The West Indian Diet: Thomas Dancer, Breadfruit and Fever Epidemics in Eighteenth Century Jamaica

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Abstract

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This thesis argues that late-eighteenth-century British Caribbean doctors created a West Indian diet as the principal preventive measure against the local disease environment. The mortality rate was very high in this region because newcomers had little immunity against yellow fever and malaria. The three populations inhabiting the island, European settlers, enslaved Africans and British soldiers, were all heavily affected, a problematic situation for the empire because it augmented drastically the cost, in human and economic terms, of maintaining this important colony. Contemporary medicine was ineffective against these diseases, and although doctors did not abandon their remedies, they also turned to alternative cures, one of them being a better diet. We follow in particular the life of Thomas Dancer (1750–1811), a Jamaican doctor and botanist who oversaw the public botanical garden in the town of Bath. His work as a botanist was focused on bringing useful plants to the island, including breadfruit as a food for enslaved people. Breadfruit, Dancer and others believed, would have created a profound transformation in enslaved Africans' nutrition and their health. Its success could have also given Dancer more transplantation opportunities. But the subsequent refusal of the slaves to eat breadfruit and the failure to sustain interest in botany made these goals impossible. Instead, he had greater impact

through his book *The Medical Assistant* (1801), intended to help European islanders with little access to medical expertise. In it, he offered what he thought was the best example of a West Indian diet, which promised to adapt European bodies to the tropical environment by emphasizing the consumption of indigenous vegetables over meat. Situating his dietary recommendations in broader ideas about the body and the tropics current in the late eighteenth century, enables us to better understand the nutritional paradigm of the time in relation to medicine and environment.

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Introduction

On February 5, 1793, the ships *Providence* and *Assistant* berthed at Port Royal, Jamaica; within their hull rested hundreds of tropical plants, among which was the coveted breadfruit.[1] Under the command of Captain William Bligh, the two ships had set sail on April 1, 1791, to the Pacific islands of Otaheite and Ceylon, now Tahiti and Timor.[2] The mission was to take in stock thousands of specimens and seeds of more than thirty plants and then deliver them to the British West Indian colonies, a botanical voyage of an unprecedented scale for the British Empire. Its first stop was the island of St-Vincent, where it delivered nearly half of its total cargo;[3] afterwards, the two ships toured the island of Jamaica to deliver another important portion of its manifest to the public botanical garden at Bath, and then on to Port Henderson and Savanna-La-Mar; the rest of the cargo was intended for Kew gardens back in England.[4] After their reception on the docks, the breadfruit and the other useful plants were spread throughout the island to the plantations, much to the delight of plantation owners and managers who had championed the arrival of this supposedly miraculous eastern plant.

This endeavour, set forth by the President of the Royal Society Joseph Banks, was an answer to the pleas of the West Indian governments and planters who had wished to introduce the breadfruit as a new food staple to provide for their slaves, the fuel of the Caribbean economy. Although the planters had demanded the plant for more than a decade before its arrival, their demand had become much more insistent after 1788 because of the loss incurred by a slaves' famine.[5] This famine had been caused by the concurrence of the American Revolution, which had disrupted trade in the region and closed off the closest

commercial partner of the British West Indies, and a series of hurricanes which had devastated the island of Jamaica multiple times, leaving the heavily dependent colony on imported goods with reserves only sufficient for the colonists. The reputation of the breadfruit, a nourishing staple that required little care to produce and could also be turned into a paste to make bread, travelled all the way to the ears of the Jamaican planters, who were in dire need to find a suitable crop to feed their slaves.[6] Banks, who had seen and tasted breadfruit, knew that the plant had the potential to greatly benefit the West Indian colonies, and thus benefit the empire that much depended on the sugar islands for its economy.[7] Alas, for Banks and the West Indian planters, the breadfruit, as well as the rest of the other plants, did not supply Jamaica nor the other British Caribbean islands with hunger-ending crops, the reason simply being that the slaves did not like its strange appearance, and it ended up being fed to pigs until it was adopted after emancipation;[8] the other East Indies plants were not successfully developed because interest in them rapidly faded. But on February 5, 1793, the botanists of Jamaica did not know of this unfortunate outcome, it was a day ripe with opportunities to ameliorate the diet of the slaves of the island as well as diversifying the agricultural production of the colony, and the most hopeful of all those present was the physician and botanist at Bath gardens, Thomas Dancer.

Figure 1: Two mature breadfruits

Thomas Dancer, born in 1750 in Scotland, came to Jamaica in 1773 after receiving his M.D. in 1771, to practise medicine where it was much needed.[9] After obtaining a post of physician at the Bath mineral springs in 1781, he discovered the botanical garden and developed a passion for botany, which he thought could help bring many useful plants to help the Jamaican population. From there, he began a correspondence with Edward Long, an influential Jamaican plantation owner and historian, and with Samuel More, secretary of the Society of Arts, Science and Commerce, while also continuously adding plants to the garden as well as pursuing his own experiments on certain plants, like Jamaican

Cinnamon. This last effort led to his recognition by Joseph Banks and the House of Assembly of Jamaica, securing his inclusion into the soon-to-be-devised plan of introducing breadfruit into the West Indies.[10]

Like Banks, the Assembly, and the planters, Dancer had high hopes that breadfruit and the other useful plants would help palliate the problem of subsistence of the slaves, but also of the European colonists who also suffered from a poorly conceived diet based too much on meat that would spoil quickly under the Jamaican sun. The overall poor health state of the populations of the West Indies did not help them to survive in the disease environment of the West Indies. Yellow fever and malaria were so deadly that they impeded the natural growth of the Jamaican population, which had to be sustained instead by a massive influx of European migrants and African slaves, a costly manoeuvre for the empire. European medicine had no effective cure against these two diseases, which led doctors powerless at first.[11] His many years as a physician at Bath and in Kingston, as well as an earlier employment with the military expedition against Fort San Juan, led him to conclude that a deficient diet and lack of sanitation resulted in an increase of sickness. Sanitation could be dealt with by following a few simple rules, but the amelioration of the Jamaican diet was a more complex problem in an island whose agriculture was dominated by sugar plantations.

This thesis proposes to use Thomas Dancer's publications and correspondences as well as multiple books published by other West Indian doctors in this period to argue that they were attempting to create and recommend a local diet as the primary preventive measure against the disease environment of the Caribbean. This diet was attuned to the food available in the West Indies, the needs of the colonists and the nutritional and medical

paradigm of the time. Eighteenth-century medicine believed that climate was the principal factor that affected human health by creating humoral imbalance as well as noxious miasmas that carried illnesses. If European medicine could not cure the Jamaican population, at least doctors could try to prevent it by proposing a healthier diet that focused more on vegetables and less on meat, and more on indigenous products that enabled the body to adapt to the Caribbean environment. We focus on Dancer because his medical and botanical work enables us to explore the intersection between food, medicine and botany in the Caribbean environment. His work as a botanist was influenced by his work as a doctor, his search for new plants was singularly focused on finding useful plants for the empire which could diversify the agriculture of the island or to introduce new medical plants to provide possible new cures. The writings of the other doctors will help us contextualize and add to Dancer's own work. By discussing the reasoning behind a healthy diet in the unique environment of the West Indies, it will enable us to identify elements of a possible nutritional paradigm before the advent of modern nutritional science and to see how food science was shaped by the environment in which it evolved.

Three populations will be discussed: African slaves, European colonists and British soldiers. The health of the soldiers stationed in the Caribbean was the subject on which doctors wrote the most, because they died more from diseases than at the hands of their enemies. The army's health was paramount to defend England's most important colonies from France and Spain as well as to suppress any slave rebellion. Getting food to the military both on land and at sea came to be crucial in making sure regiments would be fit to fight on arrival. The high mortality rate of the slaves was another primary concern of these doctors, knowing that even if the very prosperous plantation economy could more

than absorb this continuous loss, they still felt the need to find a solution to this situation both for humane and economic reasons. Dancer's botanical projects were in direct response to the events of this decade, first in finding suitable crops for the slaves to secure their nutrition needs, and second to help diversify the agriculture of the island to make it less dependent on sugar production because the cane plantations had been heavily damaged during the storms. This effort to help feed the slaves is also part of the amelioration policy that the planters enacted after the rise of anti-slavery sentiment which threatened the Jamaican economy. Amelioration had thus been conceived to show that slavery was not the problem, it was rather the treatment of the slaves that resulted in violence and death. If better ways to take care of them could be established, then they would live long, prosperous lives. The colonists were the linchpin of the imperial effort, and their health was deeply tied to the health of the empire. Because of the high mortality rate, the Caribbean had acquired the reputation of a "European death zone," which did not encourage English citizens to establish themselves in this environment. Doctors had observed that if someone survived his initial contact with the West Indian environment and then was able to keep himself healthy for a certain period, then he would be able to survive for his entire life in the Caribbean, his body had adapted to his new environment.[12] The principal way in which this adaptation process would happen was through eating, the consumption of a proper West Indian diet based on indigenous staples would permit this biological transformation.

Dancer's ultimate failure to transform the Bath gardens into one of the principal centres of botanical science in the empire is an opportunity to see how the many forces necessary for such an enterprise interacted to lead to its demise instead of making it successful. Dancer's inability to successfully communicate with other botanists on a timely

basis led to the alienation of those who could have awarded him the most help, foremost being Joseph Banks. The lack of interest in the project, and thus the absence of resources given to it by the House of Assembly, did not allow Dancer to grow his operation, nor sustain it, and he had to practise in Kingston to provide for himself at certain times. The lack of result on Dancer's part, combined with the sugar boom that happened in Jamaica after the beginning of the Haitian revolution, led to a waning interest on the part of the House of Assembly for further botanical projects, thus a lack of funds. Thus, even if Dancer's botanical efforts were part of the scientific zeitgeist of the time and situated in the most important colony of the empire, they did not bring about the legacy that Dancer could have hoped for.

The thesis will be divided into two chapters centred around the work of Thomas Dancer and separated by the arrival of the *Providence* in 1793, since its cargo was meant to bring a total change in Jamaican food agriculture and thus validate all of Dancer's efforts prior to this date. The first chapter will present the nutritional and medical state of the three populations of Jamaica, as well as the medical paradigm of the time. We will also discuss how the American Revolution and a series of severe hurricanes in the Caribbean during this period impacted the island. The soldiers will be the first population addressed, and we will explain what doctors thought about their condition, why the Caribbean environment was deleterious to them and why an improved diet would help them. This chapter will conclude with the first years of Dancer's work at Bath until the arrival of the *Providence* and the *Assistant*, how he built his network and why he was included into this experiment. We will see the beginning of his thinking on how diet could help Jamaicans as well as his plans for how botany could be the solution. The second chapter will discuss the reasons

why Dancer's botanical project failed, starting with the hopes for and reception of breadfruit and other useful plants. We will continue with how the introduction of breadfruit in the provision grounds impacted the slaves, and how amelioration projects and the West Indian diet were connected. This chapter will conclude with a presentation of *The Medical Assistant, or Jamaica Guide of Physics,* Dancer's magnum opus, which summarizes nearly four decades of medical work in Jamaica, and compare the diet proposed in it with the diet of doctors from other West Indian colonies.

This thesis bases itself on a corpus of primary sources taken from private correspondence, official documents and books about medicine and life in the West Indies. The correspondence are primarily those of Thomas Dancer, with an addition from the correspondence of Joseph Banks with the gardeners on board Bligh's ships. The problem with correspondence is that it takes two to properly store the letters for safekeeping. In Dancer's case, his correspondents kept his letters, but on his part, he either did not keep a personal archive, or they were lost after his death, thus we do not know the contents of the letter he received. This can be circumvented by making deductions from Dancer's letters. Because Joseph Banks always made a copy of the letters he sent and properly stored those he received, we have an almost complete correspondence between him and Dancer or James Wiles, the gardener aboard the *Providence*. The information contained in these letters allows us to know what information and plant specimens were exchanged, and to witness the evolution of Dancer's botanical career.[13]

The journals of the House of Assembly of Jamaica represent the principal official documents used by this thesis, the two other one being a pamphlet written by Dancer addressed to the members of the House concerning the state of the public gardens and a

report delivered in 1788 about the casualties suffered from the multiple hurricanes. The volumes used range from 1791 to 1815, that is from the preparations for the arrival of Captain Bligh to shortly after Dancer's death. They consist of almost daily entries where the petitions and motions presented to or by the members are voted on, the discussions on them being mostly absent though. Thus, it offers an almost step by step view of the whole breadfruit project as seen from the colonial government, while offering a counterpoint to Dancer's own writing because they were often at opposing sentiments towards the state of botany in Jamaica. The pamphlet written by Dancer was critical of the way botany had been handled by the House of Assembly and offered a solution to this problem. But because this pamphlet intends to make a point, Dancer omitted certain facts or presented them under his own light. The report's objective was to prove that there was a food crisis in Jamaica that required the intervention of the colonial government to bring breadfruit to relieve the slaves' hunger. The mortality numbers were criticized both at the time of its publication and today as low due to flaws in the methods used to assess the situation and the conclusions taken from them.

The books presented in this thesis were mostly written by West Indian physicians, but some are accounts of life in Jamaica. Medical books concerned the three populations mentioned above, and that is the reason for this division. The information presented in those books are the causes, symptoms and remedies used against the principal tropical diseases such as yellow fever and malaria, but what is of interest to this thesis are the sections on nutrition. Their size is often no more than a dozen pages, but they are the only source about food science in the late eighteenth century. Because nutrition, health and climate were all linked in the late eighteenth century, these books allow us to understand

the paradigms in each discipline to further the critical analysis presented. We can also assess how doctors treated these three populations differently by how much care they took in writing about the secondary counsels like healthy lifestyle and the quantities given of each medicine. The lifestyle of the slaves is minimally discussed compared to the books on colonists and soldiers, only a few doctors discussed in length about the proper treatment that should be given to Africans. These books were intended to other doctors to discuss medical issues, but also to the authorities who could make policies based on their recommendations. Because of this, the language used is not approachable by the normal population, only Dancer's *Medical Assistant* which was clearly intended for this public uses a simpler language. The other books were written as accounts of life in the tropics, but they present only the lifestyle of the rich population. To write and publish required time and resources, only plantation owners and managers could afford to do this, thus they present only this viewpoint, excluding the poorer whites and the slaves from a larger presentation. Still, some describe the slaves' life on the plantation, sometimes with a certain critic of slavery, thus it allows us to better capture the nutritional life of the largest part of the Jamaica population.

This thesis intends to add to the field of food science and medical history, especially focusing on the social history of the Caribbean, health in the West Indies and colonial science in Jamaica just after the end of the American Revolution. The following period has been defined as the decline of the colonial West Indies.[14] The loss of their closest market negatively impacted the importations and exportations of the British colonies. Anti-slavery sentiment would gain in popularity in the years following until it would culminate in the ban of transatlantic slavery in 1809 and emancipation in Jamaica in 1838, stopping the

renewal of their workforce. Just as their means of production were being diminished, so would their revenues, not because Europeans boycotted sugar, but rather the price of this commodity would fall constantly throughout the 19th century as the Industrial Revolution would transform the global economy. The start of this decline has been a point of contention in the historiography. Historians have now pushed the beginning at least a decade later after the end of the American Revolution, and closer to the stopping of transatlantic slavery. By studying the revenues and level of exportations, it is evident that the American Revolution had a brutal impact on the West Indian economy, yet it did not last, and the British colonies recovered quickly. Instead, the decline would have started closer to the eighteenth century as the social and economical forces in England and Europe pushed planter society in a more difficult position.[15] The subject of this thesis is not about this decline, but it is argued that the will to transplant breadfruit, which was part of amelioration policies, was in response to these signs of decline. As the planters saw the opinion turn against slavery and the violent treatment it inflicted on enslaved Africans, breadfruit, combined with a better diet, would help alleviate these concerns and secure their workforce against any impediments on slave trade.

The historiography of Jamaica has been shaped by the division between masters and slaves, first by class and then by race. Social and economic historians have studied the history of the island through the opposition between masters and slaves. Studies have focused on the economic power and social state of either group within and without the island or have looked at their relationship through the domination brought upon by the slavery system.[16] Eventually, cultural and identity historians have broadened this division to transform it into a division between Europeans and Africans. By doing so, historians

gave themselves better analytical tools to fully understand the complexity of Jamaican life, which goes far beyond an economic opposition. From a group that had only been defined by plantation owners and managers, the situation of the whites was eventually expanded to include all the professions and roles they had on the island. Although every profession was related at some point to the plantation economy, this allowed to see how the different social and economic status came to influence Jamaican society and politics.[17] Doctors were such a group that had been overlooked, but were an important part of Jamaican life, healthcare being much needed in the tropical environment, their fortunes going up and down as conflicts erupted in the West Indies. The effect that slavery had on the African diaspora was of great interest. How slaves created their life and culture in this oppressive system and how they fought it gave much more agency to the demographically most important group on the island.[18] What interests us particularly with this new view is how historians have defined the relationship that each race had with food and health.

The economic situation of Europeans varied widely, which affected how they could sustain themselves. Most of them on the island were farmers who produced the staples that would feed both populations, but as many historians have shown, the intensive culture of sugar cane left very little arable land to feed the most populous West Indian British colony, thus they had to rely a lot on importation to have access to the food they could not grow. A point of disagreement within the food history community is the role that food importation had on completing the whites' diet. John Parry noted that importations were costly, only the rich planters could afford them, while the rest of the white population had to make do with what they had.[19] In *Sugar and Slaves* (2000), Richard Dunn stated that in general, Europeans disliked the local staples, it was too different from what they had in their home,

thus they were willing to pay a lot for imported flour, barley or salted meats.[20] This exhaustive work gives a very good view of what constituted the diet of both rich and poor whites. Food varied widely both in terms of quality and quantity between the poorest and richest Jamaican, but the elite still suffered from nutrition-related health issues because they ate and drank too much, with meat that was often in the early stages of putrefaction.

The Africans' diet was certainly simpler since they had relatively little choice in what food they could eat, but it is the source of these different elements that has interested historians. Roderick McDonald gave an extended look at all the vegetables and animals that were grown or raised by the slaves in their provision grounds, which he identifies, as well as many other historians, as the principal source of food for slaves, at least in Jamaica.[21] The slaves could then use what they had from this small land to go to the market to buy either food or items, creating a slave side economy. This enabled slaves to have a somewhat more diverse diet when they had surplus. Kenneth Kiple has given a more contrasted view than McDonald by noting that food sources changed depending on the island studied.[22] Jamaica was the largest island; thus, the planters could afford to give a significant portion of land to slave ownership, which had the benefit to make them less responsible for feeding them. On smaller islands like the Leeward Islands, planters had to take responsibility for it because there was no space for the provision grounds, the food grown by farmers and importations had to be shared with them. Hybridity between those systems were possible depending on the size of the island and the events surrounding the British West Indies.

The historiography of health in tropical environments in the colonial era is very rich. The medical paradigm of the time linked health to climate, and Europeans had a hard time

surviving in the hot and humid climate of these environments, it was the subject of a lot of discussion among late eighteenth-century doctors, authorities, scholars and others who wanted, and needed, to understand the power of the climate to provide better care for the colonists, and thus take care of the empire. Medical historians have described how European medicine evolved in tropical climates, who were the doctors who left their home and why they did so, and what their relationship was between them and their patients. In the West Indies, the doctor-slave dynamic as well as the health of the slaves is another component to consider, an entirely different problematic than the health of whites in the tropics because slavery was detrimental to health in the first place. Historians agree on certain elements like the presence of fake doctors which affected negatively the perception of doctors in the West Indies, as well as the impediment that plantation managers and owners made when it came to treat the slaves;[23] but other elements such as the influence that West Indian medical knowledge had in Europe and the changes in slaves' health as their treatment evolved are still being discussed.

Historians have identified multiple ill effects that slavery had on the slaves' health.[24] The violent and cruel treatment reserved to the slaves for punishment, or sometimes for the pleasure of the masters, is well-known. The extreme overworking of the slaves to produce industrial levels of production pushed their bodies to the limit, while the danger presented by the equipment such as the sugar mill could maim and kill them. Slaves were also chronically malnourished, historians have stated that in the best scenario, slaves' meals were still below what is required to feed a normal adult, let alone someone who worked as intensively as they did; at their worst, that is in times of crisis like wars, slaves would die of famine. This combination of factors left them more susceptible to yellow fever

and malaria, and it created other diseases like "dirt-eating." Doctors had a hard time treating them because they did not have the knowledge to fully understand the source of these diseases, but also because the masters cared little for their slaves. Although some masters did provide substantial care for their slaves, historians have demonstrated on multiple instances that the loss of time and cost of care seemed to be unacceptable to them even though they would have to buy new slaves, which was just as costly; it has been proposed that cruelty and racism prevailed to make the masters lose their perspective on the lives they had under their rule. Some of the biological effects of slavery are still being discovered.

In *The Reaper's Garden* (2008), Vincent Brown discusses that the world of death in which the slaves lived in had a profound psychological effect on them.[25] The state of depression in which they could fall left them even more prone to diseases, and they also refused to make children. Combined with the lack of healthcare and presence of deadly diseases, the slave population never grew, a principal element of the medical historiography of slave society in the West Indies. Historians have also identified the same problem of negative natality with whites in the West Indies, a very problematic element for colonizing empires. Although Europeans did not suffer from overworking or violence, they had even less immunity against yellow fever and malaria. These two diseases were the principal death factor in the late eighteenth century.[26]

Another important element that historians need to consider when studying the healthcare given to enslaved Africans in the eighteenth century is that it evolved in parallel with the development of the concept of race and racial difference within humanity. The historiography on this subject is abundant, tracing the roots of this idea to scientific pursuit of the Enlightenment in finding on explanation for the diversity of life on Earth, but also

from a desire of the colonial society to order humanity with Europeans above all others, which would validate the brutal domination they inflicted on colonized populations as of the natural order of the world.[27] In this hierarchy, Africans were placed at the bottom, even considered subhuman, thus making them no more than cattle, which supported their enslavement. In the West Indies, this description of Africans as subhuman also helped explain certain disparities within the medical paradigm. The resistance of the enslaved to yellow fever and malaria could be explained by the fact that they came from a tropical climate similar to the Caribbean environment, thus they suffered no humoral imbalance, but their resistance to miasma produced near swamps made less sense. West Indian doctors came to describe Africans as lower humans because they had witnessed the fact that animals did not become sick with fevers, and so the enslaved must have been closer to animals than the other human races; it also helped explain slave-specific diseases such as the yaws, dirt-eating and leprosy.[28] In the primary sources presented in this thesis, mention is made of how to treat the enslaved Africans in specific ways because of their slightly different biology, but in the case of diet, no difference is mentioned, thus it is hard to assess if nutrition was conceived as being different for white and black. Dancer himself makes no reference to a specific group in *The Medical Assistant*, it is rather intended for all populations in Jamaica, and it is generally hard to know his thoughts on race because he never writes about the subject. This absence of racial mentions in dietetic guidelines can also be explained by the fact that race was still a fluid concept that was under construction and its modern version would come only later in the nineteenth century.

Medical historiography of the West Indies has also looked at how doctors reacted to this deadly environment; at the same time doctors and Jamaicans had a troubled

relationship, to say the least.[29] The constant care required by both populations made giving cures a very lucrative business, thus doctors came in large numbers to the West Indies to become rich by providing remedies to the plantation owners and their slaves. Richard Sheridan provides a nuance by stating that in times of peace, there were too many doctors, thus it became much less profitable, while at war it was the opposite.[30] What historians agree upon is that this attracted many fake doctors, called "quack doctors," with no education in medicine and false cures that could be more harmful than helpful. This gave a bad reputation to doctors at times, to the point that the population was so alienated that they preferred to stay away from doctors when they were sick. This was aggravated by the fact that doctors had very little tools to attack the diseases of the tropics, which were totally different from what they had encountered in Europe. Historians have identified only a few doctors who had recognized the potential of certain cures, like cinchona for malaria, but that the usage of the old medical paradigm sometimes made any effort to employ these remedies useless.[31]

Historians disagree on the evolution of medicine in the West Indies before the chemical and medical revolutions that would happen at the beginning of the nineteenth century. In *Mosquito Empire* (2010), John McNeill states that doctors tended to keep their belief in the old medical paradigm even when faced with its complete obsolescence.[32] One needs to understand here though that medical knowledge was based on the knowledge of the classical philosophers, to critique it was very hard, and the tools to enable such a change had not yet arrived. On the other hand, Mark Harrison states in *Medicine in an Age of Commerce and Empire* (2010) that West Indian doctors developed an independent mind after observing the European medicine was useless in the tropical environment. They

emphasized practice in local circumstances, which placed them in conflict with colonial authorities who did not understand that there could be two sets of medical knowledge.[33] From the primary sources studied in this thesis, it is clear that doctors stuck with their training with very little doubt, but they did acknowledge its lack of success and started to think about alternative measures, one of them being food.

The health of soldiers is also an important element of the medical historiography of the West Indies, it brings new elements such as health at sea, getting food while crossing long distances and the housing of a large population of sick soldiers.[34] The empire faced the problem that when soldiers arrived in the West Indies, the conditions on board like the lack of sanitation, drinkable water and fresh food made the soldiers sick. Afterwards, they would rapidly fall prey to tropical diseases, it became very hard to have an army ready for battle in the West Indies. Historians have analyzed the different responses to this by the colonial government and doctors. The authorities better equipped the ship and under the counsel of doctors they enforced better sanitation rules. They also created military hospitals in the colonies to better house and provide for the sick and soldiers.[35]

The historiography on colonial science is abundant, it has both focused on Jamaica and the networks of knowledge in which it took part. The history of colonial Jamaica and the development of local scientific culture has been divided into two phases. After the British empire took the island from the hands of the Spanish in 1655, the first phase of exploration began. Jamaica was a far bigger island than any other English possession in the West Indies, it attracted naturalists to discover the flora and fauna hidden in the jungles and mountains. The most famous naturalist was Hans Sloane, who visited the island in 1687 and gathered an impressive collection, which became the basis of the National

Museum. Historian Raymond Stearns stated that scientific communication to and from Jamaica during the seventeenth century exceeded all others in the Western Hemisphere. Stearns identified a problem though, the naturalists sent to the island only stayed there to observe and collect specimens to then bring back to England, they did not stay to create institutions in the West Indies. This fact, combined with the introduction of sugar cane and subsequent transformation of Jamaica into a sugar island, led to a fading of the scientific interest in Jamaica during the eighteenth century.[36] This historiography is thus limited by the fact that there was little institutional science to speak of, compared to the West Indian French colonies which had developed an extensive scientific apparatus. That is not to say that there was no scientific research in eighteenth century Jamaica, it was rather performed through an informal community. Physicians like Dancer, whose training gave them a basis of knowledge on the natural world, were an important part of this quasi-scientific community. Plantation owners and managers who had an interest in botany could also contribute, like Hinton East, Matthew Wallen and Thomas Thistlewood.[37]

Jamaica evolved in a network that connected it with the other West Indian islands, the mainland American continent, Europe and Asia. This network enabled the transmission of knowledge and specimens across the British empire and even between empires. Although this thesis does not focus on these networks, Dancer evolved in it and we need to contextualize his work inside of them. These networks could be interpreted differently depending on the point of view studied. As Richard Drayton wrote in *Nature's Government* (2000), botanical science had become a show of virtue for the empire, it showed that it cared for its colonies and its citizens by making sure they had everything they needed to survive and succeed.[38] This factored into the relationship between the empire and Jamaica,

who had different visions on the need for breadfruit. Inside of these networks lay the content and form of the communications between naturalists. Rules and forms of address shaped the communication between correspondents, it was imperative to respect them to enable a long and successful correspondence.[39] As we will see, Dancer was ill-suited to do so.

The history of food science is a relatively new direction in the historiography, which provides insights into the conceptualization of food in the early modern era and the creation of modern nutritional science. There exist few studies on this subject because it is a recent field of research and because nutrition was mostly based on hypotheses and assumptions, not on matters of facts. It is complicated to characterize eighteenth century nutrition as a science, but doctors and chemists who pronounced themselves on such issues did so informed by their own medical and scientific knowledge. The diet they proposed was informed by their conception of what nutrition was, which was itself informed by the medical paradigm and their own observations. Thus, if their conclusions were fluid and poorly defined at times, they still stemmed from their observations contextualized in their scientific knowledge. Since nutrition was so poorly understood, it was not defined as its own subject of study in the eighteenth century, but rather as part of medicine and chemistry. Still, the discussions on nutrition have provided for interesting historical research. The principal point that historians have identified in food science of the late eighteenth century is that the authorities were trying to find new and better ways to feed their population, population growth had outpaced the capacity of the kingdom to properly feed its citizens, which led to fears of popular uprisings. In *Feeding France* (2014), Emma Spary discusses how French philosophers, politicians and chemists were trying to ameliorate French

nutrition in view of the feeding problematic they already, and the crisis to come. This amelioration came both by finding new staples or modifying existing ones as well as changing what and how food was consumed in the French household.[40] After the Seven Years' War, the British Empire grew to a size it could not manage, which led to the emergence of multiple crises in its colonies. Although they officially denied any such problems, Banks and the government were trying to find new, cheap and nutritious staples that could feed the massive population it had under its care. The breadfruit is the most famous of those projects, but the potato had been transplanted into multiple environments with great success, while other projects failed to do so, like wild rice.[41] Naturalists also studied the composition of staples to understand the reasons why some were better at feeding large groups. Starch came to be a determining factor in plants, the higher its presence in a given food, the better this food would be.[42] This thesis provides a new addition to this effort. Although the tale of breadfruit is well-known, the efforts of Dancer to provide better nutrition in households and plantations are less so, but they still give an interesting account on how these efforts were being conducted on the ground.

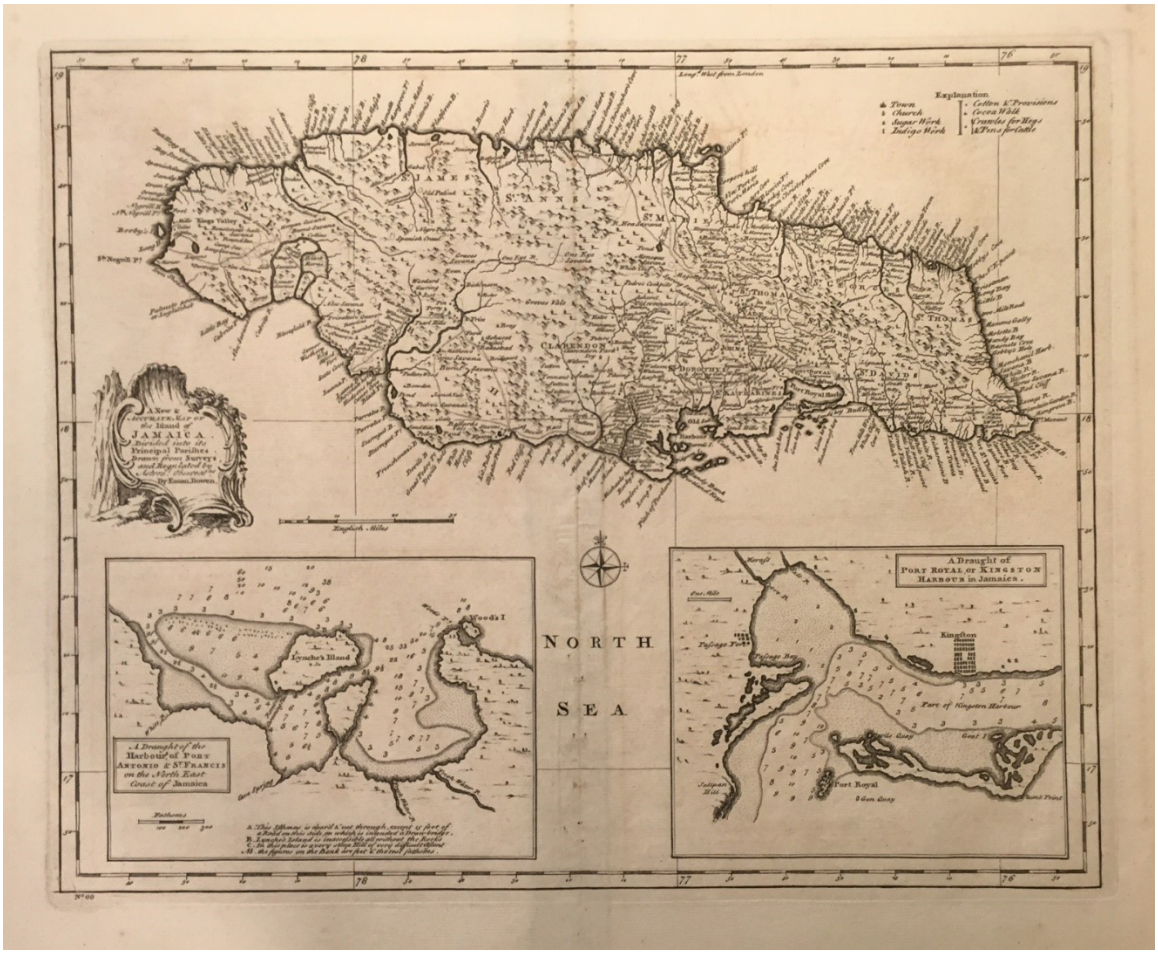

Figure 2: a map of Jamaica in 1747, drawn by British geographer Emmanuel Bowen for the King. It includes parishes, towns, harbours and the major plantations.

Chapter 1: Thomas Dancer's arrival in Jamaica, the health of soldiers and the beginning of the West Indian diet.

In 1788, the House of Assembly of Jamaica received the conclusions of a report it had commissioned on the loss of slaves' lives due to the succession of hurricanes that had hit the island since 1780 and the American Revolution. The special commission in charge of this task estimated that fifteen thousand slaves had died out of a total population of more than two hundred fifty thousand, a staggering loss.[1] The report laid bare the weakness of Jamaica and the rest of the British Caribbean. The extreme focus on sugar production had left the island without a sizeable portion of arable land dedicated to growing food for

themselves and their slaves, leaving them dependent on importation and a few core staples like plantain, but a majority of the trees had been uprooted by the strong winds of the hurricanes. The conjuncture of the American Revolution and the hurricanes could be exceptional, but hurricanes were a relatively common meteorological event in the West Indies, while the American Revolution was an episode in a decades-long conflict between the French and British Empire which could begin anew. The men in power in Jamaica understood that a stronger emphasis on homegrown products and diversification was required to protect their interests from further disasters, but at the same time, none of them wanted to sacrifice arable land used in sugar production. They needed a new food staple that would be more nutritious and sturdier than plantain to feed their slaves, while taking the exact same space in the provision grounds. Although this seemed like wishful thinking, Joseph Banks had the solution to their pleas with the Tahitian breadfruit.

The director of Kew gardens had encountered the seemingly miraculous fruit when he accompanied James Cook and the HMS *Endeavour* in 1769 to Tahiti, and he had been amazed by it. Two breadfruit trees gave nourishment for one man for a whole year, and a full acre of breadfruit was equivalent to two acres of any other staples, thus it was the primary source of food of the Tahitians. After cutting out the tough green skin, the sweet white flesh of the fruit could be boiled or roasted to then be eaten as well as cooked and transformed into flour, which only made it more desirable to the West Indies, who had to buy this commodity at a high price.[2] Simply put, breadfruit had the potential to revolutionize the slaves' diet. The story of how the breadfruit came to the West Indies is well known, mostly because of its first failed attempt. Banks sent the HMS *Bounty*, under the command of William Bligh, to Tahiti to collect breadfruit shrubs and seeds, but the

spatial arrangement required to do so meant that there was very little provision and clean water on board for the servicemen, who mutinied soon after they left the island. This had not deterred Banks, who sent Bligh[3] again to Tahiti, but this time with two ships, the HMS *Providence* and HMS *Assistant*, and two gardeners, James Wiles and Christopher Smith, to make sure this expedition would be a success.

In Jamaica, the breadfruit shipment would be received at the Bath public garden under the care of Thomas Dancer, who had been practising as a physician while taking care of the garden since 1781. Dancer had gained Banks's interest and trust with this project because of his work on cinnamon and his championing of agricultural improvement in Jamaica for the betterment of the Jamaican economy and health. Being part of the breadfruit experiment could help him reach this objective as it pertained to the slaves' health and the planters' interest, and it could open the possibility to many more botanical experiments that could further his goal. Breadfruit and his other botanical experiments are to be understood in the beginning of a process that would lead to the creation of the West Indian diet by Dancer and other West Indian doctors. This process started for Dancer after he had accompanied two regiments in the disastrous San Juan expedition in 1780, where the military force had been decimated by tropical diseases against which his medicine was ineffective. His first publication which concerned his thoughts on the causes of this debacle would lead him into a discussion with other doctors on the health issues of soldiers, where the first elements of the West Indian diet would be presented, that is the importance of seasoning the body to the tropical environment by eating less meat and more vegetables. Dancer's botanical work would thus be a more practical way through which he could help the dietetic problem of the Jamaican population.

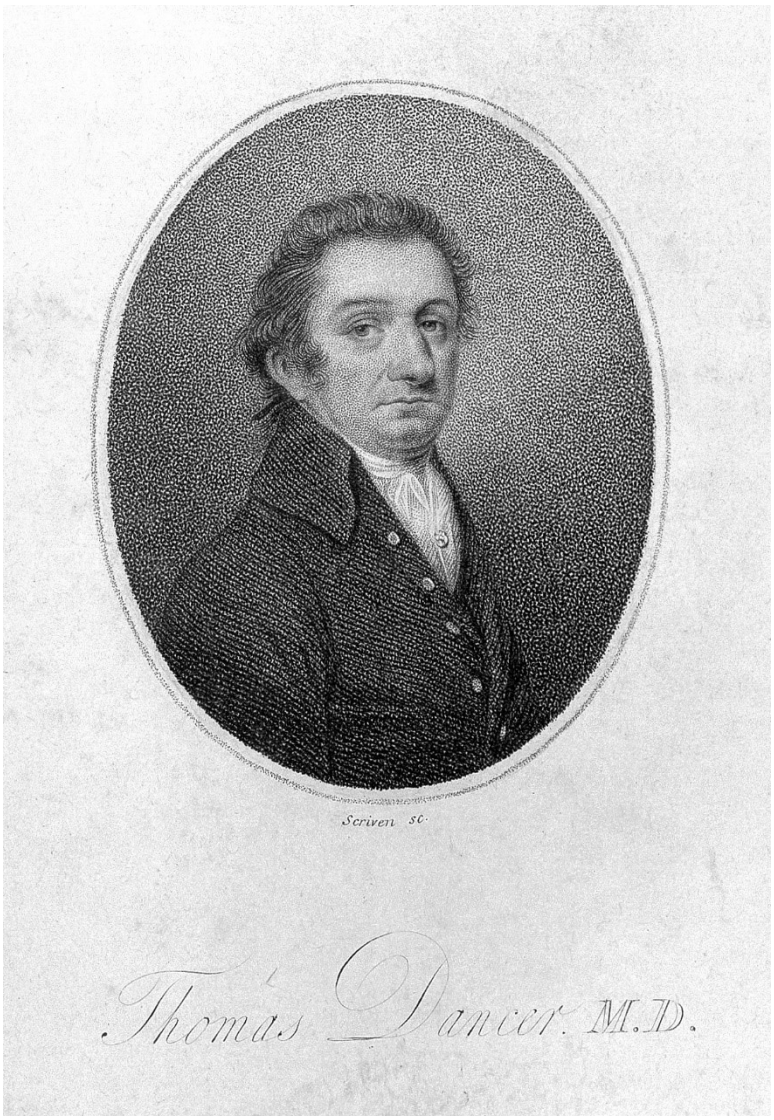

Figure 3: the only known representation of Thomas Dancer, found in The Medical Assistant, Third Edition

Thomas Dancer arrived in 1773 in Kingston, Jamaica and soon started a practice there.[4] Not much is known of these first seven years in the West Indies until he joined the San Juan expedition, but from the experience of the other Jamaican doctors, we can make a hypothesis as to his motives in establishing himself in the island and whom he treated. Doctors came in mass to the island to take care of the Jamaican population since it was in dire need of medical help. Tropical diseases like malaria and yellow fever were killing white colonists in astounding numbers since they had no natural immunity against these

illnesses. The lack of sanitation, the putrid food and the extreme heat waves only worsened the health condition of Europeans in Jamaica. Yellow fever and malaria were so effective at killing the white population that they prevented its natural increase. The only way to permanently augment the white population was through immigration, which was very costly, fifty thousand immigrants were required to permanently augment the population by five thousand. Life expectancy for a British immigrant was thirteen years on the island, while creole-born could barely hope to get past their forties.[5] Doctors had plenty of work there, and they could make a decent living and maybe even amass a small fortune. The numbers presented are quite appalling, but they do not mean that every European left the West Indies after a few years due to illness. Many planters stayed in the islands nearly their entire lives, such as Samuel Martin, who lived in Antigua from his birth in 1696 to his death in 1776, only going back once to England in 1771, where he fell sick and decided to come back to his home until he died; Thomas Dancer left Jamaica only once to get treatment because he had fallen sick, and came back afterwards.[6] This was the result of a change of attitude towards the tropical climate from being highly dangerous to being healthy if one's body had adapted to it after a number of years living in it.[7]

The mortality and morbidity of slaves were even worse. Again, natural increase of the population was null, and they suffered a net natural decrease of 3 to 3.5 percent annually. The birth rate of twenty-three new born per thousand individuals suggests that fertility levels were very low in the slave population. This was due to a combination of multiple factors: extreme overworking, malnutrition, personal depression and diseases. Africans were only slightly more immune to yellow fever and malaria than Europeans, but their life conditions made them more susceptible to fall ill. Although this absence of natural increase

was of concern to the House of Assembly and the colonial government, the plantation owners had the funds required to continuously purchase the slaves they lost during the year, thus they never made any substantial efforts to change the slaves' situation.[8] A program for the improvement of natality had been developed in Jamaica in the late eighteenth century after the anti-slavery movement had started to critique the planters' treatment of the slaves. Slave women who gave birth could have a day and half free of work per month, and in 1788 the House of Assembly passed an act where a plantation's overseer would receive twenty shillings from the owner for every slave born on the plantation, and the owner received a tax return for the same amount. In 1792, the Consolidated Slave Act gave even more incentives for planters and slaves to increase natality: more money and tax breaks for overseers and planters, more free days for mothers, and if a woman had six children, she would be free of work for the rest of her life. The introduction of breadfruit had also been such a measure that would secure the slave's nutritional needs. None of these measures helped to curb the negative birth rate, it only changed after emancipation because the slaves were now free of the masters' control and could feed themselves properly. Malnutrition was the root cause of the slaves' health condition, the lack of proteins and vitamins in their nutrition impeded their immune system in fighting tropical diseases and complicated pregnancies, but this was a problem that doctors could not attend to as it was out of their control.[9]

To better understand the difficulties West Indian doctors faced with yellow fever and malaria, the two principal tropical diseases, we now turn to the medical theory that underpinned their practice. The medical paradigm of the time conceptualized the human body as a fibrous being containing four humours (phlegm, blood, yellow and black bile).

External stimuli would lead to changes in humour balance and the stiffness of the bodily fibres. Humour imbalance would then lead to emotional and psychological changes like anger or depression, while the decrease or increase in fibre strength would result in varying levels of energy. Environment was the primary factor of bodily variance, and the tropical climate was the most dangerous to the European constitution since Europeans came from a cold climate. The heat and humidity present in such a climate would create an increase in bile which would clog the body while also softening its fibres, sapping the body's strength and opening it to miasmas.[10] The other principal medical paradigm was miasmatic theory, the medical theory about the transmission of diseases, which stipulated that diseases were formed in putrid and stagnant water, often contaminated with vegetable and animal matter in decay. When miasmas were breathed in, they infected the body with their noxious exhalations, giving rise to yellow fever and malaria. The remedies of this medical corpus worked with some success in Europe, but in the West Indies it was a complete disaster. Bleeding or giving expulsion concoctions to the sick only made them lose the few forces they had left, and the drugs they had were useless against those alien diseases. Even in front of this failure, doctors were reluctant to put into question what they had learned, the basis of their science was the knowledge of the ancients like Erasmus, and they clung to their ideas of strong sun and high heat as the cause of many evils in Jamaica.[11]

The news that planters paid handsomely to care for their slaves spread quickly, and this led to the coming of many "quack"-doctors, with no training in medicine, but their baggage full of mysterious concoctions fooled many colonists and slaves into trusting them with their health.[12] Sadly, for them, these concoctions were at best ineffective, and at worst deadly, which led many Jamaicans to distrust doctors. In times of peace, there came to be

too many doctors in Jamaica, and where there used to be plenty of work, now none was left, and many doctors had to go back to England or to another colony, leading to even more instability in West Indian healthcare.[13] Dancer never stated his reasons as to why he came to Jamaica after his training, but we can guess that the opportunities offered for a young M.D. enticed him to cross the Atlantic. During his seven years in Kingston, he must have treated a wide range of patients, from slaves to merchants, from farmers to overseers, where he learned of the sickly state of the general population, and this first experience certainly helped in opening his eyes on what Jamaica might need to fight the diseases that befell it. In 1780, Dancer had been recommended by his friend Dr. Benjamin Moseley, surgeon general of Jamaica, to be the field doctor of an important military expedition against the Spanish empire, where he would be confronted with the dire situation in which slaves were in the Caribbean environment.

The health of soldiers was of primary importance to the prosperity of the empire. The West Indies had become a place of great contention between the British, French and Spanish Empires, the maritime and terrestrial boundaries of each colony required constant watch. The fear of rebellion from the slaves also led to the stationing of a substantial force in Jamaica to quell any intention of such an act. But just like the colonists who came to Jamaica, the soldiers would suffer massive casualties at the hands of tropical diseases, more so than against human adversaries. This was proving to be a grave problem, as the cost of defending the most important and largest colony became very high, and any expedition against a military opponent started with high chances of failure before the objective could be reached. Military doctors, such as Thomas Dancer, were at a total loss in front of this massacre. It became clear to them that their cures had a minimal, if null impact on their

patients, with only a few remedies, like Jesuit's bark, having a true curative effect on them, but these cures were in short supply. Thus, doctors had to propose new health policies to help the army. If finding cures for these multiple ailments was out of their reach, then trying to prevent the soldiers from falling sick was another possibility. Doctors started to think on how best to adapt the condition of army service to life in the tropics, which would lead to formal proposals published in books. Food was a major element of this proposal, but there were other elements that were discussed as well to protect soldiers from illness. This discussion led to a process of rethinking the place of diet in curing health issues in the Caribbean, on land and at sea.

Thomas Dancer's *A Brief History of the Late Expedition Against Fort San Juan* was published in 1781, one year after he accompanied the 60th and 79th regiments on their march against the stronghold, serving both as physician and surgeon.[14] In this first medical book, Dancer's goal was not to tell the tale of the expedition, but rather to explain that yellow fever was the primary cause of its failure and serves as a guide for future military physicians. Fort San Juan was a Spanish military installation situated in Nicaragua, at the meeting point between River San Juan and Lake Nicaragua. The goal of the expedition, ordered by General John Dalling, governor of Jamaica, was to capture this strategic position to separate the northern and southern territories of the Spanish Empire and gain access to the North and South sea, and thus the Pacific Ocean.[15] The expedition left Port Royal on February 3, 1780, and when they reached the mouth of the river, three hundred men stayed to guard it while the rest joined a group of natives to continue the path towards their objective.[16] They reached the fort on April 11, and took it on April 24, with minimal loss due to fighting, but during the siege the men had started to get sick.[17] The situation only

worsened as more men fell ill, while the natives accompanying the expedition were wiped out, and Dancer did not have the necessary supplies nor accommodations to take care of the problem, thus in the month of September, with their forces dwindling every day, Commander Kemble decided to abandon the fort, leaving only a few healthy men to guard it, and went upriver with the sick soldiers to the English settlement of Bluefields.[18] As they sailed, even more men died, and Dancer fell ill, which afforded him the chance to go back home to Jamaica, where he regained his health. Although he does not provide the number of casualties due to disease, Benjamin Moseley wrote that the military operation in its entirety, including the expedition against the fort and the different envoys to take control of posts and routes to create the intended channel, counted eighteen hundred men; of these soldiers, only three hundred and eighty survived, with most deaths attributable to yellow fever and malaria.[19]

Benjamin Moseley was an important medical figure in Jamaica, and when he left the island in 1784, he became physician to the British elite.[20] In 1787 he published *A Treatise on Tropical Diseases*, a summary of his years of medical practice in Jamaica, where he recounts the history of the expedition against Fort San Juan as well as what happened afterwards. Four regiments, the 85th, 92nd, 93rd and the 94th, had been sent to reinforce the two regiments already at Fort San Juan, but they arrived with a six months' delay. By then the Spanish had retaken the fort and fortified the entrance to the lake, and the misfortunes of the first expedition discouraged General Garth, commander of this new force, to pursue the same objective.[21] Instead, the regiments were stationed at Up Park, which would become the new military base of the British army in 1784, but the lack of suitable barracks and hospital led to an increase of yellow fever cases, and soon the hospital

in the care of Moseley was saturated, with the regiments decimated by yellow fever, malaria and dysentery. The creation and use of hospitals for military purposes was a new directive ordered by the Board of Admiralty to replace the sick quarter system.[22] The Board had hoped that West Indian hospitals would offer better accommodations and resources for the soldiers as they arrived or returned to the island, but they had not underestimated the scale of the mortality, and the hospitals were soon filled beyond capacity with not enough blankets, medication and food to care for all the patients. This situation was widespread in Jamaican hospitals until doctors and generals would have a better handle on the situation.

Another account comes from John Hunter, superintendent of the Jamaican military hospitals from 1781 to 1784. In 1788 he published his own account of the reality of military life in the West Indies, writing from his own experience in welcoming most regiment arriving in Jamaica, as well as from his access to the few medical archives on the island; his book gives a full view of the extreme mortality rate of soldiers. Hunter remarked that most soldiers' death happened in the first year of service in the West Indies, but afterwards the soldiers who survived this first contact were often so sick they were unfit for duty, and he supported this with calculations derived from the documents he had found. For the 60th, including the men who marched against Fort San Juan, he calculated that forty percent were lost to the service out of an initial number of three hundred eighty-seven soldiers, while the 79th regiment lost one hundred more men than the original number of soldiers who arrived on the island.[23] For the 85th and 92nd regiments, stationed at Up Park and Spanish Town respectively, their combined force was almost six hundred men; after nearly two years on the island, they were down to seventy-one and two hundred thirty-six respectively, a loss of fifty percent.[24] For the 93rd and 94th, almost all the men fell prey to

diseases. Hunter includes ten other regiments who had fewer casualties than the six previous regiments, due mainly to their better encampment with access to medical resources in an established hospital. He calculates that in four years, thirty-five hundred men died, while half of that number were also discharged, thus five thousand two hundred fifty men were loss to the service, without a man dying from the enemy's hands.[25]

This harrowing account of the military expedition highlights the very high cost of military operations in the West Indies, and the shortcomings of the medical paradigm in this situation. In Dancer's book, climate is clearly identified as the source of sickness, as its oppressive heat and humidity weaken the body and creates miasmas in the air which infects the soldiers.[26] Dancer identified three diseases which affected the expedition: intermittent fever, surely being malaria, remittent fevers, of which some cases developed into yellow fever, and dysentery. In the first two cases, Dancer prescribes bloodletting, and emetics and cathartics for purging to rebalance the humours, but with a fair warning to not cause excessive purging and loss of blood as it is highly debilitating in the West Indies.[27] Moseley also warned against the excessive use of bloodletting and purging medicines, but both doctors had few alternatives to propose. In malaria cases, the only remedy they knew they could rely on was Jesuit Bark, sometimes called Peruvian Bark, or simply the Bark.[28] When ground into a powder, sometimes after being marinated into white wine to hide its bitter taste, and ingested during the intermission of malarial fever, Jesuit Bark would almost always cure the patients. But due to its rarity, naturally growing only in the Andes at altitudes of fifteen hundred metres, it could not be widely used.[29]

This lack of success led Dancer, Moseley and Hunter to the conclusion that if their medicine worked poorly in curing the men under their care, at least they could create

measures to prevent as much as possible the men from falling ill. The three doctors all believed that miasmas from marshy lands were responsible for this epidemic, thus they encouraged the encampment as far away from these bogs as possible, while the barracks needed to be built large and wide enough to let the cool air breathe into them, and they should be kept as clean as possible.[30] Hunter proposed a measure that he believed to be even more important, that of substantial nutrition to the sick and the healthy. He wrote that: " … few things are more prejudicial to health than a scanty and irregular diet."[31] Hunter had remarked that the sick soldiers of the 60th regiment had recovered more easily in their second year on the island as they were in a hospital better supplied with proper diet, and he proposed a model where the government would supply their troop with ample provisions, while the sick would be provided with bread and five schillings so that the nurses could buy fresh food every day, and pay themselves as well.[32] By putting the diet of soldiers into the hands of a governing body counselled by doctors, it would ensure that the army would get all the nutritional intake it needed and it would also prevent soldiers from selling their provisions on the black market. This government interference would also assure freshness of the food, a rarity in tropical environment, but of primary importance to good health. The simple act of assuring a healthy diet for the soldiers would give multiple rewards to the British colonial government. It would drive down the cost of maintaining the colonial army in the West Indies, it would strengthen the defence of its most valuable colonies, but of even greater strategic importance, it would allow the growth of the empire into a sphere of the world that had already given so many riches to Europe.

When soldiers arrived in Jamaica, they came out of the ship in a miserable, sickly state, and often, half of the whole detachment was unfit for duty. Moseley called the process

of Europeans falling sick as they changed climate "seasoning"; if they survived this first contact, they would then be able to survive for a long time in Jamaica.[33] Historian Edward Long, who championed better healthcare on the tropical island in his *History of Jamaica*, described the process through which the body went as follows: "As the heated air between the tropics acts upon metals by expansion; so, when it acts upon the human body, it relaxes the solid parts, and rarefies the fluid, increases the velocity of the blood's circulation, causes an unusual discharge of the bile, and the regurgitation of it into the stomach, violent acute pains in the head, loathing of food, and sickness; hence feverish disorders may ensue, which would be soon and easily cured, if no other predisposing causes supervened."[34] Scottish surgeon John Bell calculated in his own account of military life in the West Indies that each soldier sent to the West Indies cost 3211.1 shillings, an enormous cost knowing that only half of the soldiers would be able to do battle on arrival.[35] To prepare soldiers for their trip in Jamaica, doctors proposed to change their diet from a European to a West Indian one as they crossed from a cool to a tropical climate to help the body go through the transition. Exactly what that West Indian diet would be, was still under development, but Long, Bell and Dancer offered some grounding elements.

Long himself was no doctor, but he had lived in Jamaica for many years which makes a first-hand account of the problematic health state of soldiers and colonists arriving on the island; he also had many doctor friends, like Richard Brocklesby, and the knowledge he had acquired from frequenting them as well as derived from his own account enabled him to publish a guide to a healthy diet in the West Indies in the second volume of his Jamaican history book. Long prescribed to seamen to change their diet from eating large quantities of fresh meat and other foods difficult to digest, prevalent in cold climates like

Europe, from one based on vegetables and sub-acid fruits, while the intake of salted meats was capped to once or twice per week, alternating between beef and pork.[36] Just like John Hunter, Long worried about the ability to keep meat fresh on board ships and in tropical climate, and the limits he put on its consumption was to stop the new arrivals from suffering food poisoning as much as aiding digestion, which he claimed had taken many lives in the West Indies.[37] This diet was to be continued on land as well because vegetables produced the greatest quantity of antiseptic air in the bowels, which eliminated the accumulation of noxious miasmas in the body, but now with a slight increase in the consumption of meat, otherwise a vegetarian diet would make Europeans too weak to resist the hot sun of the tropics.[38]

John Bell had remarked that the heavy reliance on salted meats during transport combined with the fact that sea salt was a bad preservative poisoned most of the soldiers on board of the vessels, regardless of their destination.[39] Bell rejected the notion of noxious climate as the primary cause of disease in the West Indies, it was rather the poorly conceived diet of meat, too often putrefied, and alcohol that was responsible for the bad health of the soldiers. In accordance with Hunter, he believed that the government should have more control over the diet of their soldiers. First, it should make sure that meat was conserved with purified salts, with recurrent examinations of the quality of the meat during the curing process to ensure its healthiness.[40] Soldiers should also diminish their intake of meat and augment their intake of vegetables to create a proper balance, and he proposed to replace the importation of salted meats with fishing in the very abundant Caribbean Sea, as white fish was excellent for digestion.[41] When he published his book in 1791, Bell was one of the few doctors to reject the European diet in favour of embracing the native

foodstuffs of the Caribbean to feed the soldiers. If this last measure would be adopted, it would serve two purposes. First, it would drive down the cost of maintaining the colonial army and make it less dependent on imported goods. Secondly, John Bell lifelong battle was for proper sanitation of the medical environment, and fresh food was not only healthier, it lessened the risk of contamination of battlefield wounds by flies and mosquitoes.

More than fifteen years later, William Wright would write a guide of directions for officers going into the West Indies, included in John Sinclair's *Code of Health* and in his own memoirs. His directives were very precise: for breakfast one should eat a hearty meal of biscuits and butter with coffee or tea, with nothing between breakfast and dinner, then dinner should be moderate portions of meat and vegetables, with more of the latter than the former to allow better digestion, and finally for supper, a slice of meat.[42] This very precise diet shows that much thinking had gone into creating a healthy diet for soldiers sent to the West Indies. Doctors had all concluded that the excessive eating of meat was deleterious in a tropical environment because it putrefied too quickly, and it created heat in the bowels. Vegetables, although harder to digest, had antiseptic properties and the air inside them would clean the bowels. Meat was still believed to be superior to vegetables because it conferred strength. This research on the causes behind the military catastrophe in the West Indies led them to conclude that there was something fundamentally wrong with how the European diet was balanced, and that it could not be introduced everywhere. By pulling together all the knowledge they had acquired by practising in the West Indies, they had created what amounted to a nutritional guide tailored to the tropical environment. The reliance on vegetables rather than meat and on indigenous products to season the body to its new climate would prove to be defining features of the West Indian diet.

It is hard to know if these recommendations were heeded by the Board of Admiralty. They knew of the problem, but they were more concerned with the health of seamen aboard exploration expedition and long-term trips. Aboard both ships, scurvy was the disease responsible for the sickness and disease, thus the quality of food was the source of the problem, but also the solution. James Lind, in the first-ever clinical trial, had determined that citrus fruits were the best remedy against scurvy, but they were hard to get in a large enough quantity to feed an entire ship's crew, less an army, and their conservation presented a problem. Food on board mostly consisted of salted provisions, which required fresh water to accompany it, but this was again rather hard to come by on the ocean. The Board eventually ordered that all ships bound for a long trip would be loaded to the brim with provisions, and a distiller would be installed on board to help procure fresh water. Most importantly, they could land at any opportunity to acquire fresh provisions and benefit of healthy effects of being on land.[43] Doctors believed that being at sea was not meant for the human constitution, and it would make seamen sick even if scurvy had been dealt with, thus being on land was preferential. This policy had been conceived for long voyages without a clear destination, but the Board was also afraid of mutinies on board shorter trip if they were not well provisioned. By the late eighteenth century, the Victualling Board made sure that all navy ships had everything they needed for their trips, but this was more in terms of quantity than quality. The only food they put on board for health purposes was lemon juice because of Lind's work.[44]

Alcohol had a paradoxical presence in the corpus on military health, by some doctors it was prescribed as a medicine, while others would warn against its dangerous effects. Dancer proclaimed that wine was the most important element in supporting the

strength of a patient while he was sick.[45] He does not give any reason why that is, but one can suppose that he knew it would keep the patients in good spirits rather than have any actual medical effect. Hunter remarks that soldiers tend to drink rum in great quantity and intoxicate themselves so much that they do foolish things that hasten their sickness, but he rejects the idea that rum creates diseases, only that it limits digestion.[46] Long had a contrary opinion to Hunter, he wrote that rum was one of the best beverages to consume while eating because it helped digestion, and that rum could have medicinal qualities when taken in moderation, but he warned against abundant drinking and rum that had too much ardent spirit in it, which had a violent effect upon the solid parts of the body, coagulated the fluids and diminished the power of the nervous system.[47] Bell was against the use of malt liquors, putting them on an equal footing with putrid meat as the greatest source of sickness in Jamaica, but he wrote that rum, if distilled enough, could be a suitable replacement. Wright accompanied dinner and supper with one beer, but discouraged the drinking of wine during eating, only allowing it after supper and limiting it to three glasses.[48] Dancer wrote in a later treatise that alcohol could be consumed, but with modesty, and strong liquors should only be used by those with a strong stomach. He does not refer to any medical use of alcohol.[49] It seems that the effect of alcohol on the body was still mysterious. Alcohol was probably recommended as a "medicine" because it would stiffen the body, acting like cold temperature to give strength.

After Thomas Dancer came back from the San Juan Expedition, he obtained a post as physician at the Bath mineral water spring on the southeast parish of St-Thomas in Jamaica. The Bath spring was a spa for the Jamaican elite where they would go when they fell ill as it was believed that the water had healing properties. It was also at Bath that the

House of Assembly had founded the only Jamaican public botanical garden. Since its inception, the Bath botanical garden had been under the care of Dr. Thomas Clarke, but when Dancer arrived at the spring, he found it in a state of disrepair.[50] Although he did not occupy any official position towards the garden, we know he took over its care soon after his arrival because of his second publication in 1784. The book, entitled *A Short Dissertation on the Jamaican Bath Waters*, was a medical essay on the elements that give the Bath waters their healing properties, but in the appendix, he gives a list of the plants contained in the garden named "The most remarkable for use or beauty, which are present in the botanical garden at Bath." It only presents the plants Dancer found interesting, excluding all the ones commonly present on the island such as mangosteen, peach, gum Arabic, vanilla and cinnamon.[51] This last plant would become of great interest to Dancer in the following years, as he thought it could be of great economic value to Jamaica. He also thanks Admiral Rodney for bringing many curious and unknown South Asian plants to the garden after the capture of a French ship along the coast of the Isle of Bourdon. When he wrote this dissertation, he could not identify those plants, but they would later become the most important plants to have been added to the garden. The presence of the botanic garden sparked an interest in this matter in Dancer, and we can see from his first publication on the subject that he leaned towards plants that had the potential to be beneficial to the empire. This was certainly not a unique trait to Dancer, botanical science in the eighteenth century was characterized by a focus on useful plants. Dancer was simply following a trend, and since he was still learning much about botany, it is too early to state exactly what his plans were for the garden.

To acquire new specimens, Thomas Dancer needed to correspond with a network of gentlemen knowledgeable in botanical matters that spanned the whole territory of the British Empire. Pursuing botanical projects had become very fashionable in the British Empire since King George III had become the "Gardener King" and it was easily approachable for the noviciate who had the time and the means to create a garden. Practising horticulture was a show of virtue and intellect, it demonstrated that one can manipulate nature for his own end, while also nurturing and allowing it to grow under his care. [52] It also enabled one to attain higher intellectual circles and stature in the scientific community by gaining further recognition for his work and most importantly the quality of specimens he could send.[53]

By the year 1788, Thomas Dancer had contacted several doctors and scientists from across the British Empire to exchange on botanical matters, acquire new specimens for the garden and gain patronage. One of these men was William Forsyth, a Scottish horticulturist who was the superintendent of the royal gardens of St-James and Kensington.[54] In a letter dated January 9, 1788, Dancer reveals that he has recently deposited his candidature as island botanist in replacement of Dr. Clarke, and that the garden was flourishing since he took over, but now he needed to add new specimens to bolster his collection, thus he asked for Forsyth's help. The aid that Dancer asked for was not only in furnishing new specimens, he also wanted Forsyth to help him gain the attention of Joseph Banks. The superintendent of the Kew botanical gardens and President of the Royal Society would be of much more use to Dancer than anybody else. In exchange for Forsyth's help, Dancer proposed to send him a box full of seeds and plant specimens, and his letter was accompanied with a list of all the plants at Bath. In the following letter, dated July 23, 1788, Dancer writes that he has

sent the box of plant specimens to Forsyth, but he also sent one to James Lee, gardener of the Vineyard nursery in Hammersmith, an important depository of plant. Dancer wanted to cast a net as large as possible when it pertained to obtaining new botanical specimens.[55] Although we do not know if Dancer had an interest in botany before he arrived at Bath, by 1788, it had become its principal interest and he devoted much time to it, practising medicine only to sustain himself. As he was working towards replenishing the garden, his choice to focus on useful plants was cemented by the food crisis that befell Jamaica as it suffered from the combined impact of the American Revolution and five hurricanes.

The crisis of the 1780s started in 1776 when the continental congress representing the Thirteen Colonies in rebellion decided that they would no longer trade with British colonies. The West Indian governments and planters were alarmed, not only because this declaration would diminish their revenues, but also because they depended on the Thirteen Colonies for building material and certain foods that they could not grow on the island. The situation would only get worse as the conflict escalated into full-scale war and the French Empire joined the rebellious colonies to fight the British Empire on the maritime front. The Caribbean colonies who were dependent on European importations more than ever saw this avenue compromised as well. Jamaica was the British Caribbean island who was best able to support itself, but it still had to impose an embargo on food to make sure it would not become short on provisions. The smaller colonies did not have this chance, and the population there starved quickly; Antigua had to put emergency measures in place to avert famine, and the Barbados assembly had to send a petition to King George III to be rescued from famine by six ships full of provisions.[56] If the war for independence had not

already disturbed the Jamaican's ability to feed themselves, then the ensuing hurricanes would push them to the brink of famine.

The first hurricane to hit the island landed on the North Coast of the island on February 3, 1780. It damaged and destroyed more than forty vessels in Montego Bay while ravaging many plantations on the North Coast.[57] Exactly eight months later, on the night of October 3rd, another hurricane hit the parish of Westmoreland in the western part of the island, this time causing damage on an unprecedented scale. William Beckford, a plantation owner and famous for his staunch defence of slavery, was present when the storm landed, but he was able to survive, unlike many others. His descriptions of how he found the town of Savanna-La-Mar on the morning of the 4th is a powerful testimony of the tremendous destruction left in the wake of the tidal wave caused by the hurricane, and what was left for the people of the region: "At Savanna-la-Mar, there was not even a vestige of a town (the parts only of two or three houses having in partial ruin remained, as if to indicate the situation and extent of the calamity): the very materials of which it had been composed, had been carried away by the restless fury of the waves, which finally completed what the wind began. A very great proportion of the poor inhabitants were crushed to death, or drowned; and in one house alone, it was computed that forty, out of one and forty souls, unhappily and prematurely perished. The sea drove with progressive violence for more than a mile into the country; and carried terror, as it left destruction, wherever it passed. Two large ships and schooners were at anchor in the bay, but were driven a considerable distance from the shore, and totally wrecked among the mango trees upon land."[58] What was left from the storm was bodies, and their putrefaction attracted diseases which then spread to the living.[59] Beckford notes that it was particularly hard to keep the provisions

that were left dry, because any kind of protection had been torn down, thus food spoiled very quickly.[60] The survivors were saved by the generosity of the merchants of Kingston who donated ten thousand pounds in provisions, clothing and other resources.[61]

Another hurricane hit the parish of Westmoreland, as well as the parish of Hanover, in less than a year, on August 1, 1781. Although causing less damage than the first one, Governor John Dalling observed that plantain trees and corn had suffered greatly.[62] The slaves were the part of the Jamaican population that was the most at risk when facing hurricanes. They were dependent on very few food staples for their survival, and their settlements were far from being adequately constructed, with or without storms factored in. The plantain tree, the primary source of food of the slaves, was easily uprooted by the strong winds of the hurricane.[63] Since they were already weakened by malnutrition and work, they could not survive very long when catastrophes like hurricanes happened. During these times of crisis, the slaves' needs came in second to the white population's plights, thus their access to medical attention and emergency provisions was very limited if not nonexistent. Slaves were by far the principal casualties of the hurricanes.

After the hurricane of 1781, no more hurricanes hit the island for two years, and with the American Revolution now at its conclusion, the colonists hoped they could renew their trade with the newly formed state that had come of the Thirteen Colonies' independence to help stabilize the British West Indies situation. The British Parliament had other plans in mind though and the empire returned to its mercantilists roots. It enabled trade between its American colonies and the newly formed country, but only through duly approved British ships, limiting the American goods to a very precise list. This greatly

angered the Jamaican House of Assembly, as it made the island dependent on importations from Europe, which was far away and could be easily disturbed by wars.[64]

After nearly three years of reprieve, three hurricanes would pass over the island in three years, each successive storm being more destructive than the last one. On July 31, 1784, a hurricane equivalent in power to the 1781 Great Storm hit the economic capital of Jamaica, Kingston. Peter Marsden was visiting a friend in the town, and after surviving the hurricane, he witnessed a scene of incredible destruction just like William Beckford had fours years ago. Streets and houses had been totally levelled, while the harbour had been devastated; out of multiple dozens of ships, only two had been able to escape.[65] The hurricane had hit far and wide, many plantations inland had suffered substantial damage, destroying the plantations and provision grounds alike, which left the slaves without food and without time to grow it back. The Lieutenant-Governor of Jamaica enabled emergency measures to freely import provisions from foreign countries for four months, which did leave enough time to gather the quantity of food required to feed whites and blacks; planters petitioned him to extend these measures as long as was deemed necessary, but he accepted to keep them only until January 31, 1785. After this date, all food prices grew exponentially, planters could only afford to buy for themselves, and the slaves were in a state of famine yet again. During the summer of 1785, Nature had been kind to Jamaica and a large quantity of corn had grown back, but on August 31st, it attacked yet again with the fiercest hurricane ever seen in the Caribbean, bringing desolation on the whole island. The Governor immediately closed the ports to the exportation of food and allowed American goods to come in, but the destruction had been so terrible that those measures were not enough. Famine, dropsy and dysentery firmly established themselves on the island until the end of

the summer of 1786. On October 20th, the last hurricane to land on the island for many years laid waste to the Leeward Parishes, completing the tragedy. Never had Jamaica seen such destruction, and the total cost of it was hard to fathom for the planters.[66]

After the dust settled, the House of Assembly commissioned the report that determined that fifteen thousand slaves had died directly or indirectly due to the hurricanes and the American Revolution. Although this number is high, there were critiques of the report that stated that it was quite low, and that the total number of deaths was closer to being between twenty and twenty-five thousand slaves.[67] We can ourselves guess that this number could be even higher, as the long-lasting effects of such a disaster can be hard to measure in the following years, even more so in a deadly environment like colonial Jamaica, where the death of slaves was mundane. Multiple studies have shown that prolonged famine can cause long-lasting effects as it impedes the cellular regeneration and development. The workload of slaves was also multiplied at the end of the 1780s, as they had to rebuild the plantations, their own houses and then work even harder on the plantation to make back all the money that was lost.[68]

The crisis of the 1780s highlighted the problem of supplying the slaves, but also the colonists. Jamaica was the most populous British West Indies colony, with nearly two hundred fifty thousand inhabitants by the end of the eighteenth century, a very large population to feed on an island where most of the arable land was dedicated to sugar production. Still, the principal employment for whites was farming to feed mostly the white population, even though the slaves outnumbered them twenty to one.[69] Food heavily divided the two populations of the island. Sources of procurement were very different, the slaves mostly had to count on themselves, but with very few personal time, it was difficult

for them to fully sustain their families, while the whites had greater variety, but they were very dependent on importations to replicate the English diet. The constitution of the diet of the whites was also much more plentiful than the slaves, which were in a constant state of malnutrition.

Among the white population, there was again a certain divide between the very rich plantation owners and the farmers. The colonists did not like the food staples that the island had to offer, even though it afforded the same quality as what could be found in Europe, with an even greater variety of vegetables and year-round production. They disliked plantain, yams and such, only eating fruits like pineapple, which they really loved, and since mouton and beef could not reach the same quality as in England, they imported great quantities of salted meats and herrings, again rejecting the possibility of fishing and raising what was on the island as much as possible. The richest planters would throw incredible feasts, where they would eat prodigious amounts of meat, doused with just as prodigious amounts of alcohol.[70] If the diet of the whites was far better than the slaves, it was still not optimal for the climate of the West Indies. Its reliance on meat, which spoiled quickly under the Jamaican sun, led to digestive problems, while their reluctance to eat what the island offered restrained their diet and did not offer the diversity needed to be healthy in a disease-ridden environment.

Jamaican slaves received their food from three sources. The first one was their provision ground, where they would grow mostly plantains, as well as yams and corn, with a little raising of poultry and pork. If they had surplus, they could then go to the market to sell them for meat or other kinds of provisions. With these two sources, the planters would provide meagre rations of salt herring or another sort of protein and would give them very

little quantity of their own foodstuff if the situation required it. This diet was far from being plentiful, the size of the provision grounds could hardly produce enough food for a whole family of slaves even if they had inventive schemes like growing corn or coco between plantain trees.[71] The mostly vegetarian diet, of which the greater proportion was plantain, lacked the protein and calorie content required for the heavy workday demanded of the slaves. On average, everyday plantation food allowance consisted of between fifteen hundred and two thousand calories and forty-five grams of proteins, but men normally require thirty-two hundred calories and women twenty-three hundred, with an additional four hundred fifty calories when doing physically demanding activities.[72] This lack of diversity also created deficiencies in vitamins and iron, which led to a plethora of health issues and the development of diseases like "dirt-eating," which was a reaction to the extremely low content of iron in the bloodstream.

In 1790, two years after the commission's report, Dancer had gained the patronage of two important British figures of agricultural improvement; Edward Long, and Samuel More, secretary of the Society of Arts, which would then give him a place in the breadfruit project. He had presented his work on cinnamon to both, which had consisted in finding out if the specimen present in the garden was from Dutch Ceylon. If this were to be the case, this finding could prove quite beneficial as cinnamon was a desired spice in Europe, but it was under Dutch monopoly. Long had been the loudest advocate of agricultural amelioration in Jamaica, and Dancer was the first one to take up on his offer. Agricultural improvement in Jamaica would not only make the island richer, it would also make it less dependent on external sources, a spectre that loomed large over the minds of Jamaicans, by introducing better staples that would grow faster. Long had enabled Dancer to get into

contact with the Society, which gave premiums for botanical research that had the potential to benefit the empire. After corresponding for some time with More, he gave a presentation of his research in front of the members of the Society, where he proved that his cinnamon specimen was indeed the true Ceylon Cinnamon. The Society awarded Dancer a medal and the promised premium of two hundred pounds. Dancer was delighted to hear this news, as this was a significant recognition of his work, but he confided in Long that he doubted this would result in any concrete augmentation in the interest of the residents of Jamaica in developing anything other than sugar. Dr. Dancer distributed what he could of Cinnamon throughout his connections on the island, but the transplantation of Cinnamon was a failure. More importantly though, this discovery finally revealed Dancer to Joseph Banks.[73]

Soon after Banks answered the demands of the House of Assembly by arranging the expedition to Tahiti, the news spread quickly in the West Indies, and every person who had an interest in botany wanted to be a part of this botanical experiment.[74] Banks had installed one of his men at the public botanical garden in St. Vincent, thus it was to be the primary place of reception for the breadfruit, but in Jamaica, the public garden had been founded without his involvement, and he preferred not to interfere with the possession of the planters.[75] Hinton East's private garden was to be the primary place of reception of the breadfruit, but when Banks entered in contact with Dancer, he learned that he could trust him with such an important task, and the public garden became one of the principal places of reception. From then on, Dancer had the tools in hand to achieve his vision for the island.

In 1792, after working for ten years in the Bath botanic garden, Dancer published the first catalogue of plants in the botanical garden. Each entry was presented with its scientific name, followed by its common name, the person who introduced it to the garden

and some notes if required. The entries were divided by the following categories: Oriental, African and South-Sea trees; European and North American trees; South American and Exotic West-Indian plants; official and culinary herbs and roots; flowers; some of the rarest indigenous plants. The catalogue is a mix of useful and ornamental plants, with an emphasis on the first category. The garden contained many fruits and medicinal herbs, most importantly the Jesuit bark, as well as many common spices and trees that were used as building material. The provenance of each specimen sometimes eluded Dancer, probably because some of them had been introduced unto the island a hundred years before his birth and their source was unknown; Jesuit Bark had been labelled as an indigenous plant. The first page of the catalogue presented the plants that Admiral Rodney had captured because Dr. Dancer had finally been able to identify them, and he now knew that their importance far outweighed any other plant in the garden. Not only had there been cinnamon on board, but also a mango tree, a type of breadfruit called jaackfruit, mangosteen, Otaheite plum, Chinese hemp palm, moringa and bois noir.[76] Each of these plants had the potential to become an important staple of the island if the resources to develop them were available. This catalogue reveals the intentions that Dancer now had with botany. He wanted to develop and introduce plants that would benefit Jamaicans not only from an economic standpoint, but also from a medical and nutritional one. These plants had proven to be important staples in their place of origins, and they could become important staples in Jamaica if enough resources and efforts were put into botany and the botanical garden.

The catalogue had been presented to the House of Assembly, and its goal was to highlight the potential hidden in the garden to transform Jamaica into more than a sugar-producing island. The tropical climate was perfect to grow many of the fruits present in the

garden, and although they would not be as profitable as sugar cane, they would diversify its economy and the food staples of the island. If this proposition was good at the end of the 1780s, the slave revolt in St-Domingue had created a massive upheaval in the European sugar market, and Jamaica was slowly taking the French island's place. This sugar boom generated massive profits and in parallel voided any chance that the House of Assembly would support any project that would take away arable land from sugar production. The only way Dancer could now bring change to the island was through the provision grounds of the slaves.

Chapter 2: Thomas Dancer's botanical failure and the promotion of the West Indian diet.

The plan to bring breadfruit to Jamaican provision grounds was not of Dancer's making, but it aligned with what Dancer had always wanted to do with the public garden, to bring useful plants to help Jamaicans in economic, medical or nutritional terms. Breadfruit was perfect for this mission because it would secure the slaves nutritional needs, therefore making them healthier, which would positively impact sugar production and help alleviate the concern of anti-slavery groups. By proving himself worthy of Banks's trust by successfully transplanting and distributing breadfruit in Jamaica, Dancer would have opened the door to many more experiment of the sort in Jamaica. Captain William Bligh and the two ships under his command arrived at Port Royal with more than three hundred specimens of breadfruit shrubs and other useful plants gathered along the voyage. Breadfruit was then transported to the Bath garden and to other plantations where it was transplanted. From then on, the trees started to grow, and breadfruit could be spread throughout the island's provision grounds. The expedition had been a success, but Dancer did not reap the rewards of his efforts, which limited his access to new botanical specimens rather than enhance it. The House of Assembly would not properly support the public garden in the years after the reception of breadfruit which forced Dancer to dedicate more time to his medical practice to sustain himself, while his inability to properly maintain his correspondences alienated Joseph Banks and others, losing their patronage. The slaves would also refuse to eat breadfruit, thus the effort to bring this valuable plant proved useless.

This turn of events would diminish Dancer's ability to introduce new food staples and medical plants of significance, but this did not deter him from trying to help the

Jamaican population. Like many fellow doctors, Dancer lamented the absence of medical resources offered to the island's inhabitants and the "quack" doctors (the term used for fake doctors), who would profit from it, who would do more harm than good with their poisonous cures. To fight this problem, Thomas Dancer published in 1801 *The Medical Assistant, or Jamaica Practice of Physic: designed chiefly for the use of families and plantations* intended to be used by " … those who have families, or who are entrusted with the charge of negroes, and who are frequently at a loss for medical assistance; but, in some measure so, to medical men; at least to such as are newly arrived in the island, and to those engaged in country practise; who have in some situations, but little access to books, and less opportunities for reading."[1] This book would help families and plantations who had little access to medical knowledge and would also enable them to dismiss quack doctors. This book encountered great success and would be edited two more times, once in 1809 and once more, posthumously, in 1819; it would prove to be Dancer's enduring legacy for the island he called home. Although most of the book is concerned with identifying diseases as well as medical plants and how to properly mix them to make cures, the section on nutrition presents the diet that should be adopted in the West Indies, and it is perhaps the best example we have of what could be defined as the West Indian diet. We also know that due to the book's popularity, there is a higher chance that this diet guide could have been followed by Jamaicans. Dancer mentions several doctors as leaders on the medical state of their respective islands, and by comparing their work with Dancer's pertaining to food, we are better able to assess the reach of the West Indian diet and its evolution since our discussion on the soldiers' diet.

By researching the medical discussion on diet in the West Indies, it is clear the Caribbean doctors had developed an idea of their own about how to properly feed the three populations present, which was quite different from the European diet, putting aside meat to emphasize the importance of vegetables. By digging deeper into this change, we can see that the creation of heat in the body as meat is being digested, combined with the tropical climate, created a deleterious overheating effect that was to be avoided, a crucial element in this new view. Doctors also thought that by continually eating indigenous staples, a biological change would happen that enabled Europeans and Africans to better survive the Caribbean environment. In this context, we can understand the choice of breadfruit for nutritional reasons, but also because its tropical characteristics would help the African population in adapting to their new environment. Ultimately, the studying of the West Indian diet enables us to define the nutritional paradigm before the advent of modern nutritional science by identifying how digestion was conceptualized, what the nutritional elements were in food and why they believed so.

The Bath public garden and Thomas Dancer's botanical work evolved in a scientific context that encompassed the West Indies, the other British colonies and England; the place of Jamaica in this network help us to better understand why Dancer was not able to pursue his botanical project. The principal problem pertaining to science in Jamaica was that it did not interest Jamaicans. There were no scientific institutions, nor was there an active scientific community. The reason for this was because immigrants to the West Indies came to find economic success with sugar-cane plantations. If they survived their stay, were lucky and worked hard enough, English settlers could become very rich and then retire back to England, no community could be really created because of this transience; doctors,

who had the scientific training required for such an interest, were also too money-minded.[2] Still, there were Jamaicans interested in botany, Dancer being an obvious example, but we can also name Dr. Thomas Clarke, the first Island Botanist, as well Dr. Arthur Broughton who would help Dancer in making the collection to send back to Kew gardens, Matthew Wallen, a planter who worked closely with the House of Assembly to monitor the progress of breadfruit, and Hinton East, another planter with the largest private garden on the island. This new interest in botany was the result of the petit enlightenment, which had given access to more knowledge by the spread of books and new philosophical ideas, and Linnean nomenclature, which had enabled an easier access to botanical science.[3] In Jamaica, this had not been enough to sustain a strong scientific community that could have created resources to help make scientific experiments and spread botanical knowledge or interest in the Jamaican population.[4]

The support that would have come from such institutions and organizations could have been supplied by the House of Assembly, but they too lacked the interest to fully support such an endeavour. The members of the Assembly were planters, profit from sugar was their principal motive, supporting science was of no appeal to them unless there was an economic benefit for them. The transplantation of breadfruit had been supported because it would support their workforce. The story of the Bath public garden is a prime example of the ambiguous and disinterested relationship the House of Assembly had with botany. The garden had been ordered in 1774, but only completed in 1779, while the choice of the place had been criticized early on because the soil was poor, the nearby rivers frequently flooded the terrain where the garden's ground and it was too far from the capital. Dr. Thomas Clarke, the first Island Botanist, suffered the same fate as Dancer would, his

interest in introducing medical plants soon faded after the lack of resources given to him and he abandoned the garden.[5]

Although botany was not popular in Jamaica, it was in England, where the President of the Royal Society, Joseph Banks, was a botanist. Because of his position and his close relation to King George III, he had helped put in place a policy to create and sustain botanical gardens throughout the empire to respond to the crises that were happening across the vast territory acquired after the Seven Years' War, but also to follow in the footsteps of the French empire who had turned its attention towards botany as a new way to fight the British empire after its defeat during this conflict.[6] The French empire had developed networks of botanical exchange and had created scientific institutions in its colonies to accomplish this new vision, which had resulted in massive profits,[7] of which the British empire was envious. If this new will to support botany should have helped Dancer, it hindered him because he had competition in the West Indies. When the *Providence* and the *Assistant* arrived in the British West Indies, their total cargo contained more than two thousand specimens of breadfruit and hundreds of other tropical and European plants, but its first stop was at Kingston Port on the island of St-Vincent, where it delivered the greater part of its cargo to the botanic garden there. Banks had chosen the St Vincent garden as the principal depot of breadfruit in the West Indies, and thus transforming it into the *de facto* botanical centre of the British Caribbean, because he had been instrumental in building it up and choosing its caretaker, while the relative independence of the Jamaican government and his new and untested relationship with Dancer made the Bath garden less suitable for his purpose.[8]

The reception of breadfruit highlights the lack of interest the House of Assembly and the planters had for botany. Even though they had requested this transplantation and had created a committee for the reception of the shipment, they were ill-prepared for Bligh's coming and the situation almost turned to a debacle if it had not been for the quick thinking of the captain, Dancer and the estate of the late Hinton East. After their stop at St Vincent, the *Providence* and the *Assistant* went to Port Royal, a small harbour town neighbouring Kingston, to make their first Jamaican deposit. The House of Assembly was embarrassed when they realize they had no means to transport the rest of the cargo to the other drop points, but Bligh volunteered his two ships. He went personally with the *Providence* to Port Morant for the principal depot at Bath and for the county of Surrey, while the *Assistant* went to Port-Henderson and Savanna-La-Mar. They also realized that the principal depot was too big for the Bath garden, but the heir of Hinton East proposed to house the excess in his Liguanea garden, as it had originally been planned for the first breadfruit expedition.[9] Dancer built a small nursery adjoining the Bath garden to accommodate the plants he could not put inside the garden, which would be under the care of James Wiles, the primary gardener on board the *Providence*. Banks had personally selected Wiles for the complicated task of taking care of the breadfruits while they were crossing the globe, thus he had recommended the House of Assembly to employ him to oversee the continuous growth of the plant on the island and to teach the planters how to successfully transplant it. Eventually, the plants of this small nursery and James Wiles would be displaced inside the Liguanea garden after its purchase by the House of Assembly, which came with thirty-nine slaves.[10] Breadfruit had been successfully transplanted and would be ready for widespread distribution in the coming years. This victorious turn of

events seemed to have created a certain infatuation for botany in Jamaica which spurned the House of Assembly into the support of botany. It put the committee for the reception of South Sea plants in charge of the continuation of the project. This committee could have very well transformed itself into the supporting institution science needed in Jamaica, and it promoted the search for new plants to bring to Jamaica, but the lack of results from this search and the deterioration of the relationship between Dancer and the House would bring this interest to an end.[11]

The most telling element of this degeneration is the different tone in the relationship between Dancer and the House and James Wiles and the House. The garden at Liguanea continued to focus on breadfruit production and transplantation, while the Bath garden kept its mission of finding new plants for Jamaica while also giving plant specimens to planters.[12] In 1797, it was reported that Wiles had distributed two thousand fifty-nine plants, and that the garden was now so flourishing that it could send any number of plants within one month's notice. Two years later, the garden was so flourishing that only six slaves were required to take care of it, the rest could work on a small coffee plantation adjacent to the garden which could cover the cost of running the garden, an expense that had bothered the House.[13] The plant distribution of Bath was less impressive, not only because it was not its primary mission, but because Dancer had to leave the garden for prolonged periods of times, which led it to a state of disuse. In 1795, he fell ill and had to leave for England to receive care, but we know he was back in Jamaica by 1797 because he was officially appointed Island Botanist. In a report to the House of Assembly in 1801, Dancer said that he had distributed several plants including breadfruit, Tahiti plum, cinnamon and ackee, to twenty-two individuals, but he revealed that he had left the garden for two years to practise

medicine in Kingston, replacing his friend Dr. Grant who had retired to England. Although he had not been living in Bath for the past two years, he swore that he had not neglected his duty and that he prayed for relief, that is that the House of Assembly would increase his salary so that he could dedicate himself only to the garden. James Wiles was in a similar situation, the coffee plantation was now taking most of his time, and he asked the House of Assembly if they could hire a third gardener to help him and Dancer. The members accepted and asked him to demand that Joseph Banks select the proper person to send to Jamaica. It is not known how Banks responded, but no new hire was made. Dancer relinquished his post as Island Botanist due to the lack of support.[14]

The situation came to a head in 1804. Dancer published a small tract named *Some Observations Respecting the Botanical Garden*, an appeal to the House of Assembly for more attention to the state of the garden. He wrote that the public garden had been of great help to the island by bringing plants such as cinnamon, black pepper and cardamom, but now the two public gardens were in a state of disuse. He proposed to either close the Bath garden or move it to the mountains to focus on cold climate plants; the island botanist could either be him or James Wiles, for whom he had a lot of respect.[15] A week after the presentation of the pamphlet, the House of Assembly created a committee to evaluate Dancer's proposition. The conclusions of the committee went the way of Dancer's recommendation, but the members of the House decided to keep the two gardens with the two gardeners. This displeased Dancer, but he accepted their offer of an annual salary of two hundred pounds and he was reinstated as Island Botanist, this time keeping the title until his death.[16] After this confrontation, the House of Assembly lost its interest in botanical science, they had gotten what they wanted with breadfruit, but now pursuing such

endeavours only brought expenses and problems. They sold the Liguanea garden in 1810 because of the rising costs and the depletion of the coffee plantation's soil.[17] Dancer continued to try to bring new plants to the garden, but the passion that had animated him a decade earlier had vanished, he had discovered that botany did not interest the parties best apt at helping him to bring new food staples or medicinal plants. He had already started to turn his attention towards medicine, he had published *The Medical Assistant* in 1801, and due to its popularity, he was working on a second edition. This would now be the way in which he could promote the West Indian diet.

Other factors need to be considered to explain why botanical science failed to create a long-lasting interest after the arrival of breadfruit. First off is the lack of interest about the other useful plants. Aside from the sixty-six breadfruits, the Bath garden received thirty different plants represented by one hundred twenty-seven different specimens. Although they would be too numerous to all list, the most remarkable were: Cocoa nuts, almond, peach, pomegranates and other fruits; the carambee, used as a perfume in Malaysia; the mattee and ettow, which could be used to create red dyes.[18] Although this was an impressive addition to the Bath garden, it was not exactly what Dancer had hoped for. In a letter sent to Samuel More on July 20, 1794, he wrote: "Of the various trees & other plants brought here by the *Providence* from the South Seas, there are none in my opinion that promise to be of any value or consequence except the Breadfruit which grows most vigorously when planted in a proper situation."[19] This lack of interest on the part of the Island Botanist illustrates the deception that was felt towards the South Sea plants after the potential to bring a new staple was absent. It seems that it would require more hard work to bring an important staple like breadfruit or sugar cane.

The failure to find anything that could compare to breadfruit did not help to foster a continued interest either. After the reception of breadfruit, Dancer had four botanical items on his mind. The first one was cinnamon, which he had continued pursuing since his presentation in front of the Society of Arts, continuing his experiments on the Jamaican brand to see if he could make it into a durable Jamaican staple. He wrote to Banks on July 15, 1793, that he had produced six pounds of cinnamon from a small tree with a new process and hoped to find a way to preserve it in brandy from a recipe by Samuel More.[20] In the same letter where he states that breadfruit is the only useful plant from Bligh's voyage, he also describes Jamaican cinnamon as superior to the Ceylon one, and that it should be pursued as an economic staple, but this was never done. The second plant was black pepper, a sought-after plant from the French and Dutch Asian colonies. The English had almost got their hands on it when Admiral Rodney captured the ship that jump-started the collection at Bath, but the sailors on board had been able to burn it before their capture. Dancer asked for black pepper from his many connections, and so did Wiles who had a better relationship with Banks, but to no avail. The two other items were nutmeg and clove trees. Both Dancer and Wiles had asked through their connections to receive samples of them. Banks had been able to give samples of nutmeg to Wiles, but they had arrived in bad shape and died soon after. They had also been able to get samples of clove trees from St-Domingue, but again the state in which they arrived was poor and they could not be effectively transplanted.[21] The lack of results on these fronts certainly made it look to the House of Assembly like it was not feasible to gain new plants without the help of someone like Banks, who preferred working with the St. Vincent garden. Finding plants required both luck and knowledge, most of the important plants on the island had been transplanted

through accident or without the full knowledge of their potential, the only one that had been transplanted with a clear intent before breadfruit was sugar cane.[22]

Thomas Dancer's botanical failure is not only due to the lack of funding from the House of Assembly, but also because he was not able to properly maintain the correspondences that would have enabled him to pursue new projects after the completion of the breadfruit experiment. To develop a botanical correspondence, one needed to gain the interest and respect of another botanist. Dancer had been able to do so with William Forsyth, Edward Long and the Society for the Encouragement of the Arts because he could procure them tropical plants and he had a concrete project for agricultural amelioration. Long had then put him into contact with Joseph Banks, who found in Dancer a Jamaican botanist who shared his will to improve the empire through botany. To maintain a botanical correspondence, one needed to treat his correspondent with respect and be able to send interesting specimens in a timely fashion. Dancer had difficulties in sending properly packaged plants that could survive the Atlantic trip, if he could send them at all, which caused problems with his correspondences and even lost some of them, like Banks. This inability to answer the demands of his correspondents was due to multiple factors, some of his own fault, while others were out of his control, like the fact that he had to go back to medicine to sustain himself. The resultant alienation did not lead to Dancer's isolation, since he was able to continuously correspond with many botanists throughout the empire, but it lost him the confidence that Banks and others had put into him, and Banks started to prefer James Wiles has his main correspondent in Jamaica rather than Dancer, lessening his chances of obtaining an important specimen.

In a letter to Banks dated November 22, 1792, two months before Bligh's coming, Dancer apologized for the state in which a previous package sent by him had arrived, the plants were all dead. He took part of the blame on himself, but also put it on misfortune and the mishandling of the ship's captain. Transferring plants between oceans was a difficult task to accomplish. The plants and seeds needed to be properly packaged or potted, otherwise humidity would make them rot and the salt in the air would poison them. The sailors had to properly take care of them, making sure they had enough sun and water to survive the journey. They could also be damaged during storms or while being transported.[23] Thus, blaming the captain might not have been wrong, but it still was a failure on Dancer's part not to have made sure that his plants were in good hands.[24] He concluded this letter by sending a catalogue detailing another package that would be sent shortly.[25] In a subsequent letter dated January 10, 1793, Dancer informed Banks that the House of Assembly had voted a budget of £250 for him to make a collection for Kew gardens, which would accompany another collection made by Dr. Arthur Broughton. Both collections would return by Bligh's ship to England.[26] This was certainly the chance for Dancer to make a durable impression on Banks by creating a collection that would show all the potential hidden in the Bath botanical garden.

When Bligh anchored at Port-Morant, he had arrived sooner than expected, which had caught Dancer off-guard, the collection was not ready. In a letter to Banks dated March 28, 1793, Dancer wrote that he did not have the time he had wished for to create a collection that would have given a full view of the flora of Jamaica and the contents of the Bath gardens. Dancer's excuses did not gain him any sympathy on the part of Bligh, who had written in an entry log of his personal journal dated February 13, 1793, that no plants had

yet been collected for his Majesty's Garden at Kew.[27] Luck was on the side of Dancer though, it was decided that the *Providence* and *Assistant* departure on April 2nd were to be delayed so that the ship would not sail during winter. When the climate was right for the departure of the two ships, the Jamaican government received news that war had erupted between England and France following Louis XIV's execution, grounding them further.[28] Dancer was very happy for these delays, and he wrote on April 3rd to Banks that this would allow him the time to complete the collection, and he inserted a list of the plants he intended to add to it. But on June 5th, Dancer wrote that due to bad weather and his own sickness he had not been able to add to the collection, and it would sail as is. Bligh was ordered to sail on June 10th, and he arrived in on September 6, having finally accomplished his quest after four years.[29]

The debacle of the Jamaican collection reflected poorly on Dancer. Not only once, but twice had he failed to complete his collection. Bligh's coming to Jamaica had been a unique chance to deliver a collection of a size that could not be equalled by any other shipment, it could have encapsulated everything that Jamaica had to offer. Still, the collection that was sent to Kew included nearly one thousand specimens, an impressive addition nonetheless. When one compares the collection made by Dancer to the one made by Broughton, it is easy to see that the latter had dedicated more time to create his own. Arthur Broughton's collection was much more numerous, having nearly three times the size of Dancer's, but he had included two samples of each plant to ensure that the maximum number of specimens would reach Kew. The reason why Broughton's part of the collection was more complete might simply be that he had prepared in advance for the arrival of Bligh, unlike Dancer. The plants he had chosen were of a wider variety, but he did not necessarily

share Dancer's mission to introduce new food and economic staples on the island.[30] Although the choices of Dancer demonstrated a lot of variety, ornamental plants had been expunged from the list, the collection was meant to highlight the possibility of economic growth in Jamaica through botany.[31] In what might be a gesture to compensate for his failure, Dancer sent a smaller shipment of plants by commercial ship to Banks on July 15, hoping it would demonstrate his good will.[32]

Banks was not the only correspondent of Dancer to suffer from his inability to send plants, two of his most important correspondents, William Forsyth and Samuel More, also had difficulty getting specimens from him. In 1790, Dancer mentioned in a letter to More that he had sent a box of plants, but due to a mistake, it was not put on board the ship and all the plants had died in the box.[33] In 1793, Dancer was informed by Forsyth that a package he had sent in 1792 had arrived in bad shape, most of the plants being dead. This time Dancer took the blame on himself, saying that he had not properly packaged them. In another letter dated February 1, 1796, Dancer excuses himself because Forsyth had been disappointed in the plants he had lately received on his part.[34] This lack of ability to be able to fulfill the request of his correspondents gave him of a bad reputation. Sending plants to him did not necessarily mean that you would get some back, which did not encourage other botanists to follow through with his letters.

Another problem with Dancer's letters was his insistence that correspondents send him seeds or plant specimens and relay packages to his other correspondents, even as he was not able to reciprocate. Dancer had sent a collection to Forsyth in 1788, but half of it had been intended for James Lee, gardener at the Vineyard nursery in Hammersmith. Sending shipments of plants was costly, and Dancer could not afford to send too many in

the same year, thus it is normal that he wanted to maximize each package.[35] It became a problem when he wanted to use the place aboard the *Providence* and *Assistant* to send plants to Forsyth and a Mr. Molesworth of the pay office. This was badly received, Dancer was told that the places on board the two ships were not intended for his friends, but for the Royal Botanical Garden at Kew. Jamaican historian Bryan Edwards wrote a letter Banks saying that he could tell him to stop writing to him. Banks was gracious enough to continue the correspondence and even let Dancer put the plants he had intended for his two correspondents on board the ships.[36] Years later, he would solicit seeds from Forsyth even though he had not contacted him for some time and he had not been able to send him proper specimens himself.[37] Dancer was not able to show proper respect to his correspondents. From their standpoint, it might seem as if Dancer did not care enough to make time to create and properly package a collection for them, instead he was only interested in enlarging his circle of botanical friends to acquire more plants for his garden. Although it is true that this was his goal, Dancer was well intended when he exchanged plants, his enthusiasm shows that he genuinely wanted to be a part of the movement of botanical interest that had sparked in the late eighteenth century. This enthusiasm though was not always well received when he inundated them with letters demanding seeds and plants. The botanical project of Dancer ended of his own fault as well as the House of Assembly, while the lack of interest in botany in Jamaica left very little support for himself and the garden, but there were other ways to improve the diet of Jamaicans.

Dr. Dancer had practised medicine in Jamaica for twenty-eight years in Kingston, Spanish Town and Bath, he had healed colonists, slaves and soldiers alike; *The Medical Assistant*, his final book, was a summary of all the knowledge he had gained throughout

these years, and it answered a crucial problem on the island. He wrote in the preface: "Where medical assistance is not at hand, or cannot be afforded, which is not unfrequently the case, something must be done for the relief of pain, and the prevention of danger. A suffering mortal is not to be abandoned, or consigned to misery and death, without any attempts being made by those about him, for affording him relief, because they happen not to be medical men, or have not had opportunities of studying physic regularly. Such a knowledge of diseases, and their treatment, as will enable a man to be, on many occasions, useful to himself and others, may certainly be acquired without a regular and scientific course of study. A book, therefore, like the present one, that may serve as a guide to persons in this situation; that, besides giving general notices concerning health and disease, teaches, in a plain and familiar manner, how to distinguish and treat the prevalent diseases of the climate, it is presumed, cannot but prove useful and acceptable, particularly considering that there is no preceding work of the kind."[38] Dancer's instructions were simple yet complete, and in the annexes he gave a full list of the medical plants of Jamaica and how to use them to make remedies. He also included the healing effects of Jamaican food, and in the introduction, he gave a guide for a healthy diet in the West Indies. This section offers us the complete West Indian diet and the reasons why its adoption was recommended for those who wanted to live a long life in the British Caribbean.

Dr. Dancer started the section on food by stating that: "This subject is one of the most important that comes under our consideration: it is in the errors and excesses we are guilty of in our manner of living, that a great part of our diseases originates; it is also, by a proper regimen and diet only, that we can get the better of many of the most obstinate complaints."[39] He continued by writing that humans are instinctively inclined to eat meat

in cold climates and vegetables in hot climates, but that due to habits, settlers continued to follow their European diet which led them to make bad decisions concerning their choice of food staples and to eat excessively. On the other hand, if the right choices were made, it seemed that a good diet was the most effective cure against many health problems and could also successfully prevent one from falling sick. This statement demonstrated how food had become an important preventive measure in the West Indian environment. Although Dancer did not abandon medical cures since most of the book concerned their confection and proper usage, the emphasis he had put on proper eating suggests that he thought of food as the best way to survive the dangerous tropical environment because of its dual properties as both a cure and a preventive measure. Dancer's intended readers had limited access to medical resources and no medical knowledge to speak of, thus it would have been easier for them to properly balance their diet to keep themselves in good health rather than try to cure digestive problems, or worse.

Dancer did not give precise instructions on the quantity of food one should eat daily because it depended on one's age and constitution, but he stated that people tended to eat too much in Jamaica, which should be avoided because it created digestive problems. He recommended a vegetarian diet only to women, children and the old because they had a more sanguine temperament, which was worsened by the consumption of meat. He also wrote that cooking was not necessary for proper eating, but it made the food more digestible and tastier. Excess seemed to have been an important part of the problem with West Indian diet, as he even recommended not to drink too much water. Although water was the "natural drink of man" and could be drunk without any problems unlike wines and spirits,

too much water could potentially be problematic. He also recommended wine because it helped against epidemic infections, but without getting drunk.[40]

Meat was still the most nutritious and easiest food to digest, without any differences between poultry, bovine, pork or mutton meat. The problem with the consumption of meat in a tropical environment was that as it went through the digestive process, it created heat in the stomach and intestines. In a temperate climate this would be helpful, but in a tropical climate, this internal heat creation combined with the outside hot air to create an overheating of the body which greatly upset the humoral balance and left it defenseless against miasmas. The older the meat, the more heat it would create, while younger meat and gelatinous flesh like eggs and fish were better, but still problematic. To regulate their temperature, Jamaicans needed to lessen their meat consumption and balance their diet with more vegetables. Only the laborious, those with a cold constitution or with weak digestive organs could eat meat in a more regular fashion.[41]

Vegetables were more complex to approach than meat. It was believed that they were harder to digest and less nourishing than meat, but farinaceous and oily fruits were close enough to meat to enable substitution. Pot herbs and salads were only good at giving digestive problems since they had very little nutritional qualities and the air inside of them filled the bowels, an issue that could be even worse with those who had lived in a warm climate for some time. The watery, saccharine and "subacid" fruits were eaten more for pleasure than nourishment, but they were necessary as antiseptics and could lessen the problems associated with eating putrid meat. Since the study of James Lind, doctors had come to realize the importance of lemon to fight off scurvy and other malnutrition-based diseases, and this conclusion had been extended to fruits in general, thus they were

perceived more as a medical cure than food. Fruits also had the benefit to cure the effects of eating putrid meat, a process that happened quickly under the hot Jamaican sun. Dancer did not make clear how fruits "corrected" putrid meat, but we suggest here that it was observed that when ingesting fruits after eating putrid meat the digestive problems were lessened. Dancer stated that the West Indies offered more fruits that could be classified as "real food" such as plantain, breadfruit, avocado, chocolate and others. These fruits were a perfect solution to the heating problem of meat consumption as they would feed the colonists and slaves in a similar manner but without the creation of heat. The concept of nourishment presented by Dancer is an example of how doctors understood the mechanics of nutrition. It seemed that nourishment was closely associated with the sense of replenishment when one felt full after a meal. Meat created this feeling quickly, while fruits did less so. Only the food mentioned earlier as "real food," which had a greater protein and calorie content, created a similar feeling. According to Dancer, only those fruits were worth consuming when one wanted to nourish himself, thus food was conceptualized only on the terms of this sense of filling the stomach.[42]

An important element of the nutritional paradigm of the time was its basis on a hierarchy of transformation of the basic elements of nature, going from the environment to plants to animals to achieve a form complex enough for the most advanced being of all, humans.[43] This hierarchy stemmed from observation of natural relationships, but it also was deeply influenced by the theological hierarchy of the world. Compared to medical science, the nutritional paradigm was more fluid and evolved quickly with the introduction of new elements, thus it is hard to know if there was a consensus on a given theory, but one of the most detailed books on the subject is *A Treatise on The Digestion of Food* by Scottish

physician George Fordyce. To explain how digestion works, Fordyce broke down what animal and vegetable matter are, and how they are transformed as they go from one living being to another. His theory stated that all animal and vegetable matter (solid or fluid) is made of water and mucilage, the latter element being a class of substance.[44] Mucilage can be isolated from water through distillation, which left an inflammable substance, and then its properties could be further analyzed.

In vegetables, Fordyce identified several elements that could procure nourishment. The first one was what he called farinaceous matter, which could be found mostly in the seeds of graminids. Farinaceous matter was the principal feeding source of mankind, because humans ate graminids, but also the animals they fed on, found their principal source of nourishment there. Farinaceous matter was the same in all vegetables, but certain elements of its composition was present in higher amounts in certain plants. Starch was found in farinaceous matter and it was very nourishing, thus plants such as breadfruit and potatoes, which contained a lot of starch, would be better at feeding large populations. Sugar was also a substance fit for human nourishment, and it could be found in every plant, but only a few plants procured nourishment through sugar, such as grapes, dates and figs. Fordyce also noted that the gum produced by certain vegetables can be consumed for food, but only in case of necessity as it was not as good as sugar or farinaceous matter. There existed other plant mucilage that could be used for fermentation as well as other elements that could be digested but procured no real nourishment, passing harmlessly through the system.[45]

Animal matter was made of water and mucilage, but in this case, the mucilage was not as easy to separate and analyze than with plant matter. Fordyce had identified that the

mucilage rested mostly in the fibrous and cartilaginous parts of the animals, such as muscles and organs. Blood was the second source of nourishment, and even poisons could be digested, but bones were like stone and provided no nourishment. The mucilage ingested, either from vegetables or animals, was then transformed into blood and chyle by the digestive process.[46] Just like Dancer, Fordyce essentialized food to only a few elements. Starch and sugar were important because they provided the kind of nourishment that gave a lot of energy and thus a sense of fullness at the end of the meal. Anything that did not give this sense of filling the stomach was not real food, so fruits and vegetables like salads were put aside as useful only for the palate.

What is interesting with Fordyce's idea of nutrition is that it organized nature through digestive ability, which ultimately led to a justification for colonization. The hierarchy that Fordyce presented went from air to plants to animals to humans. Plants fed themselves from the water and vapours in the surrounding air, soil was only a support while light was helpful, but not necessary.[47] Herbivorous animals would then eat those plants to consume their mucilage, while carnivorous animals would eat them, thus they were also sustained by plant mucilage.[48] Fordyce stated that each animal had a natural food, and there existed at least one vegetable or animal for each animal. This is where humans were different from the rest of the animal kingdom, because humans had the capacity to feed upon anything they encountered: "I am not, therefore, to enquire what is the natural food of man, who has no natural food; but into what he has been able to render proper for his nourishment, and been able to produce for himself by his own industry."[49] If they could not readily eat the plants or animals of a new environment, then humans could transform them to make their flesh suitable for consumption. He took for example graminids, which

had been modified by human work to create larger seeds to feed more cattle and people.[50] This enabled humans to colonize every environment: " … but man is destined to inherit the whole earth; not according to Ovid and some of the other ancient poets, to live only in the temperate zones, but to live and even be numerous in the torrid and both the frigid zones."[51] This ability to adapt and transform was not only confirmed by the colonization that had happened before, it also came from biblical scripture: "Little men, and forgetful of the Almighty's decree, that man shall earn his bread by the sweat of his brow, and of course find out all kinds of substances form whence he is to procure subsistence; and if he cannot by his industry find out vegetables, or animals which may serve him for subsistence, he must cultivate and alter them from their natural state."[52] Fordyce thus declared that humans were meant to inhabit every environment because they could consume everything they had to offer, while animals and plants could not be so easily displaced, which confined them to specific geographic zones.

To write *The Medical Assistant*, Dancer based the content on his own observations, but also on the work of other West Indian doctors. The British West Indies had developed a strong medical community, as was already demonstrated by the earlier discussion on soldiers' health, but this also extended to treatments given to the civilian population of Jamaica and the other British tropical islands. Dancer had many friends in this medical community, and a few enemies, and in *The Medical Assistant* he engages the works of both. He makes references to plenty of books, but he identifies a few of them as experts on the health issues faced on each island. Although these books were written for a medically literate audience unlike Dancer's book, their dietetic guides are an interesting opportunity to see how concept of the West Indian diet evolved outside of Jamaica. The debate

illustrated helps us to better understand how nutrition was conceptualized, and how indigenous staples could be appreciated, or disliked, for the adaptation they created inside the body.

The doctor mentioned for St-Domingue by Dancer is Dr. Hector McLean, who accompanied the British troops during their occupation of the island and subsequently wrote a book called *An enquiry into the nature, and causes of the great mortality among the troops at St. Domingo*, released in 1797.[53] Like many tropical doctors, McLean prescribed moderation in eating; too much meat can overload the digestive system, while fruits and vegetables are harder to digest and do not give enough energy. The doctor is mostly concerned with drinking though. He stated that rum is too coarse and made with bad water, but alcohol is an important part of the diet, thus one should replace it with Madeira or port wine. The quantities he prescribed for alcohol are quite generous compared to others, but he claimed that moderation is to be followed in the tropics because alcohol created mild heating in the system. One should not consume hot water, like tea for instance, as it created too much heat in the body; cool water should accompany every meal, with alcohol following to help digestion.[54] As mentioned in the first chapter, the importance of water was well-known, but the benefits and damages of alcohol less so. Doctors were certainly lenient with their patients about the drinking of alcohol as it was a widespread, if not universal, habit to drink, but the accounts of the biological effects of alcohol vary widely, from dangerous to medical cures. The strength of the alcohol certainly had a role to play in deciding if an alcohol was good or not, but it seems that prejudices played a role as well, as European drinks are always considered better than indigenous drinks.

Colin Chisholm was a British physician and medical writer who served with the 71st regiment during the American Revolution, and at the end of the war in 1783, he moved to Grenada where he practised medicine as well as owning a plantation.[55] His most well-known publication is *An essay on the malignant pestilential fever introduced into the West India islands from Boullam, on the coast of Guinea, as it appeared in 1793 and 1794* published in 1795. The guidelines he gave are intended to be used during fever season, that is when yellow fever affected people in greater number during the mosquitoes' breeding season. He counselled temperance when eating and to avoid strong liquors and meat if not to abandon them completely when fevers swept the country. He stated that this was because nitrogen was in the fibres of the meat while wine was made of hydro-carbonate, elements that were to be found in the noxious miasmas that were the sources of the disease, thus by eating meat and drinking wine one would open the door of his body to miasmas. He also claimed that French people in Grenada are healthier because they ate more vegetables and drank acidic red wine, which seemed to be different than the one that he prescribed.[56] For Dr. Chisholm as well as Dr. McLean, diet was of great importance during this fever season, one needed to keep his body clean and in full strength, but it is interesting to see how they differed on this regard. McLean still preferred meat to vegetables because it gave more strength, but Chisholm prescribed a vegetarian diet, which would weaken the body, but it eliminated the intake of noxious elements.

Dr. James Clark practised in the island of Dominica for many years and published multiple books and articles in medical journals during his career.[57] In his treatise on yellow fever in 1797, he wholeheartedly embraced the vegetables and fruits of the island, a stark contrast to his peers. He stated that when Europeans arrived in the tropics, they should only

eat vegetables to acclimatize to their new environment, and when there is an epidemic of yellow fever, meat should again be abandoned in favour of vegetables to eliminate overheating the digestive tract.[58] Clark also published an article on the starch content of comestible roots in the West Indies. Starch, which Clark called amylaceous matter, was to be found in great quantity in certain West Indian staples like arrowroot, sweet and bitter cassava and yams, but he observed that depending on the quantity present, it had different properties. Arrowroot, with little starch, was mostly helpful as medicine for digestive problems. Bitter cassava, with a lot of starch, and when drained of its poisonous juice, could be made into a flour-like powder to make bread or cakes; sweet cassava was seldom used because it grew too slowly, and it could lead to mistakes with the bitter one.[59] These staples also separated Europeans and Africans. A species of yam called couch-couch was a very delicate food when roasted or boiled, but it was only eaten by Europeans, while another root called the eddoe could be made into a very nourishing soup for the slaves. It is interesting to see how starch came to be one of the most important elements pertaining to nutrition, so much so that it helped the reputation of indigenous foods like the root vegetables of the West Indies. Its properties were not well understood yet, thus doctors tended to give it more beneficial effects than required, like the ability of arrowroot starch to cure digestive problems.[60]

Regarding the French colony of Martinique, which was under the control of the British Empire during the publication of *The Medical Assistant*, Dancer mentioned the name of Dr. Leonard Gillespie who was the physician aboard the British ship *The Majestic* and served in the military hospital from 1794 to 1796. Gillespie's writings are interesting only pertaining to disease aboard ships, of which we have already discussed, but a French

doctor by the name of A. M. T. Savarésy used Gillespie's book as a source to help in his own book on yellow fever in Martinique, and he discussed the diet that should be adopted in the West Indies, giving us a glimpse into what the French thought about food in the tropics. His book, *De la Fièvre jaune en général ; et particulièrement de celle qui a régné à la Martinique en l'an xi. et xii. (1803 et 1804) ; avec des observations sur les autres maladies de cette île ou des Antilles, et un essai sur son histoire naturelle*, was published in 1809 and like many other books on medical issues, it mainly concerned soldiers, but when he referred to the civilian population, he prescribed the same diet with some additions. Just like British doctors, Savarézy explained that the Europeans encountered medical problems as soon as they entered the Caribbean environment, and they should change their diet accordingly, describing the same process of seasoning discussed by Benjamin Moseley. Like Dancer, Savarézy stated that Europeans should eat less and drink more water, because liquors created heat in the body. The French doctor noted though that there are two problems with food in the West Indies. Because the colonists ate staples that are imported from all over the world, they have started to spoil when they arrived, which leads to poisoning. The other problem is that food indigenous from Martinique is not very good, he writes: "Les aliments indigènes, tires de la Martinique même (sans parler des animaux à sang chaud), et spécialement les végétaux, sont laxatifs, venteux et un peu indigestes… Les animaux à sang chaud ont la chair plus gélatineuse et moins riche en sucs nutritifs, que celle des animaux d'Europe : les poissons tiennent le milieu entre les animaux à sang chaud et les végétaux, par rapport à la nutrition."[61] Still, he recommended farinaceous vegetables like potatoes, manioc and bananas with some country fruits, while for meat he recommended beef and mutton in little quantity, or fish because it created less heat in the

stomach.[62] Savarézy's diet is very similar to Dancer's to eliminate the problem of overheating, the primary concern of the West Indian diet promoted by the British tropical doctors. In contrast, he disliked the use of Caribbean staples, they were inferior to European food, but they were a necessity, taking an even stronger stance on this issue than Dr. McLean. Dancer's agreeable sentiment towards Caribbean food might be because he stayed there for many more years than Savarézy, who travelled a lot and did not stay for long in any one place.[63] It is interesting to note also that Savarézy seemed to conceptualize digestion in a similar manner to Fordyce, he prescribed farinaceous matter because it is more nourishing, but he mentioned sugars in meat, which is not something that Fordyce does, although the Scottish physician did not develop on the constitution of the mucilage in animal meat, thus it is possible that French physicians thought that sugar was the primary nutritional element of meat, similar to plants.

Little is known about the nutritional paradigm in the colonial era. This problem stems from the recent interest in food science, but also because nutritional science before the nineteenth century was mostly based upon conjectures and hypotheses, there was little consensus about what "nutrition" meant, thus it is hard to create a history of such a loosely based concept.[64] Mucilage was certainly a core element of the source of nutrition in all things edible, as well as the gelatinous elements in meat and the chemical transformation that would happen inside plants and animals to then be consumable for humans.[65] With the present discussion on the West Indian diet, we have seen that food played an important role in the health of colonial society, but we have also been able to identify three new elements that enable us to better define the nutritional paradigm of this period.

What was agreed upon was that food was to be considered under the factor of nourishment, that is giving energy and filling the body. Thus, nutritional experts divided food in two broad categories, real food that provided sustainment, and pleasurable food that was only eaten because of its taste. In this respect, meat was the most nutritious food of all, followed by starchy vegetables and dairy products. Pleasurable foods were fruits and vegetables like salads, from which one would not derive much nutrition, but they had medical properties that made them useful enough to be included when presenting a full dietetic guide. Meat was also easier to digest than fruits because it contained less air, but their digestion created heat, and this was the start of the difference between the European diet and the West Indian one. From this, we can deduce that the process of digestion, and what made a food easier to digest, was deduced from the sensation it had in the stomach and intestines. This sensory perception also extended to nourishment, as it is how one knows when he is full. Thus, internal sensory perceptions played a crucial role in defining nutrition. This sensory-based nutrition explains many of the shortcomings of European diet, because the benefits of fruits and vegetables come from their vitamin content rather than proteins and calories.

What we can also conclude from the process of seasoning and the mitigated opinions on eating indigenous staples from the West Indies is that food was thought to have a profound biological effect on the human constitution. This process of seasoning was a subject of study for naturalists who were interested in climate studies as well as to find the best way in which one could move humans, animals and vegetables form one environment to the other. Banks and the Horticultural Society had been trying to prepare plants for transportation around the empire, creating new economic and dietetic staples and help

animal acclimatization.[66] In our case, this process would extend to humans, because doctors and naturalists seemed to think that plants would transfer their environmental characteristics after consumption. By eating indigenous products, Europeans and Africans would acclimatize their body to the environment of the West Indies. By adopting these new staples, they would eventually transform themselves from Europeans or Africans to West Indians, their humours and bodily fibres would permanently become attuned to the tropical environment. This explains why some doctors were reluctant in adopting indigenous staples, because they did not want to transform into what could be considered a being of lesser constitution. It also explains why some doctors like Dancer believed that it was dangerous for someone who had stayed for more than a decade in the Caribbean to go back to the colder climate of Europe, their body had irremediably changed and would no longer survive there. The process of seasoning aboard ships was different though, because they had not yet access to Caribbean staples, but it seemed that simply eating more vegetables and less meat began a slight biological change. The reason for this change is not explicitly written in the material presented, but we can suppose that the cooling effect of a vegetarian diet was more permanent after some time.

Thus, to summarize the West Indian diet, it was more vegetarian than carnivorous because of the digestive and health problems caused by meat eating, while the vegetables and fruits would protect Europeans against malaria and yellow fever. West Indian diet also avoided the problem of provisioning food from sources outside the Caribbean. A lot of the elements that constituted the European diet could not be easily accessed in the West Indies, they had to be imported which made them costlier, and they spoiled quickly, which furthered health problems.[67] The animals that could procure meat were not as abundant in

Jamaica as in Europe, thus fresh meat was less accessible, but fish was very plentiful. Jamaica and the rest of the British West Indies had plenty of nutritious fruits and vegetables to offer, and combined with fish eating, it would have helped acclimatize, or seasoned, immigrants to the tropical climate. The balance between meat and vegetables was different depending on the book read because doctors' opinion diverged on the importance of keeping one's strength versus avoiding internal heating. Climate, health and food were all intricately tied to each other in the medicine of the eighteenth century, and the failure of medicine had pushed doctors like Dancer to promote a healthier style of living as a preventive measure against a deadly environment because it could have a direct impact on the well-being of the Jamaican population. Dancer's book encountered great success and saw two other editions being printed, one in 1809 and one in 1819 after his death. It had reached the goal he had intended, it was used by Jamaican families for decades, even into the twentieth century.[68]

One last question remains to be answered: did the West Indian diet include slaves in its recommendations? And what is the place of breadfruit in it? In Dancer's case, his book was intended to be used by families and plantations, thus we can deduce that his dietetic recommendations were meant for enslaved Africans as well. The problem with the diet of the slaves is that they did not have complete control over it, the plantation managers played an important role in its content and abundance as well. This highlights the problem of assessing the role of doctors in the constitution of the slaves' diet. We have already discussed in the first chapter the sources of food for the slaves and how it was barely enough for them to survive, let alone work at the extreme rate at which they did. What these historical studies have shown though is that the masters did not see any problems

with the slaves' allotments, they believed instead that plantain, cassava and yams were plentiful staples that produced an excellent nutritional base, and this belief was held by them even after the hurricanes and the American Revolution had shown the fragility of this system. William Beckford wrote that the slaves had everything they needed in their provision ground, and he even made a case against breadfruit, stating that plantain was more nutritious.[69] He also stated that the size and success of a provision ground depended on the slave who had it under his care, a widely held belief, but the genesis and evolution of this system contradict this statement.

The provision ground system had been conceived as the best solution to feed the constantly increasing slaves' population while keeping the cost of feeding them as low as possible. The slaves would work to procure their own food, which they believed would give them a sense of accomplishment and freedom while creating an incentive for a production of quality and quantity.[70] What could not be produced on the provision grounds would be given by the masters to complete their diet, but the system did not evolve or adapt to the changing times. At first, provision grounds were situated close to the slaves' houses, but as the population of the plantation grew, they would get further away from their home, going from a few miles up to thirty-five,[71] a long walk after a full day of work, but the masters generally gave a free day on Sunday to enable the slaves to work on them. If one considers the fact that they were very tired, that meteorological events could damage their plantation and that crops would not always yield the maximum amount they could, then it is no surprise that the slaves could not feed themselves properly with their provision grounds. What is interesting though is that even if the ideal level of production and allotment were met, Kenneth Kiple calculated that this would still not have sufficed, the

slaves' diet was structurally deficient from the beginning.[72] A conclusion that we can make of this system is that the relation between high-level of work and increased nutritional needs was poorly understood. It is hard to know if plantation doctors had started to realize this because there is a lack of discussion on the issue of the slaves' diet in the West Indian medical community.

Most tropical medical books were concerned with health of soldiers or settlers, and the few books that discussed the slaves' healthcare were focused on the treatment of disease; there is very little to no information on their diet, but more attention is given to their clothing and habitation. From this, we can deduce that doctors thought that there was no problem with the slaves' nutrition, or that they felt that it was a lost cause to discuss this issue. It is important to understand that although doctors were an important voice in Jamaica as it pertained to the treatment of the slaves, any guideline that would go against the profit of the planters was not welcomed, there are many instances when a plantation manager disregarded the counsel of a doctor pertaining to the state of a slave or preferred to let their slaves die rather than pay a doctor.[73] The West Indian diet presented in *The Medical Assistant* could have very well been applied to the slaves because it is based on vegetables rather than meat, and the book was addressed to plantation managers. We cannot assume that this is the case because in his recommendations he did not mention how it could be possible to counter the restrictions imposed on the slaves' diet, and the rest of his recommendations for a healthy lifestyle is certainly directed towards the free population.

Only a few doctors have discussed this issue in some extent. Dr. Robert Collins gave an extensive account and list of recommendations on the diet of slaves. Collins agreed with the provision ground system as being the best method to feed the slaves, but the

masters should have made more efforts to help them. He recommended giving at least one more day to work on it, the plantation managers should procure the best seeds possible, such as Indian corn, and they should provide only the most nourishing flour. They should also prepare a pot of nutritious vegetables and meat to make sure the slaves are fed daily. These measures would not only be good for their health, it would secure the masters against theft, rebellion and escape while foregoing the act of buying new slaves.[74] Collins made no recommendations on the constitution of the diet that should be adopted though, thus his work can be more broadly defined as part of amelioration policies rather than specifically being of the West Indian diet.

Sixteen years after the publication of *The Medical Assistant*, Dr. John Williamson wrote in 1817 in his *Medical and Miscellaneous Observations Relative to the West India Islands* that: "The dietary of negroes in hospital must be suited to local circumstances, so different from European diet; and there would not be much difficulty in selecting that from their own properties which would form the most wholesome food for them in sickness. A little animal food might be required for some, to assist the nutritious properties of their excellent pots; but many of them, while in hospital, would require no such assistance."[75] Williamson's writing shows that eventually the West Indian diet was recommended to the slaves because it had proven to increase health in the tropical climate of the Caribbean. This also hints at the fact that race might not have played a role in nutrition, doctors recommended the same diet for Europeans and Africans if possible. What seems to have made the difference was the social and economic reality of these two groups, recommendations for the enslaved Africans were more limited than for the free Europeans.

Africans would benefit from adopting a West Indian diet just as the Europeans did because they suffered at the hands of the same disease.

In the context of the West Indian diet, breadfruit had an interesting role, because it was exactly the kind of nutritious staple that it recommended, it was a starchy vegetable that comes from a tropical climate. At the same time, it had not been transplanted under its hospice, it was rather a security for the plantation owners and a scientific experiment for the British Navy. For those who had organized the transplantation, this scientific experiment was a triumph that paved the way to other projects of the kind. Bligh's voyage was an outstanding success, he and his crew had transported thousands of plant specimens around the globe, with minimal plant loss and no mutiny this time. The plants had then been successfully transplanted in the public gardens of St-Vincent and Jamaica, and from these gardens spread throughout the island to grow inside the slaves' provision ground. In 1810, when the Liguanea garden was sold, nearly ten thousand breadfruit shrubs had been transplanted on the island. The breadfruit trees adapted very well to their new home, they grew tall and produced fruit in the same quantities as in Tahiti as well as in quality. For the planters, this was only the first phase, now breadfruit needed to become the slaves' principal staple, but they had not accounted for the fact that the slaves might not be as interested in breadfruit as they were. Due to this arrogant oversight, the introduction of breadfruit was a dismal failure, the slaves refused to eat it; instead they fed it to pigs. Thus, breadfruit never became the important staple it was meant to be during the slavery period, and it could not take a role in the adoption of the West Indian diet by the slaves if such an event happened. The transplantation of breadfruit and the other amelioration projects never worked because they could never solve the real problem, which was slavery. By the time

it would be adopted, after emancipation in 1838, nutrition had completely changed, chemists had started to identify the nutritional elements inside food, and the medical paradigm was also undergoing a profound transformation, thus the West Indian diet was a thing of the past. Breadfruit proved eventually to be an important part of Jamaican diet, it is now a national staple of their cuisine, and still to this day, scientific articles are written about the miraculous potential that breadfruit has to fix malnourishment issues in underdeveloped countries.

Conclusion

Throughout this thesis, we have demonstrated that British West Indian doctors created a diet tailored to the health needs of the inhabitants of the West Indies as a preventive measure against the tropical disease environment. By following the life of the Jamaican physician and botanist Thomas Dancer, we have been able to see how nutrition, medicine and botany have come together to explain the necessity of such a diet and the reasons behind the choices it counsels. The three populations researched, soldiers, slaves and colonists, were affected by yellow fever and malaria to such an extent that it impeded the reproduction of whites and blacks and the deployment of troops in the Caribbean. This was problematic for the colonial government, keeping its principal sugar producing colony led to staggering costs. European medicine was ineffective in treating tropical diseases and doctors had a hard time finding new cures, but if they could not cure the disease, at least they could prevent it by issuing measures such as sanitation and healthy eating. By researching the West Indian diet, we have seen how the conceptualization of the environment can influence medicine and nutrition, how food science evolved in the colonies, and identify elements of a pre-modern nutritional paradigm. We have also seen how different factors can influence positively or negatively scientific efforts in the colonial environment. The inability of Dancer to properly maintain his correspondences made him a less suitable partner in Joseph Banks botanical plans for the empire. Soon after the arrival of breadfruit on the island, the House of Assembly did not properly support the two public gardens on the island, Dancer's botanical venture could not grow to the extent that he wished, and the project was stalled indefinitely. Although Dancer's work was in the

scientific zeitgeist, these factors doomed him to fail in this domain, but his medical work, summarized in *The Medical Assistant*, would prove to be his final legacy.

The first population studied was the soldiers. Thomas Dancer accompanied the 60th and 79th British regiments to a military expedition against the San Juan Spanish military fort in Nicaragua and this disastrous experience led to Dancer's first publication, *A Brief History of the Late Expedition Against Fort San Juan*, where he discussed how yellow fever and dysentery killed most of the expedition and why sanitation was to blame. This publication joined a plethora of other books on the poor state of soldier's health in the Caribbean. Soldiers' health problems also extended at sea, soldiers would get sick as they travelled from England to Jamaica, thus when they arrived, most of the regiment was unfit for duty. One of the key elements of this trouble had been identified as the food consumed on board the ship. John Bell blamed the putrid meat and lack of drinkable water as the principal source of disease on board ships. If the ship had not been properly equipped with provisions, soldiers could also suffer from shortages, adding malnutrition to food poisoning. John Bell and William Wright counselled soldiers to eat less meat and more vegetables on board, and not to eat and drink excessively; Wright even gave a precise dietetic guide with proper food to eat in the right quantities. Benjamin Moseley proposed that soldiers should be seasoned as they enter a different climate, that is they should change their diet as they would go from the cold European climate to the warm West Indian one; the adoption of this new diet should be pursued if they stayed in the West Indies. John Hunter thought that the government should manage the diet of the sick soldiers stationed in hospitals to ensure a proper diet. We know that the Admiralty Board started to properly equip long voyages with a maximum of provisions and a distiller to produce drinkable water, but we do not

know if this was also adopted on board the ships transporting troops across the Atlantic. The principal response to this crisis by the Admiralty Board was the implementation of the military hospital system, replacing boarding houses with properly furnished installations dedicated to receiving sick soldiers, which proved to be effective after a few years. Still, the discussion about soldiers' diet enables us to identify the first elements of the West Indian diet, that is the preponderance of vegetables over meat and the process of seasoning the organism.

The diet of slaves was not as researched by physicians as it was for soldiers or colonists, but it led to one of the most important scientific experiments of the eighteenth century, the transplantation of breadfruit from Tahiti to the West Indies. This chain of events highlights how the masters conceptualized the need of their workforce. The provisional system had been built around two sources, the provision ground, where the slaves worked to procure the core staples of their diet like plantain and yams; and the masters' allotments of foods that could not be produced on the island. This system was thought to be perfect by the planters, the provision ground required little investment on their part to take care of most of the slaves' nutritional needs while also creating a feeling of belonging to the plantation by the annexation of their gardens, but the food allotted created a dependence that allowed further control while making sure their slaves were healthy.[1] Historians were able to clearly demonstrate that even when this system worked without any impediments, it was still barely enough to accommodate the needs of slaves, women and men, under the extreme conditions they were in. Masters only started doubting this system after the concurrence of the disastrous events of the 1780s and the rise of anti-slavery sentiment in England and Europe. Planters developed amelioration policies to give

better care to the slaves, and breadfruit was part of this effort, it could also be said that the West Indian was also in part an answer to this. Dancer's *Medical Assistant* was intended for families and plantations, and doctors in the ensuing years would also recommend its adoption.

Breadfruit as received a lot of attention from historians, but there are still opportunities for research. There is very little information on how breadfruit was to be placed within the provision grounds, or how the slaves were to know how to properly take care of the tree and eat the fruit. James Wiles seemed to have been the person in charge of this, but there is no source that describes how he transmitted if he did so. More research should also be pursued on the geography of provision grounds, their emplacement within the plantation, but also their size and the distribution of plants would be an invaluable tool to better assess their productivity and how enslaved Africans could circumvent the restricted land they had. By better understanding how provision grounds were set up and where breadfruit would have fit in, we could better know the reasons why slaves rejected breadfruit and the food history of the slaves in general.

Although the experiment was a success for Banks, science and the British Navy, the slaves refused to eat it. The historical reason generally given for the slaves' rejection of breadfruit was because of its strange appearance, it was unlike anything they had ever seen in Africa or America. We can offer other factors that might better explain this initial rebuttal. The taste of breadfruit was quite different from the other staples they consumed and did not catch on quickly.[2] The automatic production of fruit from the tree freed the slaves from working on their provision ground and instead allowed them to work more on the plantation, which was probably not welcomed by the interested party. Although

working on their provision ground was necessary for their survival, the time spent there working in this small garden was their own, it was one of the few freedoms they had. The garden was also one of their few possessions aside from their clothes and their house, they had control over what would grow and how well it would produce. The products of their garden were not only consumed, it was also sold in the markets so that they could buy imported food or fish, tools, utensils and clothes. The introduction of breadfruit robbed them of this, and they wholeheartedly rejected it for fifty years, until they adopted it as one of their national staples after emancipation.[3]

The South Sea transplantation also highlights the tensions between the planter society of Jamaica and the colonial government about the situation in the West Indies and the meaning of breadfruit. From the point of view of the planters, breadfruit was a direct response to the food crisis that had befallen its slave population, like other multiple crises of the same nature that happened throughout the empire since it had massively increased its size after the Seven Years' War.[4] There was more to the request of the planters for breadfruit than to palliate the death of the slaves, because they could simply buy more slaves if they wished. The properties of breadfruit, being a nourishing plant that required very little care, made the planters hope that it would free the slaves from working in their provision grounds to allow them to put more hours into the sugar-cane fields, but also to ameliorate their health, which could curb the negative birth rate. If the slaves could augment population, or at least sustain it naturally, it would make Jamaica independent from the slave trade, which was being increasingly criticized in Europe. From the point of view of Banks and the colonial government, breadfruit was not an answer to a food crisis in Jamaica, which they denied ever existing, it was rather the first botanical project that

would prove the possibility of transplanting plant specimens from all corners of the empire. By transplanting useful plants in each colony, all citizens of the empire could take part in the economic success of the empire, and this would usher the empire into a botanical golden age. The symbolism behind breadfruit was that of scientific prowess and benevolence for the colonies from the colonial empire, but it was an attempt at control, at least in integrating all the colonies into a botanical web that would make them lose their independence.[5] This golden age would eventually happen in the 19th century, but not in the West Indies as the market for sugar would crash with the price's fall, but rather in the East with the introduction of rubber among other products.

The colonists diet is the last population that has been discussed, and it provides us with the final piece of the West Indian diet. Thomas Dancer published *The Medical Assistant* in 1801 to help households and plantations with limited to no access to doctors to prepare simple cures, identify medicinal plants and take healthy habits. In the book, Dancer gives the principal ideas behind the West Indian, which is less consumption of meat because it creates heat in the system while being digested, which is problematic in the hot tropical environment, and more vegetables, because they do not create heat and they cleansed the ingestion of putrid meat, which happened often in the West Indies. By adopting this diet, Europeans would not only become healthier in the Caribbean, but their bodies would slowly change to better adapt themselves to this alien environment, making them more resistant to yellow fever and malaria in the years to come. We have looked at the work of doctors mentioned in Dancer's book to see if this West Indian diet was a widespread idea and how each version would differ from each other. Hector McLean was stationed in St-Domingue during the time the British army had occupied the island. He

prescribed a similar diet to Dancer's, but puts further emphasis on drinking cold water, which would cool the innards. Colin Chisholm of Grenada proscribed the eating of meat during fever season and advised against its consuming high levels of it when in a tropical environment like the West Indies because its chemical composition was the same as miasmas. James Clark of Dominica stated that Europeans arriving in the West Indies should only eat indigenous vegetables and no meat until their body was acclimated to their new environment, and to revert to this diet if one fell sick. A French doctor named A.M.T. Savarésy proposed a diet like Dancer's, but he identified the sources of the nutritional problem as the spoiling of imported food and the bad quality of indigenous staples. The common element in the West Indian diet was the preponderance of vegetables over meat, the opposite of European diet. This was first due to avoid digestive problems and overheating of the body, but also because there were little indigenous animals fit for the European palate, while the indigenous plants were more accepted. The many plants offered by the island, although not all originally from this land, had been there long enough to "acquire" the qualities required to create this transformation. Europeans ate meat mostly through salted provisions or the few European animals they had imported, thus it could not impart the same tropical characteristics as indigenous vegetables could. The appreciation for these vegetables varied though, some doctors, like Dancer and Clark, wholeheartedly adopted them, while Savarésy and McLean accepted their use out of necessity.

At the turn of the nineteenth century, a chemical and medical revolution would drastically change the medical and nutritional paradigm, elements required for a healthy diet would be better identified, leading to a profound transformation in the eating habits of Europeans. The West Indian diet would thus be overruled like the medical paradigm on

which it was based, but it still provides us with an interesting view on how nutrition was conceptualized before the advent of modern nutritional science. We have identified that doctors and chemists made a distinction between foods by labelling them as "real food" or "pleasurable food." Real meant that these foods were useful in sustaining oneself, which was measured by the sensation of fullness after eating a meal. Pleasurable food was all the food that did not create this sensation, thus they provided no real nourishment, they were simply enjoyable to the palate and some could have medical properties. Nutrition was thus tied with bodily sensation, which helps us further contextualize the heat creation in the digestive tract after the consumption of meat, as well as the difference in difficulty of digesting meat and vegetables.[6] We have also observed that food was believed to contain the characteristics of the environment in which they evolved, characteristics that could be absorbed after their consumption. Therefore, some doctors recommended to season their bodies to the West Indies climate by eating indigenous staples while others preferred to keep this consumption at a minimal level so that the organism would not be become permanently weaker, as it was believed that the European constitution was the strongest because it has evolved in a cold climate, which conferred strength and courage. These elements help us to further understand the reasoning behind the dietetic choices given by doctors, scientific experiments on edible commodities and food policies enacted by authorities.

This thesis intended to add to the field of the history of food science, where there is still a lot to research to be done. The state of nutritional science is not very well-known before the nineteenth century, and that is partly because it could be said that it was not a science before that, but the work of George Fordyce and James Clark on starch as well as

the clinical trial of James Lind on scurvy are a clear example that there is interesting material to be discovered still. By knowing what elements chemists and physicians were able to identify in food would help us better understand how nutrition was conceptualized in the Early Modern Period, even if these elements turned out to be fiction. We have proposed here that food that was termed nutritious was deeply tied to the feeling of fulfillment in the stomach. By further studying the dichotomy between "real food" and "pleasure food" as well as the importance of the sensations during digestion we could have a better understanding of the reasons that led to the creation of certain diets or the emphasis put on certain staples. The process of seasoning and biological transfer of environmental characteristics after consumption could be further researched. The transformation dynamic from plants to humans is very interesting in terms of the conceptualization of the body and its relationship with nature in pre-modern medicine. There is also the potential to go beyond Dancer's life and study the evolution of nutrition in the West Indies from the beginning of the English settlement in the region, and eventually go beyond the borders of the British Empire to include the French and Spanish reality as well.

We pointed out in the introduction that although the concept of race influenced medicine in the colonial context of the West Indies, there was little mention of it when it pertains to food and diet. Because of their resistance to miasmas and diseases specific to them, tropical doctors described Africans as subhuman, which helped explain the discrepancies in their medical theories, but they had not extended this difference to food. That is probably because Europeans and Africans could eat the same diet without any problems, thus it was useless to remark upon it if one wanted to further establish this theory, but it could have been used to counter its arguments. More research could be dedicated to

the connection between food history and racial history, not only concerning Europeans and Africans, but all the purported races that were established during the eighteenth and nineteenth centuries. It would be very interesting to see if food played any role in creating racial differences in a similar way to Fordyce's natural hierarchy organized through digestive ability. The same could be said with gender. In *The Medical Assistant*, Dancer recommended a vegetarian diet only to women, children and the old aged because they were of a sanguine temperament, which was worsened by meat. This is an interesting comment that opens the door to new opportunities to understand gendered and sexual relationships with food and medicine. It would be interesting to see how the tropical climate, humoral theory, and food influenced the care given to women, either white or black. Dancer dedicates a whole chapter of his book to curing complaints specific to women and children, but he only gives attention to the diet of infants, but it would have been interesting to know more about the care required for a pregnant woman.[7] It is possible that Dancer did not think that pregnant required a special diet, nor did children, after a certain age. The importance of nutrition in the eighteenth century can be complex to assess because of its poorly defined state, but Dancer's work shows that there was a concern from doctors in a colonial environment to properly feed the populations under their care, and by promoting it through their books, as well as trying to introduce new staples like breadfruit through botanical networks, we can see that it was an important element in preventing diseases in the tropical environment

Endnotes

Introduction:

[1] Powell, Dulcie. "The Voyage of the Plant Nursery, H.M.S. Providence, 1791–1793" *Economic Botany* 31, No. 4 (Oct. —Dec. 1977): 402.

[2] Powell: 391.

[3] Powell: 400–401.

[4] Jamaica, ed. *Journals of the Assembly of Jamaica*. St Jago de la Vega: J. Lunan, 1811. Vol. 9, p. 249.

[5] Powell: 389.

[6] Drayton, Richard Harry. *Nature's Government: Science, Imperial Britain, and the "Improvement" of the World*. (New Haven: Yale University Press, 2000), p. 79.

[7] Powell: 389.

[8] Parry, John H. "Plantation and Provision Ground: An Historical Sketch of the Introduction of Food Crops into Jamaica" *Revista de Historia de América*, 39 (June 1955): 19.

[9] Jackson, B. D. "Oxford DNB Article: Dancer, Thomas." Accessed October 2, 2017, last modified on May 27, 2010. http://0-www.oxforddnb.com.mercury.concordia.ca/view/article/7102.

[10] Ogborn, M. "Talking Plants: Botany and Speech in Eighteenth-Century Jamaica." *History of Science* 51, No. 3 (September 2013): 264–265.

[11] Brown, Vincent. *The Reaper's Garden: Death and Power in the World of Atlantic Slavery*. (Cambridge, Mass: Harvard University Press, 2008): 17, 54; McNeill, John Robert. *Mosquito Empires: Ecology and War in the Greater Caribbean, 1620–1914*. (New Approaches to the Americas. New York: Cambridge University Press, 2010): 67.

[12] Harrison, Mark. *Medicine in an Age of Commerce and Empire: Britain and Its Tropical Colonies, 1660–1830*. (Oxford: Oxford University Press, 2010.), p. 64.

[13]Banks, Joseph, and Neil Chambers. *Scientific Correspondence of Sir Joseph Banks, 1765–1820*. (London; Brookfield, Vt.: Pickering & Chatto, 2007.), p. LXV. The state of Banks correspondence sheds light on the reasons why not all of Dancer's correspondence is lost. What is left of Dancer's letters can be found at the University of New South Wales, Kew Gardens Archives, the British Library Archives, and the Royal Society. Banks letters have received much more attention and they are distributed in multiple sets of archives, reprinted in books or available online. James Wiles correspondence with Banks can also be found at the University of New South Wales and the British Library Archives.

[14] On this, see: Ragatz, Lowell J. *The Fall of the Planter Class in the British Caribbean, 1763–1833: A Study in Social and Economic History*. (New York: Octagon Books, 1963). Burnard, Trevor G. "Harvest Years? Reconfigurations of Empire in Jamaica, 1756–1807," *The Journal of Imperial and Commonwealth History* 40, No. 4 (November 2012): 533–555. (Burnard brings in the distinction the American Revolution started a psychological and moral decline that eventually led to the rest.)

[15] For further reading: Watts, David. *The West Indies: Patterns of Development, Culture, and Environmental Change since 1492*. (Cambridge Studies in Historical Geography 8. Cambridge [Cambridgeshire]; New York: Cambridge University Press, 1987). McCusker, John J. *Essays in the Economic History of the Atlantic World*. (London; New York: Routledge, 1997).

[16] Pitman, Frank Wesley. *The Development of the British West Indies, 1700–1763*. (Hamden, Conn.: Archon Books, 1967); Ragatz, Lowell J. *The Fall of the Planter Class;* Roberts, G. W. *The Population of Jamaica*. (A Conservation Foundation Study. Cambridge [Eng.]: Published for the Conservation Foundation at the University Press, 1957.)

[17] Dunn, Richard S. *Sugar and Slaves: The Rise of the Planter Class in the English West Indies, 1624–1713*. (Chapel Hill: Published for the Omohundro Institute of Early American History and Culture, Williamsburg, Virginia, by the University of North Carolina Press, 2000.); Shepherd, Verene, ed. *Working Slavery, Pricing Freedom: Perspectives from the Caribbean, Africa and the African Diaspora*. (New York: Palgrave, 2002.); Brown, Vincet, *The Reapers' Garden*.

[18] Morgan, Philip D. *Slave Counterpoint: Black Culture in the Eighteenth-Century Chesapeake and Lowcountry*. (Chapel Hill: Published for the Omohundro Institute of Early American History and Culture,

Williamsburg, Virginia, by the University of North Carolina Press, 1998.); McDonald, Roderick A. *The Economy and Material Culture of Slaves: Goods and Chattels on the Sugar Plantations of Jamaica and Louisiana*. (Baton Rouge: Louisiana State University Press, 1993.)
[19] Parry, p. 8.
[20] Dunn, p. 263–278.
[21] McDonald, p. 18–23, 33.
[22] Kiple, Kenneth F. *The Caribbean Slave: A Biological History*. (Studies in Environment and History. Cambridge [Cambridgeshire]; New York: Cambridge University Press, 1984): 76.
[23] Harrison, p. 5.
[24] See: Sheridan, Richard B. *Doctors and Slaves;* Kiple, Kenneth F. *The Caribbean Slave: A Biological History*.
[25] Brown, p. 54.
[26] For more on the demographic data of Jamaica in this period: Roberts, G. W. *The Population of Jamaica*. (A Conservation Foundation Study. Cambridge [Eng.]: Published for the Conservation Foundation at the University Press, 1957).
[27] For more on this issue, see: Boulle, P. H. *Race et esclavage dans la France de l'Ancien Régime.* (Paris, France: Perrin, 2007); Duchet, Michèle. 1971. *Anthropologie et histoire au siècle des lumières: Buffon, Voltaire, Rousseau, Helvetius, Diderot.* (Paris: F. Maspero); Jordan, Winthrop D. 1968. *White over black: American attitudes toward the Negro, 1550–1812*. (Chapel Hill: Published for the Institute of Early American History and Culture at Williamsburg, Va., by the University of North Carolina Press); Harrison, Mark. 1996. "'The tender frame of man': Disease, climate and racial difference in India and the West Indies, 1760–1860." *Bulletin of the History of Medicine,* 70:1, p.68-93; Rigotti, Francesca. April/June 1986. "Biology and society in the age of enlightenment." *Journal of the History of Ideas,* 47, p.215-33.
[28] Kiple, *The Caribbean Slave*, p. 178.
[29] See: Arnold, David J. *Warm Climates and Western Medicine the Emergence of Tropical Medicine, 1500–1900*. (Amsterdam; Atlanta [GA]: Rodopi, 2003.); Harrison, Mark. *Medicine in an Age of Commerce and Empire: Britain and Its Tropical Colonies, 1660–1830*. McNeill, John R. *Mosquito Empires: Ecology and War in the Greater Caribbean, 1620–1914*. (New Approaches to the Americas. New York: Cambridge University Press, 2010.); and note 18.
[30] Sheridan, *Doctors and Slaves*, p. 44.
[31] For example, Dancer recommended to apply the cinchona bark on the skin to cure malaria, which did not enable any intake of quinine, the medical element against the disease; McNeill, p. 74.
[32] McNeill, p. 71.
[33] Harrison, p. 64, 85.
[34] See: Chaplin, Joyce E. *Round about the Earth: Circumnavigation from Magellan to Orbit*. (New York: Simon & Schuster Audio, 2014.); McNeill, *Mosquito Empire*; Harrisson, *Medicine in an Age of Commerce and Empire*.
[35] Convertito, Cori. "Mending the Sick and Wounded: The Development of Naval Hospitals in the West Indies, 1740–1800." *Canadian Journal of History* 51, No. 3 (Winter 2016)
[36] Stearns, Raymond Phineas. *Science in the British Colonies of America*. (Urbana: University of Illinois Press, 1970.)
[37] Burnard, Trevor G. *Mastery, Tyranny, and Desire: Thomas Thistlewood and His slaves in the Anglo-Jamaican World*. (Chapel Hill: University of North Carolina Press, 2004.)
[38] Drayton, pp. 89–91.
[39] Ogborn, p. 265.
[40] Spary, E. C. *Feeding France: New sciences of food, 1760–1815*. (Cambridge; New York: Cambridge University Press, 2014.)
[41] Zilberstein, Anya. "Inured to Empire: Wild Rice and Climate Change." *William & Mary Quarterly* 72, No. 1 [January 2015]: 129, 140.
[42] Earle, R. "Food, Colonialism and the Quantum of Happiness." *History Workshop Journal* 84, No. 1 (January 2017): 171–93.

Chapter 1:
[1] *Reports of the Lords of the Committee of Council Appointed for the Consideration of All Matters Relating to Trade and Foreign Plantations; Submitting … the Evidence and Information They Have Collected in*

Consequence of His Majesty's Order in Council, Dated the 11th of February 1788, Concerning the Present State of the Trade to Africa, and Particularly the Trade in Slaves, Etc., 1789. Jamaica appendix.
[2] Spary, Emma, and Paul White. "Food of Paradise: Tahitian Breadfruit and the Autocritique of European Consumption." *Endeavour* 28 (January 1, 2004): 76.
[3] Who had returned to England, had been court-martialled, but proved not guilty.
[4] Jackson, B. D. "Oxford DNB Article: Dancer, Thomas."
[5] Brown, p. 17.
[6] Johnston, Katherine. "The constitution of empire: place and bodily health in the eighteenth-century Atlantic", *Atlantic Studies*, Vol. 10, No. 4: 455
[7] Dancer would eventually change his stance on the tropical climate, from dangerous to healthy for the body and the mind. Tropical climate was good for relaxing the body at an old age and was also beneficial for the young, it could also cure depression. He now blamed moisture in the air as the principal source of danger, either in a hot or cold climate. *The Medical Assistant*, p. 18.
[8] Kiple, p. 106, 107, 112; Brown, p. 56.
[9] Sheridan, Doctors and Slaves, pp. 228–229; Kiple, p. 118; Morgan, Kenneth. *Slavery and the British Empire: From Africa to America*. (Oxford; New York: Oxford University Press, 2007), p. 92.
[10] John Williamson. *Medical and Miscellaneous Observations Relative to the West India Islands*. (Printed by A. Smellie for the author, 1817), p. 257.
[11] McNeill, p. 71.
[12] Long, Long, Edward. *The History of Jamaica. Or, General Survey of the Antient and Modern State of That Island: With Reflections on Its Situation, Settlements, Inhabitants, ... In Three Volumes. Illustrated with Copperplates*. (London: printed for T. Lowndes, 1774, Vol. 2), p. 588.
[13] Sheridan, *Doctors and Slaves*, p. 44.
[14] Dancer, Thomas. *A Brief History of the Late Expedition against Fort San Juan, so Far as It Relates to the Diseases of the Troops: Together with Some Observations on Climate, Infection and Contagion; and Several of the Endemial Complaints of the West-Indies.* (D. Douglass & W. Aikman: Kingston, Jamaica, 1781), pp. 7–8. One hundred soldiers of The Loyal Irish Corps and two hundred Jamaican volunteers accompanied the two regiments.
[15] Moseley, Benjamin, London School of Hygiene and Tropical Medicine, and London School of Hygiene and Tropical Medicine. *A Treatise on Tropical Diseases; on Military Operations; and on the Climate of the West-Indies [Electronic Resource]*. (London: Printed by Nichols and Son, for T. Cadell and W. Davies, 1803), pp. 135–136.
[16] In this section, Dancer provides an interesting account of the help provided by the natives accompanying the expedition. The natives had a far better understanding of the complicated geography of the jungle, they would guide the expedition through the best routes, row the boats and hunt game to provide the soldiers. As they were marching through the jungle, one soldier was bitten by a snake, and the natives gave Dancer their cure against snake bite, but as they could not get the elements required in time, the soldier died; Dancer than proposes that further research into the natives' antidotes should be pursued. Although he praises their aid, he describes them as rather weak, both in body and mind, while the biracial natives were stronger. Dancer, *A Brief History of the Late Expedition Against Fort San Juan*, pp. 11–12, 14–15.
[17] Dancer, *A Brief History of the Late Expedition Against Fort San Juan*, pp. 16–18.
[18] Dancer, *A Brief History of the Late Expedition Against Fort San Juan*, p. 23.
[19] Moseley, Benjamin, p. 146.
[20]Brunton, Deborah. "Oxford DNB: Moseley, Benjamin" Accessed on April 6, 2018, last modified on September 23, 2004, http://0-www.oxforddnb.com.mercury.concordia.ca/view/10.1093/ref:odnb/9780198614128.001.0001/odnb-9780198614128-e-19387?rskey=VqYuZp&result=1
[21] Moseley, p. 163.
[22] Convertito: 501–504.
[23] Hunter, John. *Observations on the Diseases of the Army in Jamaica: And on the Best Means of Preserving the Health of Europeans, in That Climate*. (London: Printed for G. Nicol, Pall-Mall, bookseller to His Majesty, 1788), pp. 44–47.
[24] Hunter, pp. 53–54.
[25] Hunter, pp. 70–71.
[26] Dancer, *A Brief History of the Late Expedition Against Fort San Juan*, pp. 28–30.
[27]Dancer, *A Brief History of the Late Expedition Against Fort San Juan*, p. 48.

[28] Jesuit Bark is taken from the Cinchona tree in Peru, from which you can derive quinine, the most successful anti-malarial drug. It was called Jesuit Bark because the Jesuits had brought it back to Europe in the Seventeenth Century.
[29] Wright, William. *Memoir of the Late William Wright, M. D. with Extracts from His Correspondence, and a Selection of His Papers on Medical and Botanical Subjects*. (Edinburgh: Blackwood, 1828), p. 199; McNeill, pp. 74–75.
[30] Hunter, pp. 30–31; Moseley, p. 163.
[31] Hunter, p. 37.
[32] Hunter, p. 44, 323.
[33] Moseley, p. 415.
[34] Long, p. 505.
[35] Bell, John. *An Inquiry into the Causes Which Produce, and the Means of Preventing Diseases among British Officers, Soldiers, and Others in the West Indies: Containing Observations on the Mode of Action of Spirituous Liquors on the Human Body, on the Use of Malt Liquor, and on Salted Provisions, with Remarks on the Most Proper Means of Preserving Them: Also Notes Relating to Some Particulars in the British Army in Ireland and the West Indies*. (London: Printed for J. Murray, 1791), p. 126.
[36] Long, vol. 2, p. 524. Long's prescribed diet is based on his readings of Dr. Richard Brocklesby's work.
[37] Long, vol. 2, pp. 524–526.
[38] Long vol. 2, p. 527, 555.
[39] Bell, pp. 40–41, 104.
[40] Bell, p. 105.
[41] Bell, p. 109.
[42] Wright, p. 423, 430.
[43] Chaplin, 114–122.
[44] In Watt, J, E. J Freeman, W. F Bynum, and National Maritime Museum (Great Britain), eds. *Starving Sailors: The Influence of Nutrition upon Naval and Maritime History*. (London: National Maritime Museum, 1981.), p. 9, 11, 13.
[45] Dancer, *A Brief History of the Late Expedition Against Fort San Juan*, p. 56.
[46] Hunter, pp. 21–22.
[47] Long, p. 558, 559, 561.
[48] Wright, p. 423.
[49] Dancer, Thomas, John Lunan, Edward Scriven, and John Redman Coxe. *The Medical Assistant, or Jamaica Practice of Physic: Designed Chiefly for the Use of Families and Plantations*. (St. Jago de la Vega [Jamaica]: Printed by John Lunan, printer to the Honourable Council, 1801), pp. 31–32.
[50] Letter sent to William Forsyth, dated January 9, 1788. Forsyth, William. *Foreign Letters, Correspondence, William Forsyth Papers*, Archive, Kew Royal Botanic Gardens, 5 June 1780-25 July 1803.
[51] Dancer, Thomas. *A Short Dissertation on the Jamaica Bath Waters: To Which Is Prefixed, an Introduction Concerning Mineral Waters in General; ... Y Thomas Dancer, ...* (D. Douglass & Alex. Aikman, 1784), p. 95.
[52] Drayton, p. 59.
[53] Burnard, *Mastery, Tyranny, and Desire,* p. 124.
[54] Jackson, B. D. "Oxford DNB: Forsyth William" Accessed on April 6, 2018, last modified on May 27, 2010, http://0-www.oxforddnb.com.mercury.concordia.ca/view/10.1093/ref:odnb/9780198614128.001.0001/odnb-9780198614128-e-9933?rskey=n3YCEq&result=2
[55] Forsyth, William. *Foreign Letters, Correspondence, William Forsyth Papers*. (Archive, Kew Royal Botanic Gardens, 5 June 1780-25 July 1803).
[56] Sheridan, "The Crisis of Slave Subsistence": 620–625.
[57] Sheridan, *Doctors and Slaves*, p. 158.
[58] Beckford, William, and Pre-1801 Imprint Collection (Library of Congress) DLC [from old catalog]. *A Descriptive Account of the Island of Jamaica: With Remarks upon the Cultivation of the Sugar-Cane, throughout the Different Seasons of the Year, and Chiefly Considered in a Picturesque Point of View; Also Observations and Reflections upon What Would Probably Be the Consequences of an Abolition of the Slave-Trade, and of the Emancipation of the Slaves*. (London, Printed for T. and J. Egerton, 1790), p. 107.
[59] Beckford, p. 115.

[60] Beckford, p. 132.
[61] Sheridan, *Doctors and Slaves*, p. 159.
[62] Mulcahy, Matthew. *Hurricanes and Society in the British Greater Caribbean, 1624–1783*. (Johns Hopkins pbk. ed. Early America. Baltimore, Md: Johns Hopkins University Press, 2008), p. 111.
[63] Mulcahy, p. 105.
[64] Beckford, p. LV; Sheridan, "The Crisis of Slave Subsistence": 628.
[65] Marsden, Peter. *An Account of the Island of Jamaica; with Reflections on the Treatment…* (Printed for the author by S. Hodgson, 1788), p. 15.
[66] *Reports of the Lords*
[67] Sheridan, *Doctors and Slaves,* p. 161. Mulcahy, p. 114.
[68] Mulcahy, p. 116.
[69] Roberts, G. W., p. 31.
[70] Dunn, pp. 272–276.
[71] Beckford, p. 138.
[72] Sheridan, *Doctors and Slaves,* p. 169; Morgan, p. 91; Dunn; pp. 272–278; McDonald, p. 18, 31, 33, 81.
[73] Dancer, Thomas; Long, Edward; More, Samuel. *Correspondence of Thomas Dancer, M. D, island botanist, with Edward Long [late Judge of the Vice-Admiralty Court in Jamaica] and Samuel More, Secretary to the Society of Arts in London, upon scientific matters* (Western Manuscripts, Archives and Manuscripts, British Library, 8 Apr 1787-20 Jul 1791).
[74] Robertson, J. "Eighteenth-Century Jamaica's Ambivalent Cosmopolitanism." *History* 99 (337): 609.
[75] Gascoigne, John. *Science in the Service of Empire: Joseph Banks, the British State and the Uses of Science in the Age of Revolution*. (Cambridge, UK; New York, NY: Cambridge University Press, 1998), pp. 130–131.
[76] Dancer, Thomas, and Botanical Garden (Jamaica). *Catalogue of Plants, Exotic and Indigenous, in the Botanic Garden, Jamaica*. (St. Jago de la Vega: Printed by Alexander Aikman for the House of Assembly), 1792.

Chapter 2:
[1] Dancer, Thomas, *The Medical Assistant,* p. II
[2] Stearns, p. 382; Brown, Vincent, p. 16, 23.
[3] Burnard, *Master Tyranny and Desire*, p. 106; Easterby-Smith, Sarah. "Reputation in a Box. Objects, Communication and Trust in Late 18th-Century Botanical Networks." *HISTORY OF SCIENCE* 53, No. 2 (June 2015): 184.
[4] Robertson: 615–616.
[5] Eyre, Alan. *The Botanic Gardens of Jamaica.* (London: Deutsch, 1966), p. 20-21.
[6] Spary in Schiebinger, Swan, p. 189; Drayton, 89, 112.
[7] McClellan, James E. *Colonialism and Science: Saint Domingue in the Old Regime*. (Baltimore: Johns Hopkins University Press, 1992), pp. 8–9, 147–148.
[8] Gascoigne, p. 130–131.
[9] Jamaica, ed. *Journals of the Assembly of Jamaica*, Vol. 9, p. 210, 248–251. Wiles, James and Banks, Joseph. *Sir Joseph Banks Papers, Correspondence, Banks's letters* (Folio 103, Archive, Kew Royal Botanic Gardens, 1793-1799-1801).
[10] Jamaica, ed. *Journals of the Assembly of Jamaica*. Vol. 9, pp. 248–251, p. 344. Smith, Christopher and Wiles, James. *"Gardiners on the Providence", being letters received by Banks from James Wiles and Christopher Smith, with related papers, concerning the breadfruit voyage of HM Ships Providence and Assistant, William Bligh, 1791–1793*. (State Library, New South Wales, 1791–1794), 1797 http://www2.sl.nsw.gov.au/banks/series_52/52_view.cfm
[11] Jamaica, ed. *Journals of the Assembly of Jamaica*. Vol. 9, p. 344.
[12] The Liguanea garden produced other plants from the South Sea voyage which it distributed with breadfruit shipments, but to a lesser extent than the Bath garden because it had fewer specimens to begin with.
[13] Jamaica, ed. *Journals of the Assembly of Jamaica*. Vol. 10, p. 69, 285, 469–470.
[14] Jamaica, ed. *Journals of the Assembly of Jamaica*. Vol. 10, 469–470, 498, 517; Dancer, Thomas. *The Medical Assistant, Third Edition* (in Golding, John R. S. *Ascent to Mona*); Wiles, James. *Sir Joseph Banks Papers*, letter dated 1801; Dancer, Thomas. *Letter from Dr. Thomas Dancer about his re-appointment as*

island botanist on Jamaica and about Dr. Van Eikharts new metallic composition, Archives, Royal Society of Arts, 1804, Ref. No. RSA/PR/MC/105/10/70.
[15] Dancer, Thomas. *Some Observations Respecting the Botanical Garden.* (Jamaica: Printed at His Majesty's Printing Office, 1804), pp. 4–6; Jamaica, ed. *Journals of the Assembly of Jamaica*. Vol. 11, p. 242.
[16] Dancer, Thomas. *Letter from Dr. Thomas Dancer about his re-appointment as island botanist on Jamaica and about Dr. Van Eikharts new metallic composition* (Archives, Royal Society of Arts, 1804, Ref. No. RSA/PR/MC/105/10/70); Jamaica, ed. *Journals of the Assembly of Jamaica*. Vol. 11, p. 246, 267–268, 280.
[17] Jamaica, ed. *Journals of the Assembly of Jamaica*. Vol. 12, pp. 319–320, 338–339, 347–348.
[18] Jamaica, ed. *Journals of the Assembly of Jamaica*. Vol. 9, p. 249; Alexander, Caroline. "Captain Bligh's cursed breadfruit: the biographer of William Bligh—he of the infamous mutiny on the Bounty—tracks him to Jamaica, and the completion of his star-crossed mission." Smithsonian, Sept. 2009, p. 56+. Canadian Periodicals Index Quarterly, http://0-link.galegroup.com.mercury.concordia.ca/apps/doc/A207123505/CPI?u=concordi_main&sid=CPI&xid=b29a46ce. Accessed 23 Jan. 2018.
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[21] Wiles, Banks, *Sir Joseph Banks papers*; Dancer, Thomas. *Letter from Dr. Thomas Dancer about breadfruit*.
[22] Mintz, Sidney Wilfred. *Sweetness and Power: The Place of Sugar in Modern History*. (New York, N.Y.: Viking, 1985.), pp. 37–39; Parry, p. 9.
[23] Smith, Christopher and Wiles, James. *"Gardiners on the Providence"*
[24] Easterby-Smith: 192.
[25] Dancer, *Letters and plants lists received by Banks*, letter dated circa 1792.
[26] Dancer, *Letters and plant lists received by Banks*, letter dated January 10, 1793.
[27] Alexander, Caroline. "Captain Bligh's Cursed Breadfruit."
[28] Dancer, *Letters and plant lists received by Banks*, letter dated April 3, 1793. Jamaica, ed. *Journals of the Assembly of Jamaica*. Vol. 9, p. 251. Powell, p. 405.
[29] Dancer, *Letters and plant lists received by Banks*, letter dated April 3, 1793; Dancer, *Letters and plant lists received by Banks*, letter dated June 5, 1793; Powell, p. 409, 412.
[30] Jamaica, ed. *Journals of the Assembly of Jamaica*. Vol. 9, pp. 250–251. Powell, p. 405.
[31] Dancer, *Letters and plant lists received by Banks*, letter dated March 28, 1793.
[32] Dancer, *Letters and plant lists received by Banks*, letter dated July 15, 1793.
[33] Dancer, Thomas. *Letter from Dr. Thomas Dancer about his work and conditions in Jamaica*, Archives, Royal Society of Arts, 1790, Ref. No. RSA/PR/MC/104/10/60.
[34] Dancer, *Letter about his work conditions*; Forsyth, William. *Foreign Letters*; letters dated
[35] Easterby-Smith: 186.
[36] Powell, p. 407; Ogborn, p. 265.
[37] Forsyth, William. *Foreign Letters*; Dancer, *Letters and plant lists received by Banks*.
[38] Dancer, *The Medical Assistant*, p. III.
[39] Dancer, *The Medical Assistant*, p. 26.
[40] Dancer, *The Medical Assistant*, pp. 29–31.
[41] Dancer, *The Medical Assistant*, p. 27.
[42] Dancer, *The Medical Assistant*, p. 28.
[43] Spary, *Feeding France*, pp. 89–93.
[44] Fordyce says that mucilage is a term that is often hackneyed to describe only one substance.
[45] Fordyce, p. 91, 93–94, 98, 103, 104, 107.
[46] Fordyce, p. 114–116.
[47] Fordyce, p. 74–75.
[48] Fordyce, p. 77, 84.
[49] Fordyce, p. 89.

[50] Fordyce, p. 91.
[51] Fordyce, p. 90.
[52] Fordyce, p. 88.
[53] McLean, Hector. *An Enquiry into the Nature, and Causes of the Great Mortality among the Troops at St. Domingo: With Practical Remarks on the Fever of That Island; and Directions, for the Conduct of Europeans on Their First Arrival in Warm Climates. By Hector McLean, M.D. Assistant Inspector of Hospitals for St. Domingo.* (London: Printed for T. Cadell, Jun. and W. Davies [successors to Mr. Cadell] in the Strand, 1797), p. VI.
[54] McLean, pp. 250–262.
[55] Goodwin, Gordon. "Chisholm, Colin", Oxford Dictionary of National Biography, last modified on September 25, 2014. http://0-www.oxforddnb.com.mercury.concordia.ca/view/10.1093/ref:odnb/9780198614128.001.0001/odnb-9780198614128-e-5322?rskey=BEWDSF&result=1
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[59] This statement should be investigated further, the reasons why bitter cassava was more used than sweet cassava could be due to more than just speed of growth and imbecility.
[60] Starch has no medical properties to speak, it is produced by plants as energy storage, thus its high nutritional quality.
[61] Savarézy, p. 232.
[62] Savarézy, p. 448, 456–457.
[63] Zaugg, Roberto, and Andrea Graf. "Guerres napoléoniennes, savoirs médicaux, anthropologie raciale. Le médecin militaire Antonio Savaresi entre Égypte, Caraïbes et Italie." *Histoire, médecine et santé*, no. 10 (novembre 15, 2016): 17.
[64] Carpenter, p. 638.
[65] Spary, *Feeding France*, pp. 94–97.
[66] Zilberstein, p. 146.
[67] Parry, p. 8.
[68] Sheridan, *Doctors and Slaves*, p. 68.
[69] Beckford, Vol. 2, 143, 150.
[70] Burnard, *Master, Tyranny and Freedom*, p. 154.
[71] Sheridan, *Doctors and Slaves*, p. 167.
[72] Kiple, p. 81
[73] Sheridan, *Doctors and Slaves*, p. 283.
[74] Collins, Robert. *Practical Rules for the Management and Medical Treatment of Negro Slaves in the Sugar Colonies*. (J. Barfield, 1803), p. 87–112
[75] Williamson, pp. 190–191.

Conclusion:
[1] Burnard, *Master Tyranny and Desire*, p. 226.
[2] Collins, *Practical Rules*, p. 111.
[3]Sokolov, Raymond. "A Fruit Freely Chosen." (*Natural History* 102, No. 9 September 1993): 76; Parry, p. 19; McDonald, p. 33; It is also entirely possible that the breadfruit tree did not produce enough to feed

the slaves despite the reports of the committee on its flourishing state, and that its odd taste took time to catch on, enough time to coincide with emancipation in 1834.

[4] Gascoigne, *Science in the Service of Empire*, pp. 114–117.

[5] Earle, pp. 176–177.

[6] This could also be explained by the fact that meat was always well cooked or even overcooked, while vegetables might not have received the same treatment, so vegetables like potato which can create stomach ache if eaten raw in large quantities could lead to this statement.

[7] Dancer, *The Medical Assistant*, p. 277

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