacteriologist Pablo Morales Otero (distribution: 7, 12, 11, 1 = 31); 2) STM tropical medicine and clinical supervisor F. Hernández Morales (0, 0, 4, 25 = 29); 3) HD/STM medical malariologist Walter C. Earle (14, 2, 4, 0 = 20); and 4) HD/STM clinical pathologist Oscar Costa Mandry (0, 8, 5, 3 = 16) and parasitologist William A. Hoffman (0, 10, 6, 0 = 16).
47. With respect to articles of some prominent diseases, the findings were: a) plague (n=2), was of either historical interest or just mentioned in a HD rat-flea survey; b) yellow fever (n=3), were all non-local population papers; and c) yaws (n=4), which was the subject of two non-local papers, one HD-control bureau report, and one theoretical publication.
48. The content of basic scientific publications, as the third significant analytical theme in the lifetime of the Journal, was the most difficult due to its interrelationships and convergences with the other major categories (i.e., diseases and public health). However, the consideration of the nature of basic science publications is transcendental to the main goal of understanding the history of science at the STM. The following criteria of type of articles facilitated the characterization of a paper as being of a more basic scientific research nature: general scientific disciplines (e.g., zoology, botany, biology), basic biomedical sciences (e.g., parasitology, bacteriology, mycology, biochemistry), experimental animal studies, normal medical biological parameters or states, and scientific editorials. Finally, the decision was made by the author to include veterinary and laboratory medicine in the general basic science category, as allied basic sciences, because of their particular area of impact.
49. On malaria, see: a) Rigau-Pérez JG. The apogee of tropical medicine. In: Mayo Santana R, Ramírez de Arellano AB, Rigau-Pérez JG (eds.). *A Sojourn in Tropical Medicine: Francis W. O'Connor's Diary of a Porto Rican Trip, 1927*; San Juan, PR; La Editorial, Universidad de Puerto Rico, 2008: 161-165: Malaria was the third cause of death in 1927, after pulmonary infections and diarrhea and enteritis; and b) Statistics Reports, P R J Public Health Trop Med 1932; VIII:83-90: Table I. Death from Transmissible Diseases, 1931 & 1932, January, February, March, malaria was the second cause of death after tuberculosis (p. 86); "The death rate from malaria in 1931 has been the highest ever registered in the history of Puerto Rico..." (p.88). On schistosomiasis, see: Hillyer GV. The rise and fall of bilharzia in Puerto Rico: Its centennial 1904-2004. *P R Health Sci J* 2005; 24:225-235.