

# **Food for Every Mouth: Nutrition, Agriculture, and Public Health in Puerto Rico, 1926-1966**

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Before I begin, I want to affirm that the title of this research report will also be the title of my dissertation.

During the aftermath of the Great Depression, images of poverty and disease characterized descriptions of life in Puerto Rico. The island was particularly infamous for its malnutrition situation, especially among children. Public health experts associated this problem with the deficiencies of the island's traditional diet, ignorance of "basic" nutrition principles, and the difficult economic situation. The Rockefeller Foundation (RF) had an important role in the creation of knowledge about the public health and nutrition situation in Puerto Rico by sponsoring various research programs at the Puerto Rico School of Tropical Medicine (STM). The RF also played an important part in the implementations of public health interventions and its representatives on the island contributed to debates about the nature and magnitude of Puerto Rico's malnutrition problem.

As part of my dissertation research, which examines nutrition sciences, politics and politics in mid-twentieth century Puerto Rico, I investigated the RF's involvement in the organization of nutrition research projects and child feeding programs during this crucial period in the island's history. Through a study of related archival documentation, I aimed to analyze how the RF's institutional, scientific, and public health discourses informed the ways in which

malnutrition was conceived in Puerto Rico. To accomplish this, I focused on the documentation related to the RF's sponsorship of a series of nutrition studies at the STM from 1931 to 1935, as well as on the foundation's collaboration with other nutrition initiatives on the island. These activities and interventions were crucial for the construction of a particular set of ideas regarding the nature of malnutrition in Puerto Rico. Also, these ideas interacted with emerging political discourses that challenged, in various degrees, the United States' colonial administration and economic organization of the island.

The RF began its involvement in the affairs of Puerto Rico's health and medical care in the early 1920s. During these years, the island's economy was dominated by sugar cane cultivation and characterized by sharecropping and absentee landownership. In this context, poverty and disease coexisted and reinforced each other. Malaria and intestinal parasitism were especially prevalent in rural areas. Tuberculosis, while also prevalent in the countryside, was "literally epidemic" in urban centers, with a death rate over three hundred people per 100,000 population.<sup>1</sup> In these circumstances, the Commissioner of Health and the Governor requested assistance from the RF. The Commissioner presented Puerto Rico's dire situation to the RF, noting how the island "is victim of three nosological species of the greatest transmissibility: tuberculosis, malaria, and uncinariasis, with the three of them demanding equal attention, solicitude and larger resources."<sup>2</sup> In 1920, the International Health Board of the RF (IHB) officially inaugurated its mission on the island. Although during these early years it focused mostly on hookworm and malaria campaigns, the RF also collaborated with the Insular Department of Health in the organization of a system of dispensaries and municipal public health units, which offered child health conferences, prenatal and maternity clinics, dietetics demonstrations, and treatment for tuberculosis patients.<sup>3</sup>

During the late 1920s, the activities of the RF and the Insular Department of Health began to be complemented by the research and teaching conducted at the STM. Inaugurated in 1926 as a branch of Columbia University's College of Physicians and Surgeons, the STM was the first institution for medical and scientific training on the island giving local physicians, researchers, and public health officials an opportunity to have first-hand experience with tropical medicine research.<sup>4</sup> The School also organized a Department of Chemistry staffed by biochemists and clinical nutritionists. The Department's work started in the midst of a "revolution" in nutrition sciences that occurred after the recent "discovery" and isolation of vitamins which led to the gradual understanding of malnutrition as a chronic condition characterized by persistent deficiencies.<sup>5</sup>

Donald Cook, Joseph Axtmayer, and Trinita Rivera were among the researchers at the STM working in nutrition research. Cook was a Columbia University graduate and former student of renowned biochemist Henry Sherman.<sup>6</sup> Axtmayer, who had an appointment at the Department of Chemistry of the University of Puerto Rico was also Sherman's student and co-directed with Cook of the STM's nutritional research program. Since 1928 they were actively involved in studies of the nutritional qualities and composition of the typical Puerto Rican diet, particularly the polished rice and red kidney beans dish. They also wrote about the food problems of an island "nutritionally dependent on her imports."<sup>7</sup> Although Rivera's important role in these initial investigations is not apparent from these publications, she was responsible for a considerable portion of the technical work and was a central figure in future nutrition research and teaching at the STM.

The main conclusions of these studies associated the island's disease problems and malnutrition with Puerto Ricans' monotonous diet composed mainly of polished rice, red kidney

beans, and starchy tubers. From these preliminary-results, Cook and associates also concluded that the nutritional qualities of this diet failed to meet the basic requirements “for growth and the rearing of the young,” especially in relation to vitamins and proteins. Based on these findings, public health specialists in Puerto Rico emphasized how this widespread malnutrition situation increased people’s vulnerability to prevalent diseases such as diarrhea and enteritis, tuberculosis, and malaria.

These initial investigations of Puerto Rico’s diet were part of an emerging field of study called “tropical nutrition.” Bringing together ideas from tropical medicine and the new nutrition sciences, it focused generally on the study of deficiency diseases, such as beriberi and nutritional anemia, associated with the particular dietaries of tropical regions. In the case of Puerto Rico, the population’s reliance on polished rice as a staple was associated with the high prevalence of anemia and protein deficiencies. According to the Columbia faculty, the STM was ideally situated to contribute knowledge to this emerging field. Thus, Donald Cook, Henry Sherman, and E.B. McKinley (director of the STM) submitted to the RF a proposal “for a project to study the nutritional conditions in Porto Rico.”<sup>8</sup> In their view, these studies’ had the potential to both expand knowledge in tropical nutrition, as well as offer solutions to Puerto Rico’s main public health problems.

Several RF officials shared this view. For example, in his letter to William Darrach, Dean of Columbia’s College of Physicians and Surgeons, Frederick Russell noted that

“individually and collectively we feel very strongly that such a study [Tropical Nutrition Studies] should, if possible, be undertaken in Porto Rico. After several visits, I am convinced that the future health of the Island depends to a very large degree on the control of malaria, hookworm and tuberculosis. Therefore, perhaps the most important contribution which could be made toward solving those problems would be in attempting to improve the underlying malnutrition both for adults and children.”<sup>9</sup>

After reviewing this proposal and negotiating its terms, in November of 1930—the RF’s Division of Medical Sciences recommended a grant to Columbia University for a study entitled “Nutritional Studies of the Foodstuffs used in the Porto Rican Dietary.”

Cook and Axtmayer were responsible for conducting the studies with the collaboration of Rivera and other research staff at the STM. Sherman was instrumental in the negotiations that led to the award and offered advice in the analysis of biochemical data and the publication of results. In the initial plan, Cook and Sherman proposed to divide these studies in two parts: biochemical investigations of the vitamin and mineral content of native foodstuffs and field investigations of people’s diets. However, this last part was not considered feasible by officers in the Division of Medical Sciences given that, “they seem to be more sociological than chemical,” and could be carried out “as well or better by people who have had sociological training.”<sup>10</sup>

The biochemical investigations produced a considerable amount of data regarding the nutritive content of the foodstuffs most widely consumed by Puerto Ricans.<sup>11</sup> In the yearly report sent to the RF detailing the activities conducted under the grant, Cook described the results of studies performed from 1931 to 1934. The discovery of the high vitamin A content of annatto seed, typically used in the Puerto Rican diet as food seasoning and colorant, was one of the most emphasized and discussed results. This finding occurred as part of studies measuring the vitamin A, B, and D content in various fruits and vegetables native to the island. In the first year’s report, Cook noted that “besides the scientific interest in finding a seed so high in vitamin A, its universal use in the flavoring and coloring of rice, soups, meats and gravies may be of some significance nutritionally.”<sup>12</sup> Reports for the second and third years also emphasized the importance of this finding. During these years, the vitamin A investigations were extended to

include foodstuffs such as boiled green plantains, squash [calabaza], *mamey*, mango, and *garbanzos* [chick peas], avocado, guava paste, and ripe coconut meat.

Another part of the work conducted under the RF grant aimed to ascertain the nutritional value of Puerto Rico's typical dish, or the quantity and quality of nutrients provided by the most popular food combinations on the island, compared to other diets. These studies were conducted in lieu of more comprehensive nutritional field investigations. During the first year of work, Cook and Rivera undertook "a preliminary study of the efficacy of the native legume, *gandules* [pigeon peas], in hemoglobin formation in experimental animals suffering from nutritional anemia."<sup>13</sup> During the second year, this study was extended to include a more systematic investigation of the typical Puerto Rican dietary and food habits. According to Cook, "in trying to determine the relative state of nutrition of a people, we lack definitive comparative data." Moreover, "with certain food habits established in a country and through the workings of certain economic conditions, one cannot change the dietary to any great extent ... nor would it be wise to do so [until] till [it] is sure in what respects the dietary is deficient."<sup>14</sup>

Therefore, "in order to have a basis of comparison," Cook selected his own "continental diet," "a diet which was not chosen from any economic considerations and which was believed to be adequate in most respects, since it had maintained an individual in good health for six years," and weighed and measured his own food intake for a period of nine weeks. This analysis, Cook noted was in itself "an interesting study yielding data on calorie intake, vitamin A, and mineral content of the diet of a continental in the tropics." However, in order to make the study of more value to further their knowledge of conditions in Puerto Rico, "it was necessary to test a [Puerto Rican] Puertorrican diet under similar conditions for comparison." Cook obtained this diet from "one of the numerous little cafés in San Juan and its suburbs that cater to families by

sending out meals.” At that time, in 1933, the analytical data was not yet finished “but we can state that the vitamin A content [of the caterer’s diet] is about [one fourth] ¼ of that of the writer’s diet.”<sup>15</sup>

Together with the “continental diet” and the “urban diet” (purchased in San Juan) Cook and colleagues studied the *jibaro* or country diet composed of the food consumed by poor rural families.<sup>16</sup> The price of each meal was eighty-five cents for the continental diet, fifteen cents for the caterer’s, and eight cents for the *jibaro*’s.<sup>17</sup> The components of the diet of the *jibaro* they analyzed included “his range of food stuffs: polished rice, red kidney beans, pork, onion, chick peas, salted cod fish, olive oil, annatto seeds, lard, salt, garlic, black pepper, sweet potatoes, tomatoes, and pigeon peas.” Although they were surprised to find the highest iron content in this diet, they concluded that it was conspicuously low in vitamin A, calcium, and “good quality proteins.”<sup>18</sup> The RF grant officially ended in 1935, but articles based on these studies continued to be published during the following years.

Finding strategies to increase vitamin A and calcium intake were an important part of the nutritional research carried out at the STM. Given that what was considered the typical Puerto Rican diet provided low amounts of these nutrients, researchers emphasized the need to increase the consumption of protective foods like milk, eggs, fruits, and vegetables, especially among children. Therefore, another part of my project examines the organization and functioning of child nutrition programs, such as milk stations, and the role of the RF in their implementation. Apart from hookworm, malaria and tuberculosis, the infant mortality rate was another worrisome indicator of the poor health of the island’s population. For 1926-1927, this rate island-wide was of one hundred sixty-seven per each thousand live births.<sup>19</sup> Diarrhea and enteritis were the primary cause of infant mortality throughout the island. Antonio Fernós Isern and José

Rodríguez Pastor, officials at the Department of Health, pointed to poverty and maternal ignorance of proper infant feeding as the most important factors accounting for the observed mortality in children from zero to six months. The practice of weaning infants too early and giving them ‘herbal teas’ and other ‘artificial foods’ made from solids like rice with bean gravy, was in their view, responsible for the high prevalence of gastrointestinal disorders and malnutrition, especially after six months of age.<sup>20</sup>

Related to the problem of improper feeding and malnutrition, the limited consumption of cow’s milk became a topic of increasing importance for specialists in maternal and child welfare in Puerto Rico. The potential for bacterial contamination of milk, recognized as a serious public health problem since the late nineteenth century, was especially associated with infant mortality in Europe and North America and led to the establishment of the first milk stations in France and the United States.<sup>21</sup> However, different from the U.S. and France, contaminated or adulterated milk was not a significant contributor to infant mortality on the island because this product was scarce and not affordable for most of the population. In Puerto Rico, the milk problem and its relationship to infant mortality was presented as an issue of quantity not quality. According to Fernós Isern and Rodríguez Pastor, “the prohibitive cost of milk is of greater importance, as far as it concerns the etiology of infant mortality in Porto Rico after the first six months of age.”<sup>22</sup> In this context, the provision of milk for children on the island “took a rank as a public health measure along with the hospitalization of open cases of tuberculosis, the field work against hookworm and malaria, and the laboratory studies of intestinal diseases.”<sup>23</sup>

Experiments among school age children were crucial for establishing the image of cow’s milk as a nutritious and growth-promoting beverage during the late 1920s. For example, in 1928 John Boyd Orr published in Britain, the results of studies investigating the value of whole cow’s

milk as a growth promoting factor.<sup>24</sup> Orr found that “there was a clear correlation between an added milk diet and extra growth in children” and that the “increase in the height and weight of children who received an added milk diet was twenty percent greater than that of children who received no extra milk.”<sup>25</sup>

George Payne, an RF official who supervised the functioning of the municipal health units of the Department of Health, and unit physician Ezequiel Martínez, conducted a similar study among Puerto Rican children assisting to two schools in Río Piedras.<sup>26</sup> Payne and Martínez’s study aimed to “search for some article of food which might be used in school lunches for the poorer classes to improve the [their] general health and to reduce the evidence of under-nutrition.”<sup>27</sup> For this, they compared the weights of children in two experimental groups, one receiving a supplement of whole milk powder and the other bananas. Their study showed that although all children experienced a net loss in weight “the group receiving milk showed a smaller net loss than the other groups.”<sup>28</sup>

On the basis of studies and observations like these, health authorities in Puerto Rico associated the problem of malnutrition among infants to a very low per capita consumption of milk, especially in rural areas where the death of children seemed to be an everyday occurrence at the time of Payne and Martínez’s experiment. This was one of the most vivid recollections Theodore Roosevelt, Jr. had of a survey tour he made after being appointed Governor in 1929. Roosevelt summarized his impressions of the island in various articles appearing in the U.S. press.<sup>29</sup> Among these, *The Literary Digest* published an account of Roosevelt’s observations under the title “Porto Rico’s Hungry Children.” “The basis of health is adequate food,” the new Governor wrote, “and this is what the children of Porto Rico have not had, and do not get to-

day.” With “hundreds of thousands on starvation diets the results are obvious; in their weak and depleted condition they go down before attacks of any serious disease.”<sup>30</sup>

These portrayals of the plight of Puerto Rico’s children led to a renewed interest in the many public health problems besieging the island which were exacerbated by a devastating hurricane in 1928 and by the Great Depression following it. This publicity compelled charitable foundations in the U.S. to pay attention to the living conditions of the children of Puerto Rico.<sup>31</sup> Among these, the American Child Health Association (ACHA) visited the island in January of 1930 to conduct a systematic inquiry “in respect to the health, nutrition and social relations of the people, especially the children, of Porto Rico.”<sup>32</sup> After the Association submitted its preliminary report, the American Relief Administration (ARA) made available a \$100,000 emergency fund to be immediately placed at the disposal of the Governor and the Commissioners of Health and Instruction. From these funds \$75,000 was allocated to the Department of Instruction for the purpose of feeding school and pre-school children and \$25,000 to the Department of Health.

However, RF officials on the island disagreed with this view of starvation and hunger as a problem in Puerto Rico and argued that the real issue was the underlying and chronic malnutrition most Puerto Ricans suffered. As Payne detailed in a letter to H.H. Howard, only \$1,000 of the \$25,000 allocated to the Department of Health was “to be used for medicines for babies who attend the clinics in the [public health] units” and “\$24,000 is to be used for the purchase of milk for infants of less than one year. This sum must be spent on milk alone.” According to the plan, this milk was to be distributed to infants and mothers at milk stations to be established throughout the island. Nonetheless, no funds were assigned “for the employment of additional personnel, transportation of the milk to various parts of the island, or for petty expenses involved in the operation of the milk station.”<sup>33</sup>

Payne was critical of this allocation of funds exclusively for the provision of milk. He believed that the problem in Puerto Rico was not necessarily related to caloric intake, but to the poor nutritional quality of people's diets. "I understand," Payne continued, "that it was represented to the American Relief Commission that an emergency existed here and that it was necessary to supply food immediately to save the lives of starving children." This was not the case Payne argued, noting also that the implementation of the feeding program as required, presented a problem for authorities on the island as they [the ARA] "insist that the [milk] distribution must extend to every municipality regardless of the existence of proper health organization for the best use of the material."<sup>34</sup>

Howard agreed with Payne that it was an erroneous belief "that there was an emergency in Porto Rico which had to be met immediately to save the lives of starving children."<sup>35</sup> In a memorandum to Russell summarizing the findings of the ACHA inquiry, Howard also highlighted the proposed tropical nutrition studies to be carried out at the STM "in which the I.H.D. may cooperate" and presented these as examples of more sound efforts to alleviate the island's chronic public health problems than "the employment of emergency measures" suggested by the ACHA.<sup>36</sup>

Another RF associate, Colonel E.B. Vedder, was of the same opinion as Payne and Howard after visiting Puerto Rico between January and February of 1930. His reaction with "regard to the question of nutrition" was "that there is no starvation in Porto Rico." "For many years," he noted, "the general population of Porto Rico—that is the working classes—have subsisted on a diet that is inadequate and lacks variety. Probably at no time within the last thirty years have the working classes had a suitable diet." Vedder considered that "a part of this is due to ignorance on their part as to what a proper diet would be," but he concluded that "more is due

to unfavorable economic conditions.” According to Howard, “Colonel Vedder sees no immediate remedy; he feels the whole economic system must be changed” as “the productive lands of Porto Rico are in the hands of corporations or wealthy individuals and consequently the average family of the working class does not even have a garden spot upon which to raise fruits and vegetables.” Moreover, “there is no local supply of vegetables and fruits at a reasonable price, there is but little milk consumed in the island and but little meat.”<sup>37</sup>

Even when Payne did not share the ARA and the American Child Health Association’s views and concurred with Vedder’s assessments of the problem of nutrition in Puerto Rico, he agreed to head the committee in charge of administering the milk fund. During the mid-1930s, he continued serving as the Director of Public Health Units of the Department of Health which administered the milk stations. These infant feeding services and milk stations, originally organized as emergency measures, became the basis of future child nutrition initiatives on the island.

These services also assumed a symbolic power in the political climate of the late 1930s and throughout the 1940s. The *Partido Popular Democrático* [Popular Democratic Party-PPD] emerged dominant from the turmoil of the 1930s with a social justice agenda based on reforms to the absentee landowning regime and the dominance of sugar corporations. The party’s slogan *pan, tierra y libertad* [bread, land and liberty] reflects the central role played by ideas about nutrition and feeding in the construction of its political project and ideological commitment to the poorer classes. For poor Puerto Ricans, the expansion of public health and nutritional services was part of the materialization of the PPD’s promise of social justice and this discourse shaped the ways in which they understood and made use of them.

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The ideas and opinions expressed in this report are those of the author and are not intended to represent the Rockefeller Archive Center.

## ENDNOTES:

<sup>1</sup> Editorial. "The Health of Porto Rican Children." *American Journal of Public Health* 21: 12 (1931), pp. 1362-1364.

<sup>2</sup> Ruiz-Soler to Vincent, October 6, 1919; Yagen to Vincent, October 8, 1919, Rockefeller Archive Center (RAC), Rockefeller Foundation Archives (RF), Record Group (RG) 1.1, Series 243, Box 3, Folder 42.

<sup>3</sup> A.L. Van Horn. "Puerto Rico and Child Health." *The Child* 4: 9 (1940), pp. 235-237.

<sup>4</sup> Annette Ramírez de Arellano. "The Politics of Medical Education in Puerto Rico." unpublished Ph.D. thesis, Columbia University, 1985; José Amador. "Redeeming the Tropics: Public Health and National Identity in Cuba, Puerto Rico, and Brazil," unpublished Ph.D. thesis, University of Michigan, 2008.

<sup>5</sup> Nick Cullather. "The Foreign Policy of the Calorie." *The American Historical Review* 112: 2 (2007), pp. 337-364; James Vernon. "The Ethics of Hunger and the Assembly of Society: The Techno-Politics of the School Meal in Modern Britain." *The American Historical Review* 110: 3 (2005), pp. 693-672.

<sup>6</sup> P. L. Day. "Henry Clapp Sherman, 1875-1955." *The Journal of Nutrition* 61: 1 (1957), pp. 1-11.

<sup>7</sup> Donald Cook. "Some Aspects of the Food Problem in Puerto Rico." *Porto Rico Review of Public Health and Tropical Medicine* 3: 2 (1927-1928), pp. 59-67; Joseph Axtmayer. "A Study of Vitamin B Complex of Red Kidney Beans and Polished Rice." *Journal of Nutrition* 2: 4 (1930), pp. 353-357; Donald Cook and Trinita Rivera. "Rice and Beans as an Adequate Diet." *The Porto Rico Journal of Public Health and Tropical Medicine* 5: 1 (1929-1930), pp. 16-20.

<sup>8</sup> H.T. Clarke to William Darrach, May 23, 1930. RAC, RF, RG 1.1, Series 200, Box 80, Folder 958.

<sup>9</sup> Darrach to Russell; May 28, 1930. RAC, RF, RG 1.1, Series 200, Box 80, Folder 958.

<sup>10</sup> Lambert to McKinley, September 18, 1930. RAC, RF, RG 1.1, Series 200, Box 80, Folder 958.

<sup>11</sup> Joseph Axtmayer and Donald Cook. "Nutrition Studies of Foodstuffs used in the Puerto Rican Dietary I: The Vitamin A Content of White and Yellow Yams." *American Journal of Tropical Medicine* 12 (1932), pp. 317-321; Joseph Axtmayer and Sylvia Silva. "Nutrition Studies of Food Stuffs used in the Puerto Rican Dietary III: The Vitamin G (B2) Content of Ripe Plantain (*Musa paradisiaca* L.) and Pigeon Pea (*Cajanus cajan* L.)." *The Puerto Rico Journal of Public Health and Tropical Medicine* 8: 1 (1932), pp. 1-4.

<sup>12</sup> D.H. Cook. "Report from the Department of Chemistry of the School of Tropical Medicine for the First Year's Work under the Nutrition Research Grant from the Rockefeller Foundation," 1932, p. 1-2. RAC, RF, RG 1.1, Series 200, Box 80, Folder 958.

<sup>13</sup> *Ibid*, p. 3.

<sup>14</sup> D.H. Cook. "Report from the Department of Chemistry of the School of Tropical Medicine for the Second Year's Work under the Nutrition Research Grant from the Rockefeller Foundation," 1933, p. 4. RAC, RF, RG 1.1, Series 200, Box 80, Folder 958.

<sup>15</sup> *Ibid*, p. 4-5.

<sup>16</sup> *Jibaro* is the name commonly given to the peasants of Puerto Rico's rural areas, particularly the mountainous interior.

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- <sup>17</sup> Donald Cook, Joseph Axtmayer, and Luz Dalmau. "Nutrition Studies of Foodstuffs used in the Puerto Rican Dietary VII: A Comparative Study of the Nutritive Value of Three Diets of Frequent use in Puerto Rico." *The Puerto Rico Journal of Public Health and Tropical Medicine* 16: 1 (1940), pp. 3-13.
- <sup>18</sup> Joseph Axtmayer. "Puerto Rico's Vicious Cycle: A Study of the Island's Diet." *Independent Journal of Columbia University* 4 (1937), p. 3.
- <sup>19</sup> Insular Department of Health. "Annual Report of the Dispensaries of Child Welfare, Maternity and Tuberculosis of the Health Department of Porto Rico, 1927-1928." *Porto Rico Review of Public Health and Tropical Medicine* 4: 6 (1928), pp. 256-268.
- <sup>20</sup> Antonio Fernós Isern and José Rodríguez Pastor. "A survey of Infant Mortality in Porto Rico." *The Porto Rico Journal of Public Health and Tropical Medicine* 6 (1930), pp. 151-193.
- <sup>21</sup> Constance A. Nathanson. *Disease Prevention as Social Change: The State, Society, and Public Health in the United States, France, Great Britain, and Canada*. New York: Russell Sage Foundation, 2009; Rima D. Apple. "Reaching Out to Mothers: Public Health and Child Welfare." London: European Association for the History of Medicine and Health Publications, 2002.
- <sup>22</sup> Fernós Isern and Rodríguez Pastor, "A Survey of Infant Mortality in Porto Rico," p. 175.
- <sup>23</sup> Editorial, "The Health of Porto Rican Children."
- <sup>24</sup> Francis McKee. "The Popularisation of Milk as a Beverage During the 1930s." In David F. Smith, editor, *Nutrition in Britain: Science, Scientists and Politics in the Twentieth Century*. London: Routledge, 1997, pp. 123-149.
- <sup>25</sup> *Ibid*, 126.
- <sup>26</sup> George Payne and Ezequiel Martínez Rivera. "An Experiment in Supplementing the Diet of School Children." *Porto Rico Review of Public Health and Tropical Medicine* 4: 6 (1930), pp. 247-252.
- <sup>27</sup> *Ibid*, 248.
- <sup>28</sup> *Ibid*, 251.
- <sup>29</sup> "Needy Porto Rico." *The New York Times*, December 11, 1929, p. 28; "Puerto Rico's Hungry Children." *The Literary Digest* 103 (1929), p. 11.
- <sup>30</sup> "Puerto Rico's Hungry Children."
- <sup>31</sup> *Ibid*.
- <sup>32</sup> Samuel Crumbine, Harold Mitchell, and Amy Pryor Tapping. *Porto Rico: An Inquiry into the Health, Nutritional, and Social Conditions in Porto Rico as They May Affect Children*. New York: American Child Health Association, 1931, p. 10.
- <sup>33</sup> Payne to Howard, February 18, 1930. RAC, RF, RG 1.1, Series 243, Box 1, Folder 18.
- <sup>34</sup> *Ibid*.
- <sup>35</sup> Howard to Payne, February 25, 1930. RAC, RF, RG 1.1, Series 243, Box 1, Folder 18.
- <sup>36</sup> Memorandum to Dr. Russell, March 28, 1930. RAC, RF, RG 1.1, Series 243, Box 1, Folder 18.
- <sup>37</sup> Memorandum by Dr. Howard in Re Colonel E.B. Vedder, February 2, 1930. RAC, RF, RG 1.1, Series 243, Box 1, Folder 11.