

Diseases and Medical Disabilities of Enslaved Barbadians From the Seventeenth Century to around 1838 Part I

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ABSTRACT

The disease environment, health problems and causes of mortality of enslaved Barbadians are described. Data are derived mainly from documentary sources; also included are bio-archaeological data from analyses of skeletons recovered from Newton Plantation cemetery. Major topics include infectious diseases transmitted from person to person, as well as those contracted through water, soil, and other environmental contaminations, and diseases transmitted by insects, parasites, and other animals; nutritional diseases, including protein energy malnutrition, vitamin deficiencies, anaemia, and geophagy or "dirt eating"; dental pathologies; and lead poisoning, alcoholism, traumas, and other disorders, including psychogenic death or illness caused by beliefs in witchcraft or sorcery.

Enfermedades y Discapacidades Médicas de los Barbadianes Esclavizados, Desde el Siglo Diecisiete Hasta Alrededor de 1838 (Parte I) JS Handler

RESUMEN

Se describe el ambiente de enfermedades, problemas de salud y causas de mortalidad de los barbadenses esclavizados. Los datos proceden de fuentes documentales, e incluyen también datos bio-arqueológicos a partir del análisis de esqueletos recuperados del cementerio de la Plantación Newton. Los asuntos principales incluyen las enfermedades infecciosas transmitidas de persona a persona, así como aquellas contraídas por el agua, el suelo, y otros medios de contaminación ambiental. Asimismo se incluyen enfermedades transmitidas por insectos, parásitos, y animales; enfermedades nutricionales, incluida la malnutrición energético-proteica, las deficiencias de vitaminas, la anemia y la geofagia o el "comer tierra", las patologías dentales, el envenenamiento por plomo, el alcoholismo, los traumas, y otros trastornos, incluyendo la muerte psicogénica o las enfermedades causadas por creencias en la brujería y la hechicería.

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INTRODUCTION

Many of the diseases and ailments that befell enslaved Barbadians also afflicted Whites. Certain problems, however, were almost entirely confined to the enslaved population. Moreover, as a group, enslaved persons, particularly

children, as Governor Parry reported in the late eighteenth century, were "more liable to take diseases from their numbers and general intercourse". Indeed, as in all Caribbean slave societies, infant and child mortality rates were high and life expectancies at birth were low (2). Mortality aside, non-lethal ailments and afflictions could also leave their victims seriously debilitated, and many of the enslaved people also suffered from lingering illness or experienced temporary discomfort or pain. Others were permanently disabled or maimed from one kind or another of accident or disease.

"Along the whole margin of the West Coast of Africa, from St Louis, Senegal, on the north, to Benguela, on the south," wrote a correspondent of the London Times in 1864, "this gigantic range of territory is one cesspool of fever, dysentery, and everything that is deadly and detestable" (3).

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In a relatively unusual vein for a European of this period, the correspondent spoke well of West African peoples, finding them “courteous, thorough men of the world, loth [sic] to shed blood”, but his characterization of their early disease environment was echoed by many European contemporaries, and is readily endorsed by modern scholars.

In his important and pioneering study of the bio-history of Caribbean enslaved people, Kenneth Kiple argues, following other scholars, that West Africans arriving in the New World were “survivors of one of the most formidable disease environments in the world”. Not only did West Africans often suffer from considerable malnutrition and the diseases it caused, but they were also commonly exposed to such infectious diseases as leprosy, scabies, yaws, various skin afflictions, and a variety of parasites and worms; diarrhoea and amoebic dysentery were frequent symptoms of a multitude of infectious and nutritional diseases, and mosquitoes transmitted elephantiasis, sleeping sickness, malaria, and yellow fever. West Africans were also exposed to such easily contagious illnesses as smallpox, diphtheria, whooping cough, measles, mumps, and influenza.

In brief, in Kiple’s words, the “slaves destined for the Americas left behind them a land that had molded them with massive malnutrition on the one hand, and a host of man’s most dangerous diseases on the other” (4).

The plethora of infectious and nutritionally based diseases was greatly increased for the enslaved population during the psychological trauma, inadequate diets, congestion, poor sanitation, and maladies of the so-called Middle Passage. Moreover, the slave trade continued to serve as the main channel through which a multiplicity of diseases found their way into the Caribbean. The general epidemiological conditions that confronted enslaved Barbadians fit into this wider pattern. In fact, the island’s health problems were not fundamentally different from those in many impoverished tropical areas in today’s world. Although modern medicine has eliminated or greatly checked many diseases as well as reduced infant mortality, in another age, of course, the benefits of modern medicine were absent. Still, the tropical environment of Barbados was conducive to the development and spread of organisms that caused infectious disease. These features of the physical environment were amplified for the enslaved population by, for example, their considerably polluted water supplies, generally poor sanitary conditions, and housing and settlement congestion (5).

Famine conditions and persistent malnutrition also reduced resistance to infectious diseases. The vulnerability to infectious disease, in particular, was especially pronounced among infants and small children and was compounded by the unsanitary conditions in which enslaved people lived and prepared and consumed their food.

The Barbadian disease environment may have been somewhat milder than that in some other West Indian territories; nonetheless, enslaved Barbadians shared many problems with those throughout the Caribbean. This article,

however, is particularly concerned with how issues surrounding health and medicine were specifically manifest in the environment of Barbados and particularly among the enslaved people as these are revealed by the primary sources on Barbados.

As with most areas of the social and cultural life of the enslaved people, the documentary materials are sparse and superficial. These common limitations are magnified with respect to health and medicine by the virtual absence of information for the 1600s and early 1700s, and especially by the diagnostic inadequacies, confused definitions, and naiveté of early European medicine and the Caribbean medical literature of the slave period. By modern medical standards many diseases were misdiagnosed, others were unrecognized or unidentified (and thus were not reported or alluded to in the primary sources), and causes of mortality were often stated incorrectly. Thus, it is impossible to identify precisely the range of maladies and illnesses that afflicted enslaved Barbadians or to quantify the frequency of the illnesses from which they suffered. Qualitative impressions are given in the following pages where the data allow, and this article is fundamentally reliant on the written word, with its many errors and ambiguities. Exceptions to this rule are diseases that were identified from physical or bio- anthropological data. These data were derived from analyses of the skeletal remains of a population excavated from the slave cemetery at Newton Plantation in the early 1970s, and they permit some quantification [see below] (6).

Infectious Diseases: Person-to-Person Transmission

The enslaved population was always vulnerable to readily communicable diseases that spread rapidly, the Barbados Council reported in the late 1780s, “owing to the infection being more easily conveyed among a number of people living, as it were, in small towns”. When serious epidemics hit Barbados periodically, some of them severely affected all racial groups, while others seem to have caused proportionately (and numerically) greater fatalities among the enslaved people. The Barbados Council, for example, was certain that the enslaved population was decreasing, and gave as one major reason the “epidemic diseases, which often make great havoc among them”. In a number of cases, the epidemics are not named or described, but references to the high mortality among the enslaved population during these periods indicate the severity of the disease environment (7). A good part of this environment included diseases normally transmitted from person to person, and some of these diseases could be especially fatal to a population that was already weakened by other illness and malnutrition.

Smallpox

“One of the scourges of eighteenth-century life”, smallpox was very common in England and was probably introduced to Africa by Europeans in earlier times (8). However, as the slave trade brought infected Africans to the New World in

greater numbers, West Africa probably became the major provenance of smallpox introduced into the Caribbean. As long as the trade persisted, imported Africans “continued to be a dangerous source” of the disease throughout tropical America (9). Slave traders often knowingly, though not willingly, transported the virus of this highly contagious disease to the New World.

For example, Thomas Phillips, an experienced slaving captain who made trips to Barbados, generalized on how “the Negroes are so incident to the smallpox, that few ships that carry them escape without it, and sometimes it makes vast havoc and destruction among them” (10).

Accompanied by vomiting, high fevers, headaches, severe backaches and other bodily pain, smallpox produces sores that dry into scabs. In the final stage of the disease, the scabs fall off and leave the telltale legacy of smallpox, its pitted scars or pock marks. One either died from the disease or, if it was not fatal, acquired lifetime immunity from it. Smallpox sometimes could be acquired indirectly, for example, if a healthy person came into contact with the pus- or scab-contaminated clothing worn by the corpse of a smallpox victim. However, the vast majority of smallpox victims contracted the disease by inhaling the virus through close personal contact with an infected person. Thus, the slave caravans or coffles, coastal holding stations, forts and barracoons, and the even greater shipboard crowding of the so-called Middle Passage were ideal for this transmission (11).

In early Caribbean history, smallpox was a “terrible killer” throughout the region (12) and Barbados was not exempt from its ravages. As with conditions in the African slave trade and the trans-Atlantic crossing, the disease also spread easily in the crowded and congested conditions that marked community and household life among the enslaved people. This is not to suggest, of course, that these people were the sole victims of smallpox. The disease affected all Barbadians, and there is no evidence that enslaved persons were disproportionately infected compared to Whites. However, because of their population size, the enslaved people doubtless suffered in greater numbers.

In general, smallpox kills about 25 per cent of its victims, but survivors of the disease acquire lifetime immunity (13). In Barbados, newspaper advertisements of enslaved persons who ran away in the 1700s and early 1800s often pointed to an earlier bout with smallpox. They recorded, for example, persons who were “much pitted” or “much scarred” by the disease. [Ironically, having survived smallpox, thus probably making them more valuable to their owners, these persons now bore physical marks that potentially assisted in their capture if they absconded] (14).

Smallpox epidemics may have occurred in Barbados during the seventeenth century when, for example, in the late 1670s and during the 1690s major unnamed epidemics hit the island (15). However, the disease is only identified by name for epidemics that occurred in 1701, 1705, 1709, and pos-

sibly 1714 (16). “Raging distempers” were widespread among the enslaved people in 1716, and in 1722 “an uncommon mortality . . . reigned throughout the island”; these may have been smallpox or typhoid epidemics (17).

Without citing his source, Robert Schomburgk reported a smallpox epidemic in March 1738 that affected 3000 persons. There were other smallpox epidemics in the 1740s and, in general, as Griffith Hughes wrote, referring to the 1730s and 1740s, “we are seldom free from it in some part of the island or other” (18).

Inoculation (that is, variolation) against smallpox greatly reduced fatalities after its introduction during the 1720s or 1730s, but the disease continued to affect Barbados throughout the eighteenth century (19). However, the epidemics were less severe, probably because of inoculation and improved inoculation techniques that were developed in the 1760s, as well as the greater number of survivors with immunity and fewer imported Africans as the slave trade to the island diminished. The so-called Jenner method of vaccination was introduced to Barbados around 1800, and smallpox was all but eliminated as a danger to the island’s black and white populace (20). Barbadians were exposed to the disease in 1819 and several times thereafter during the slave period, but there is no evidence that epidemics took place; and, as elsewhere in the Caribbean, this once dreaded disease had become but a minor disorder (21).

Chicken Pox, Measles, Whooping Cough and Mumps

In the late 1780s, Governor Parry suggested that even though black and white children were vulnerable to the same diseases, “such diseases as children in general are liable to, attack the children of slaves more frequently” (22) yet, the Barbadian sources contain few details on several well-known and very communicable diseases to which young children were especially susceptible.

Hughes first mentioned chicken pox as a disease which “visits this island at set periodical times”. His information came from “a very old and ingenious physician” of Barbados, who reported chicken pox epidemics in 1692–1693, 1711, 1728, 1746–1747 – at approximately eighteen-year intervals. No racial group is mentioned, but all groups were affected. Dr William Hillary also reported, without mentioning racial groups, that in March 1755 “several children had that exanthematous eruption, called the chicken-pox”, and the disease “continued among children” into the following month (23). However, there is a possibility that some or all of these alleged chicken pox epidemics were another disease.

Probably introduced to Africa by early European or Muslim travellers, measles is one of the most easily transmitted childhood diseases. It is a highly contagious virus that can be fatal, especially to malnourished youngsters; actually, measles itself can precipitate severe nutritional disease. It will, however, usually result in lifetime immunity for those who survive it (24). For Barbados, the disease was first mentioned by Hughes as occurring in the 1730s or 1740s, but he

mentions it in a marginal note, next to his description of chicken pox; he is clearly using both words synonymously.

In his comprehensive work on the island's diseases, William Hillary does not seem to mention measles. However, in 1747, the doctor at the Codrington plantations reported that about half of the enslaved people on the plantations "were afflicted with smallpox and measles". According to Kenneth Kiple, some of the early epidemics identified as smallpox actually may have been measles.

In any case, measles was considered a regular killer among the children on Newton Plantation in the late 1700s and early 1800s, and in 1837 Sturge and Harvey learned that "measles and other epidemics" had destroyed a great number of free black children since emancipation (25).

The Barbadian sources only occasionally explicitly mention whooping cough (pertussis). Hillary reported how it "seized many children in this town and island" in 1753, and by 1755 "some few" of them (racial group not mentioned) in the eastern parishes still had the disease. In general, he wrote, whooping-cough "seems to be equally as infectious to children, as either the small-pox or measles". Later in the eighteenth century, a white diarist reported how "hooping cough" had been "extremely severe" among the children of his household (26). In general, whooping cough epidemics were probably more frequent than the sources indicate, and the disease may have been identified under other terms (27). Similarly, James Grainger, the first doctor to write a medical manual for the treatment of enslaved persons in the West Indies, observed that Blacks and Whites were "very subject to an external swelling of the glands of the neck, etc. called the mumps" (28). However, mumps does not appear to have been identified as such in the Barbadian sources, although the disease may have been referred to by another name; in fact, some of the cases that Grainger called mumps may have been diphtheria.

Diphtheria

A highly contagious and frequently lethal infection if not treated, diphtheria is not generally found in the tropics. However, it occasionally occurred in the Caribbean and may have been more common among enslaved children and women. Called "putrid sore throat" in the early sources, (29) diphtheria, whose symptoms include a moderately sore throat, may have occurred in Barbados but, perhaps, was diagnosed under a different name, such as "sore throat".

Sore Throats

Whether of a viral or bacterial origin, sore throats can involve painful neck and throat swellings, but are associated with any number of diseases. In the mid-eighteenth century, Grainger observed that "more Negroes for some years past have perished by sore throats, than by any other disease". Sore throats were given as a cause of death among Newton's children during the late 1700s and early 1800s (30).

From this limited information, the diseases included under the rubric "sore throat" cannot be identified. Sore throats are among the symptoms of measles, mumps, and diphtheria, and are also associated with influenza.

Colds, Influenza, Croup

Enslaved people were commonly afflicted with various contagious diseases that were not necessarily fatal, but which were debilitating. Under certain circumstances, these diseases could develop into illnesses that might prove deadly, especially to the young, the weak or the elderly. Some of these diseases have been mentioned above. Also, enslaved (and white) Barbadians, like persons elsewhere in the region, often experienced "colds" and "coughs"; sometimes the "colds" were probably other infections that were misdiagnosed, especially when they were held responsible for fatalities (31). In 1823, an influenza epidemic in Barbados affected the servile population at Newton. "[A]lthough not fatal, but to infants and very old people," reported the manager, "the greater part" of Newton's servile population were confined "to the hospital". Kiple writes that influenza, with its fever, headache, sore throat, muscular pain, appetite loss, etc., was "occasionally epidemic and harvested many lives" among enslaved West Indians, particularly the children and the elderly (32). It was also one of those diseases that could produce bacterial pneumonia, particularly among the elderly, very young, or people with chronic lung problems.

Croup – an infection of the breathing tract with a distinctive cough – can prove fatal to children. One child death at Newton was attributed to this disease, but the term does not seem to appear in other Barbadian sources that mention diseases among the enslaved population (33). However, croup could have been indicated or implied in discussions of various respiratory disorders or influenza.

Pneumonia and Tuberculosis

The Caribbean enslaved peoples were especially vulnerable to certain lung ailments that were absent in African disease environments; their susceptibility was increased by their congested living quarters and poor nutrition. In a paper delivered at a meeting of a society of Barbadian planters in the early nineteenth century, Dr Caddell, a plantation doctor, observed how enslaved persons on the plantations, debilitated from poor nutrition, often died after having succumbed to "dysentery, pleurisy, catarrhal affections which are annually epidemic in this country". Catarrh was a vague nineteenth-century term that could refer to any one of several respiratory problems while, in this context, "pleurisy" may refer to pneumonia or to tuberculosis of the lining of the lung. Although pneumonia is usually not mentioned in the Barbadian sources on diseases among the enslaved people, its common symptoms of severe chills, high fever, headache, cough and chest pain could easily have been subsumed under other maladies by early European diagnosticians. In modern

times, respiratory diseases have been a chief cause of mortality among the Barbadian working class, and up to the early 1970s pneumonia was still one of the major causes of death for Barbadian children under age five (34).

Yet, because there are several types of pneumonia, it becomes “a hopeless task”, Kiple argues, “to discover precisely what was behind the various pneumonia-like illness that plagued West Indian slaves”; and “causes of death such as ‘fever’, ‘catarrh’, ‘lung abscess’, ‘debility’, and ‘cold’ do as much to conceal pneumonia as they do to reveal it and we can only assume . . . that it was a much more important cause of slave death than the data indicate” (35).

Tuberculosis was another European-introduced disease to which many enslaved persons were highly vulnerable. The major symptoms of the disease may develop slowly and tuberculosis may not be immediately obvious. Its early symptoms, including, for example, listlessness, vague chest pains, and loss of appetite and of weight, occurred in a variety of illnesses that afflicted the enslaved population. Kiple observes that it is difficult to isolate tuberculosis in the primary sources because it was unrecognized by diagnosticians or confused with other diseases. However, he suggests that it was not uncommon among enslaved people, and was frequently “undoubtedly misdiagnosed as leprosy, venereal disease, and dirt eating” (36). When tuberculosis involved extensive swelling of the lymph glands under the arms and around the neck, diagnosticians might have identified it as “scrofula”, an old term for this phase of the disease. However, when the disease progressed into the lungs, its major symptoms would have included frequent coughing up of pus-filled sputum and ultimately blood. Under such circumstances, it might be assumed, tuberculosis was readily observable and, when recognized, was identified as “consumption”.

Tuberculosis by its several early names is not mentioned in the early Barbadian sources (although apparently present) but by the turn of the nineteenth century it may have been more easily diagnosed. “Consumption” and “scrofula” together were considered important causes of death at Newton over 1796–1801 and 1811–1825. Higman independently analyzed cause of death data for Newton and Colleton plantations for the last few decades preceding emancipation. He found that about 12 per cent of the deaths were attributed to tuberculosis. However, it remains uncertain whether the disease was diagnosed correctly and whether it actually was the cause of death in all or most of these cases. Although J. Jackson, a doctor visiting Barbados in the 1860s, learned that tuberculosis was “much more common” among the island’s black population in post-emancipation times than during slavery, his comment reflected more the diagnostic limitations during the slave period than the actual incidence of the disease (37).

Ainhum, Leprosy, Yaws

A number of the diseases discussed above were introduced to Africans by Europeans. However, several quintessential tropical diseases that afflicted enslaved Barbadians were brought to the Caribbean from Africa itself.

Ainhum, a condition unique to Blacks in Caribbean slave societies, was among “several afflictions that mimicked leprosy”, a disease it was often confused with by early Europeans. Ainhum involved “a linear constriction of a toe (especially the little toe), with the constriction eventually amputating the toe” (38). The disease was identified separately from yaws and scabies (see below).

Primary sources usually do not give this disease a special name, but Grainger called it “joint-evil” and described it as a common complaint “confined to the Blacks”. He noted briefly that “joint-evil . . . commonly attacks the toes, the joints of which successively drop off almost without pain, and always without a fever. It stops when it reaches the foot . . . The patients are in all other respects healthy” (39). Judging from Grainger’s description of “joint-evil”, it was ainhum, and it differed from what other early diagnosticians called joint-evil but which actually referred to leprosy. In either event, the “disease of ulcerated toes” was common among enslaved Barbadians, and often incapacitated them from labour; newspaper ads of enslaved persons who ran away sometimes point to this condition when they mention, for example, enslaved persons who were “missing a toe” (40).

Requiring prolonged close contact for transmission, the infamous disease of leprosy was brought from Africa. In Barbados, leprosy seems to have been first reported as such in the 1680s or 1690s, and it was widespread by the 1730s, if not earlier (41). Whites were “not exempted from this dreadful calamity”, but, as elsewhere in the Caribbean, Blacks were its principal victims (42). Richard Towne, writing in the 1720s, gave a relatively extensive description of the disease. He reported that “joint evil” (a common contemporary term for leprosy) frequently occurred among both Creole and African-born Blacks, reducing its victims to a “miserable loathsome life”. Producing widespread skin lesions and causing destruction of facial cartilage, leprosy is not usually lethal, though Towne and others considered it otherwise. By the late 1770s or early 1780s, leprosy seems to have declined (perhaps due to the decreasing slave trade to Barbados), but the disease was still far from rare, and plantation records suggest that it was still fairly common. For example, from three to five of Seawell’s approximately 185 Blacks in the 1790s were identified as lepers, and the disease was considered responsible for eleven Newton deaths from 1796 to 1801 and 1811 to 1825. Leprosy was identified as a major cause of mortality at Newton (43).

However, it is important to emphasize that the leprosy diagnosed at Newton and Seawell may have been confused with something else. Leprosy is rarely fatal, and Kiple points out that white doctors in the Caribbean either used the term

for several illnesses or confounded leprosy with other diseases; in short, "leprosy quickly became a generic term connoting all sorts of illness including those created by New World parasites and nutritional circumstances". Leprosy, Kiple maintains, was not "as widespread among the slaves as physicians believed it to be". He suggests that a variety of infectious and nutritional diseases "could easily have become ulcerated or gangrenous" and may have been called leprosy by contemporary diagnosticians. For example, many of the deaths attributed to leprosy were most likely the nutritional disease called beriberi, while leprosy and yaws were often confused. The third phase of yaws, when "bone lesions are frequent . . . and nodules as well as ulcers erupt on the body", could have suggested leprosy, while leprosy was called yaws in other diagnoses. In general, then, from information in the sources it is often difficult to determine "the extent to which yaws was called leprosy and vice versa" (44).

However much early Caribbean doctors and planters confused leprosy and yaws, both diseases arrived from Africa and were spread by prolonged personal contact, involving skin-to-skin transmission.

Producing ulcerating sores on the body that can eventually lead to bone and tissue destruction, yaws is a highly contagious disease (whose spread, as with similar diseases, was facilitated by congested and unsanitary living conditions) that early diagnosticians considered very common in Barbados and elsewhere in the Caribbean. However, it rarely afflicted Whites (45). In Barbados, yaws was regarded as much more common among the African-born than among Creoles, the latter even getting it "in a milder manner" than the former, and "Free Negroes" were "not more exempt from it than slaves" (46). Yaws could lead to permanent crippling, but was not viewed as a cause of death in Barbados, although elsewhere in the Caribbean deaths among the enslaved population were sometimes attributed to it (47). In Barbados, the disease seems to have decreased over time, probably because fewer Africans were imported and the African-born population was a distinct minority by the end of the eighteenth century (48). Yet, it must be emphasized that what contemporary observers diagnosed as yaws may not have been yaws at all, but any number of diseases, including leprosy, pellagra, or syphilis. Yaws and syphilis, in particular, were often confused by early writers because of the similarity in their physical manifestations (49).

Venereal Diseases

There is little direct documentary evidence for venereal diseases in Barbados (or in other Caribbean slave societies). In the earliest direct reference, Griffith Hughes distinguishes between the "body-yaws" and the "running, or the wet, yaws". Both were very common in Barbados but "unknown in Northern climates". Hughes implies that both diseases afflicted Blacks as well as Whites.

Wet yaws chiefly attacked the joints, particularly the knees and elbows, and was believed to be transmitted from

infected parents to "their unhappy children". Early colonial writers often erroneously assumed that yaws was spread through sexual contact, and also could be inherited (50). However, the superficiality of Hughes's description precludes determining if wet yaws was really an inherited disease. Since he claims it was "unknown in Northern climates" the disease probably was not syphilis. Without describing any symptoms, later writers also suggested that Barbadians were affected by the "venereal taint" or "venereal cases", and give no indication that such cases were unique to Blacks. In fact, in 1790 Walter Pollard, a white Creole, recommended an unnamed herbal medicine that was successfully used in Barbados against skin disorders and venereal disease. This medication, "like many great discoveries originated from the Negroes", he wrote, and he clearly implied that the disease in question was not confined to one racial group (51). However, the sparse detail in the historical sources precludes identification of the disease, and the "venereal taint" in Barbados could easily have included a variety of diseases that were, in fact, non-venereal (52).

Hughes's brief description, quoted above, may fit gonorrhea, one of the most common infectious diseases. Its symptoms include pus flow from the sexual organs, difficulty in urinating, and inflammation of the tendons on the wrists, knees or ankles. Moreover, by the mid-1800s, after emancipation, gonorrhea is documented for Barbados. However, "syphilis in all its forms" was also "exceedingly common", and congenital syphilis, transmitted from an infected mother to her foetus, was identified as one of the causes for the high infant mortality in Barbados during the early twentieth century (53).

Although modern scholars occasionally mention that enslaved people in the Caribbean suffered from venereal diseases, sometimes specifying gonorrhea or syphilis, with one or two exceptions, virtually no details are given. In fact, despite the ambiguity of the historical records, syphilis was not only present among Blacks (and Whites) in Barbados during the slave period but it may also have been more common than can be inferred from those records. The evidence for the assumption of the presence of syphilis in Barbados derives from physical anthropological analysis of the teeth from skeletons of enslaved persons excavated at Newton plantation in the early 1970s. This analysis suggests that close to 10 per cent of Newton's enslaved population suffered from congenital syphilis (transmission from mother to child), and that the disease was a major contributor to adult mortality and disability on the plantation. Since Newton appears to have been a fairly typical Barbadian plantation, it can also be suggested that the disease affected upwards of 10 per cent of the island's enslaved population. Moreover, it must have contributed significantly to infant mortality and morbidity since, for example, congenital syphilis can often result in still births (54).

As with victims of yaws (to which syphilis is closely related but which is much less dangerous), syphilitic in-

dividuals would have initially acquired relatively mild skin lesions which probably would not have been noticed by early medical observers. However, ten or more years after the initial infection about one-third of untreated cases result in more serious effects. These include potentially lethal cardiovascular and neurological problems: aortic aneurysm, insanity and paralysis.

Destructive lesions of the viscera can cause death in late acquired syphilis, and patients also develop other destructive skin and bone lesions that occur in the late stages of yaws. The consequences of untreated congenital syphilis are even more destructive. Before penicillin therapy was introduced around 1950, miscarriage was common, and about a quarter to a half of full-term pregnancies resulted in stillbirths. About 25 per cent of untreated persons died in early infancy. Surviving children frequently became blind, deaf, and mentally deficient. They often developed incapacitating skeletal and soft-tissue deformities and characteristic facial and dental abnormalities. Children infected with syphilis from birth would have experienced sickness, feeding difficulties (for example, children with sores in their mouths are difficult to feed), and the mental and physical handicaps resulting from this disease throughout childhood. A great deal of Newton's high infant mortality probably was caused by congenital syphilis as well, and many of the deaths that Newton's white doctors and managers attributed to consumption, convulsions, dropsy, fever, fits, inflammation, joint-evil, leprosy, marasmus, rheumatism, scrofula, sore throats, and teething could easily include the diverse symptoms of acquired and congenital syphilis (55).

Unidentified Skin Disorders

Written sources often refer to unidentified ailments characterized by leg or body ulcers or sores; for example, serious cases of "sore legs" on one plantation, and, on another, severe "ulcers on their legs", with "many being almost cripples there". John Waller, a surgeon in the British navy, observed many enslaved persons at Bridgetown harbour with "the loathsome marks of a cutaneous disease", perhaps scabies or yaws.

Referring to the West Indies in general, Grainger reported how "ulcers about their ankles and toes" afflicted the enslaved people "too frequently". Whites were also afflicted. However, Grainger concluded, they were less vulnerable because they "generally wear shoes and stockings", implying that such "ulcers" resulted from ground or soil infestations (these infestations probably included chiggers; see below.) Whether or not his explanation was correct, it is clear that infections caused by environmental contamination and poor sanitation formed an extremely significant dimension of the Barbadian disease environment (56).

Infectious Diseases:

Water, Soil, and Other Environmental Contaminations

Diarrhoea and Dysentery

Although Father Labat could not possibly have understood why, when he visited Barbados in 1700 he became convinced that the water "causes numerous illness, which become epidemic among the Negroes". As throughout the Caribbean, diseases intimately related to inferior sanitation and spread through contaminated food or polluted drinking water were major factors in the disease environment of Barbados. Such gastrointestinal disorders as diarrhoea and dysentery (often called "flux" and "bloody flux", respectively) affected all racial groups, particularly during the rainy season, but they especially plagued enslaved persons and poor Whites (57).

Diarrhoea and dysentery, the latter marked by severe pains and frequent watery stools containing mucus and blood, were omnipresent throughout the slave period. Neither was inevitably fatal, but bouts with them, particularly among malnourished young children (who could easily acquire dysentery, for example, through hand-to-mouth contact with the faeces of infected individuals) and the already sick and elderly, could certainly leave people severely weakened. Moreover, since chronic diarrhoea and dysentery produce dehydration and increase nutrient losses, they also make individuals highly vulnerable to other diseases.

Diarrhoea, properly speaking, is not a disease, but a symptom; as such, it could have been symptomatic of any number of disorders or conditions. For example, in the late 1700s William Dickson observed how hunger in Barbados could drive enslaved persons to consume unripe fruits and vegetables, a practice that was believed to cause diarrhoea and other medical problems. Dysentery, however, was considered a serious cause of death and, according to Richard Sheridan, it was "believed to have been by far the most fatal of all slave diseases" (58). It could spread rapidly and result in intestinal haemorrhaging, perforation of the bowels and severe dehydration.

In Barbados, dysentery epidemics occurred with some regularity and could have devastating results. "With what fury this tyrant has raged this last season", wrote a Barbadian doctor in 1744, "and the numbers it has swept from the surface of this small island". "Sickly times again", reported Governor Grenville in 1750, "bloody fluxes prevail fatally here". Dysentery, he wrote, is "a distemper so obstinate and malignant in this country that it is looked upon to be but one degree less dangerous than the [yellow] fever". When dysentery appeared among enslaved plantation workers, observed William Hillary, "it generally became infectious and spread amongst them, so that many more were seized with it". "We have of late lost some of our old people with the flux", wrote the manager of Codrington plantations in 1732; "we have had it pretty severe for about a month . . . I have buried 8 Negroes since Christmas last". During an island-wide epidemic in

1799, “a great many Negroes were lost by dysentery” on Newton and Seawell Plantations, and in 1812, a plantation doctor observed how dysentery is “annually epidemic in this country”. Some unidentified epidemics, such as the “epidemical distemper” that raged for three months in 1770 and affected “many” Whites and Blacks of all ages and sexes, also could have been dysentery (59).

Typhoid and Paratyphoid

The slave period sources for Barbados, as for the Caribbean in general, do not specifically mention, or they inadequately identify, typhoid or paratyphoid (the latter is a variant of the former, caused by a different species of the same bacterium). However, the generally low hygienic level of the enslaved population and particularly their polluted water supplies make it quite likely that both diseases were prominent in Barbados. Kiple has speculated for the Caribbean in general that typhoid and paratyphoid “shared credit with pneumonia for most of the slave ‘fever’ deaths” reported in the early sources, and “a fair portion of slave ‘fevers’ as well as some of their diarrheas and dysenteries, would today have been diagnosed as typhoid”. Nutritional deficiencies also made enslaved persons susceptible to typhoid (60).

The frequency of typhoid or paratyphoid in Barbados was indicated by a plantation manager who reported that “slow fever”, an early name for typhoid, had caused “the great decrease of slaves in 1812”. The frequency is also suggested by J. Jackson, a medical doctor who visited the island in the 1860s and learned that “formerly a low typhoid fever prevailed, with haemorrhage from the bowels and an affection of Peyer’s patches [that is, a type of open sore that can be associated with typhoid], but, of late years, this is less frequent” (61). Symptoms of typhoid include headaches, profound weakness, cough, watery diarrhoea, rash and a high fever.

In fact, as suggested above, some of the unidentified epidemics or “raging distempers” that were so catastrophic to enslaved Barbadians during the eighteenth century were probably water-borne diseases, particularly typhoid and paratyphoid. Other unspecified, albeit widespread, epidemics post-dating the arrival of smallpox vaccination in the early 1800s (thus, probably eliminating smallpox as one of these unidentified epidemics) fell into a similar category. For example, in 1804 the Newton attorney reported that a “great deal of epidemical fever amongst the Negroes . . . has been very prevalent in most parts of the island”, and in 1821 a Methodist missionary wrote that “the Fever has made its appearance . . . and many have been by this painful scourge hurried out of time to eternity”(62).

Tetanus and Neonatal Tetanus

This potentially lethal infection must have been very widespread among enslaved Barbadians, as it was throughout the Caribbean (63). The tetanus bacteria are often present in the intestines of large farm animals such as cattle and horses.

Their manure contains the bacterial poison, where it resides in the upper levels of the soil. The heavy plantation reliance on large animals for traction and fertilizer, combined with the winds that fanned Barbados and dispersed the tetanus bacteria, and the frequent wounds and bare feet of enslaved people, made environmental conditions particularly conducive to tetanus infection.

Hillary observed that enslaved Barbadians were “more subject” to tetanus than Whites, and perceptively noted that the major reason for this vulnerability was because the former went barefoot and were thus “more exposed to such injuries”. Moreover, they were engaged in work that made them “more liable to get such wounds”. In the 1840s Davy learned that during slavery, tetanus was “rife and destructive”, and even in the (post-emancipation) mid-nineteenth century Jackson discovered that the disease was “quite prevalent” (64).

A major killer of enslaved infants, particularly within the first month of birth, was “jaw-falling” or “locked jaw” (as it was often called in Barbados), that is, neonatal tetanus, a major cause of death in other areas of the Caribbean and still a major killer of new-born infants in many parts of the impoverished world. In 1812 a group of Barbadian planters attributed tetanus to the “mismanagement and improper applications to the navel”. They were surely correct in focusing on treatment of the navel as a major cause of neonatal tetanus; it is through a dirty dressing or poor care of the umbilicus that infection occurs and the bacteria enter the body and attack the blood stream or motor nerves. Neonatal tetanus probably accounted for most cases of infant mortality (65).

“Lockjaw” was listed among the causes of deaths at Newton Plantation during the late 1700s and early 1800s, but “fits”, which were independently recorded as causing death in two children, may have been tetanus (or tetany) whose symptoms include painful bodily spasms [as well as headaches and fever] (66). Writers on diseases among enslaved Barbadians in the earlier periods do not generally mention tetanus by name, but it was undoubtedly much more common than is indicated in these early sources.

Infectious Diseases:

Insects, Parasites, and Other Animals

A number of infectious diseases transported by Africans to the New World were caused by parasitic worms and insects, important carriers of infectious diseases in tropical areas. The ravages caused by the mosquito are among the best known. Although such diseases as filariasis (a term that includes elephantiasis) can be spread by the mosquito, the insect has had a much greater impact on human history for its role in yellow fever and malaria.

Yellow Fever and Malaria.

The deadly and easily spread viral infection of yellow fever was common in tropical Africa and, indeed, probably ori-

ginated there. Carried by the *Aedes aegypti* mosquito, yellow fever was a major scourge in the Caribbean for many years. Barbados was not exempt from its havoc; in fact, the island provides what may be the earliest case of a yellow fever epidemic in the Caribbean. During 1647–1648, the disease “raged violently” for several months and ultimately killed thousands, including, perhaps, as many as six thousand Whites (67).

Throughout the early Caribbean, yellow fever was a significant cause of mortality among Whites, and when they contracted the disease it was often fatal. On the other hand, infected Blacks usually suffered only a very mild form of the disease and very rarely died from it (68). Even in modern West African tropical or rain forest areas, “yellow fever is rarely recognized in the indigenous people”, and there is a “steady increase in immunity with age, until in adolescence most people are immune” (69). Aside from 1647–1648, serious yellow fever epidemics hit Barbados in 1671 and (possibly) in 1680; in the 1690s (including the year 1700), several epidemics intermittently subsided and flared up, but overall the disease “raged for several years” and resulted in “thousands” of fatalities. Referring to the 1690s, Oldmixon learned that the “pestilential fever” which had “so infected” Barbados during those years had “carried off above a third part of its inhabitants”. Oldmixon’s mortality estimate cannot be independently verified; yet, the disease clearly caused a tremendous number of deaths, and he implied that these occurred exclusively among Whites. None of the sources mentions fatalities among the enslaved population during these epidemics. Thus, this deadly disease which Africans contributed to the New World environment became, for justifiable reason and with some historical irony, a much feared killer among Whites (70).

Yellow fever epidemics intermittently hit Barbados during the eighteenth century and in 1793 the disease killed “from fifteen to twenty whites” in Bridgetown every day, “and about half that number of blacks and people of colour” (71). This may have been the last major epidemic in Barbados, perhaps because of the fewer number of slave ships arriving from Africa. However, in late 1816 the island, as well as others in the Lesser Antilles, may have experienced another epidemic (72).

For several possible ecological reasons the *Anopheles* mosquito, which carries the easily spread malarial protozoa, did not make any observable impact on Barbados. It was not found breeding on the island until the late 1920s, and in 1927–1928, the island experienced its first malaria epidemic, with over four thousand cases reported in a two-year period. Although malarial patients were in Barbados during the late 1800s and early 1900s, having contracted the disease in neighbouring islands which harboured the *Anopheles* mosquito, Barbados seems to have been malaria-free during the slave period. However, persons with malaria occasionally came to Barbados during slavery, but they, too, evidently acquired the disease in neighbouring islands (73).

Kiple stresses that malarial fevers were often confused with yellow fever by early Caribbean writers, “particularly when their victims hemorrhaged internally” (74). In the very unlikely case that some very early epidemics in Barbados were malaria (75), they nonetheless would have affected Whites much more than Blacks. The genetically determined anomalies of blood cells, such as sickle-cell anaemia, commonly found in populations of African birth or descent, confer a high degree of immunity to malaria, even though the ability of African populations to resist the disease is not absolute. Malaria was traditionally a major cause of mortality among infants and small children in West Africa and still is a major cause of child mortality in the region. Still, enslaved Barbadians, as those elsewhere in the Caribbean, certainly had a higher degree of protection against malarial infection, particularly falciparum malaria, the most lethal of the several types that affect humans. However, African-born persons among the enslaved population were carriers of the disease which, as with yellow fever, was so deadly to Whites (76). Aside from the apparent absence of the *Anopheles* mosquito in Barbados, the relative immunity of Africans and their descendants probably helps explain why the unidentified epidemics with a high incidence of fatalities among the enslaved population reported in the early Barbados sources were not malaria or, for that matter, yellow fever.

Filariasis

Caused by a filarial roundworm, filariasis is spread through the bite of the *Culex* or *Anopheles* mosquito or some other insect. In the West Indies, the vector of filariasis is *Culex fatigans*, “a prolific domestic breeder” in stagnant or greatly polluted water with a high organic content. When Dr George Low visited Barbados in 1901 he found no *Anopheles*, but “myriads” of *Culex* were breeding in a variety of places. When the mosquito draws blood from a person infected with filariasis, it ingests the larvae produced by the adult worm. The mosquito supports the growing larvae and transmits them when it bites its next victim; the larvae enter into the new lymphatic system, developing into adult worms in about a year (77).

A common disease in West Africa, many Africans arriving in the Americas carried filariasis in their blood. However, they appeared healthy because the clinical symptoms of the disease are delayed, sometimes for many years after infection, while the worm matures. Early symptoms of filarial infections might include periodic glandular pain and general malaise. These symptoms, Todd Savitt has written, could persist “over the course of many years” and were sufficiently general that, presumably, early doctors did not readily associate them with a particular disease (78).

There are several manifestations of filariasis. Its most visible and dramatic form takes place in its last stage, often occurring many years after infection. A great swelling occurs, usually in the scrotal or labial areas and the legs. To-

day called elephantiasis, it was this symptom or manifestation that gave rise to the name "Barbados leg".

The island became, as Kiple has noted, "an early endemic focus of filarial infection" in the Caribbean, and the region's first scientific descriptions of elephantiasis were written by doctors in Barbados (79).

The term "Barbados leg" or "Barbadoes disease" seems to have been used mainly by non-Barbadians. Although the term was ultimately adopted in Barbados, Barbadians preferred calling it "Guyana leg"; however, during the slave period it was more apt to be called the "glandular disease" or "fever and ague" (80).

In his Treatise on the Glandular Disease of Barbadoes, Dr James Hendy reported that elephantiasis "was unnoticed" in Barbados until about the 1690s. Francis Briggs, an Irishman, was the first white man in whom it was observed: "it was so uncommon . . . at the time to see a person with these large legs, that this poor man's name was used as a bug-bear to frighten children". However, Hendy adds, "it is not improbable that the Negroes might have been affected with this disease, and their complaints not sufficiently attended to" (81).

Contemporary medical personnel viewed elephantiasis as seldom fatal. By the 1720s, if not earlier, and throughout the eighteenth century, it was not uncommon among the enslaved population, and Blacks were affected more frequently than Whites. However, the disease, observed Dr George Pinckard in the 1790s, "even suffers not the Europeans to escape". He reported that "male and female, young, middle-aged, and old, black and white, are now all subject to its attack; and in walking the streets, the eye is distressed at almost every corner with the appearance of this hideous deformity" (82).

Elephantiasis, however, was not confined to Bridgetown. The disease was distributed throughout the island, though, as Hendy observed, the leeward side was most affected. By the mid-1810s, a British army doctor noted that elephantiasis continued to be "not uncommon among the native inhabitants", adding that the disease was "more common in Barbados than in most other of the tropical islands" (83).

Reports conflict somewhat on the incidence of elephantiasis over subsequent years. Just prior to emancipation, Orderson, a white Creole, maintained that it "now is scarcely known amongst us", while a British army physician, admitting that elephantiasis was far more common in earlier periods, reported, "Still we cannot walk half a mile without seeing some cases of it." The disease probably diminished in Barbados because of the decline in the slave trade and the many fewer Africans coming to the island to reinforce the infection. In the mid-1840s, Dr Bovell observed that elephantiasis was "scarcely seen among the rising generation". Yet, an American doctor learned perhaps with some exaggeration that in the 1860s the disease was still "quite as common as it ever was" and continued primarily to affect

poor Blacks. Around 1900, Low reported, there was still a "large amount of filarial disease" of one kind or another in Barbados, and both Blacks and Whites were infected (84).

Chigoes, Lice, Scabies Mite

Other insects also transmitted infections which could result in irritating skin diseases as well as in more dangerous pathologies such as gangrene and tetanus. Commonly called in English the chigger, jigger or chigoe, *Tunga penetrans* is a tropical flea native to Central and South America from where it spread to Asia and Africa. Europeans were troubled by this insect from their earliest arrival in the Caribbean, and chiggers afflicted Barbadians throughout the slave period and well into modern times (85). Although Whites were vulnerable to this minuscule insect, it was, Hughes reported, "troublesome chiefly to Negroes, and particularly to such Negroes as are brought hither from Guiney" (86). The usual lack of foot covering or shoes among Blacks (and poor Whites) made them especially susceptible, and chiggers, wrote an eighteenth-century planter, "sometimes infest Negroes beyond their own power to destroy them". Many people bore the marks of their infestation (87).

Invading the skin through the feet or toes, chiggers generally laid their eggs between the toes or under the toe nail. Their presence usually would be discovered by a moderate itching and "afterwards with a throbbing itching pain" (88). Although occasionally a "cataplasm of the newly-extracted juice" of a local shrub was used to kill chiggers, the most common method involved extracting the egg sac with a pointed pen knife or large needle. However, a planter reported, when chigger infestations were very great, even "the pen-knife is seldom effectual to pick them out of the flesh" (89).

Aside from considerable itching and "much smarting pain", chigger-transmitted infections could result in festering sores and serious, sometimes incapacitating, lameness in the feet. But the chigger was often a pathfinder for tetanus and other infections and throughout the Caribbean it was, Kiple conjectures, probably "responsible for much mortality". Moreover, the unsanitary procedures employed to remove chiggers most likely increased the patient's vulnerability to tetanus (90).

C In his treatise on disease in Barbados, Hillary reported on "a sort of itch, which the Negroes call in their language crocrow". He did not describe "crocrow", but implied that it was contagious and common among the enslaved people. Grainger also reported that "a species of itch which Negroes from Guinea often bring with them to the West Indies . . . they call the Crakras. It chiefly infects the ankles, and often, if scratched or neglected, produces inveterate ulcers." Crocrow (or crakras, crawl-crawl), today known as scabies (also, psora), was carried on slave ships, and is generally widespread in the tropics. The disease is communicated by close contact and is transmitted by the scabies (or itch) mite which burrows into the skin. Producing lesions on the hands

or thighs, scabies also causes intense itching, which can lead to skin damage from scratching and thus make the injured person vulnerable to other infections. Early doctors sometimes confused scabies with yaws or leprosy (91).

Lice were another potential carrier of disease, but there is little information. Strolling through Bridgetown in 1796, Pinckard was appalled at seeing “pairs of Negroes, of both sexes, sitting and lying about with their heads in each other’s laps, picking out the swarms of vermin” infesting their hair. He learned that this activity was also very common on the slave ships. Another visitor to Barbados even gave the removal of “vermin” as a reason why enslaved people bathed so frequently [see also, below] (92). However, bathing, particularly in plantation ponds, was another source of danger for it exposed them to water-borne bacteria and viruses, as well as certain worms.

Parasitic Worms

A number of West African parasitic worms also infested the enslaved Caribbean population. These worms most certainly produced considerable damage to an already malnourished and hungry population. They robbed enslaved persons of badly needed nutrients, thus exacerbating an already precarious existence. In the Caribbean, as in West Africa, children bore the brunt of such parasitic diseases.

In fact, Kiple writes, “in regions where kwashiorkor is prevalent, deaths are frequently attributed to diarrhea or worms and these two causes of death seem to have accounted for the bulk of the deaths of the slave young who had not perished as infants” (93). As with several other diseases, worm infestations were caused by contact with water and food that had been contaminated by human faeces or infected soils.

The Guinea worm (*Dracunculus medinensis*) particularly attracted the attention of European observers in the Caribbean, not only because it was so common among the enslaved population but also, perhaps, because of its dramatic appearance – sometimes approaching several feet in length. Brought to Barbados from West Africa, all Barbadian sources agree that Guinea worms chiefly afflicted African-born persons among the enslaved population, and were almost never found among the Barbadian-born; they “seldom or never” occurred among Whites (94). These “exceedingly long” worms “generally bred in ponds of stagnant fresh waters”, and burrowed into the legs of their victims (95). The worms lived under the skin’s surface, usually in the lower leg. Their eggs would develop into a blister that could burst when the leg was immersed in water while the infected person was bathing or swimming. The open blister discharged the larvae into the water, and the larvae, in turn, renewed the cycle by invading those who drank the water or otherwise came into contact with it. It is worth stressing again that enslaved Barbadians frequently bathed in the plantation ponds which were also their main sources of cooking and drinking water (96).

Although the Guinea worm could produce prominent swellings, contemporaries concluded that it “very rarely, if ever, proves mortal”, and the worms were easily removed. However, aside from blisters with burning sensations, their presence could cause such symptoms as nausea, diarrhoea, and vomiting. Judging by the dates of the sources that reported on them, the frequency of Guinea-worm infestations on Barbadian plantations decreased over time, probably with the reduction of arrivals of enslaved persons from Africa. In any case, Guinea worms are not mentioned beyond the late 1780s, and even then they apparently were entirely confined to the African-born (97).

Intestinal worms were also common. While they infested all age groups, Barbadian conditions “prone all children to breed worms”, observed Joshua Steele, a late eighteenth-century planter. Small children, particularly in the post-weaning stage, were singularly afflicted with worms, considered by doctors and planters a major cause of their frequent intestinal pains, dirt-eating and mortality (98). Intestinal worms are not identified or described in the Barbadian sources, but several types afflicted enslaved Caribbean people in general, and were, Kiple notes, “active in creating a fair share of the bowel and lung complaints so frequently registered by the slaves” (99). Most, if not all, of these worms were probably present in Barbados. The trichuris worm, for example, causes trichuriasis, a condition still observed among malnourished children on the island in the 1960s. Trichuriasis infection usually has no symptoms, but when infestation is severe, it can cause nausea, intestinal pains, diarrhoea and occasionally anaemia (100).

Hookworm was another widespread roundworm from Africa. Its larvae usually enter the body through the feet, and in the Americas the hookworm commonly attacked both Blacks and Whites who customarily went barefoot. The conditions in Barbados during the slave period (including the favourable habitat provided by the cane fields) certainly were conducive to hookworm; in fact, it was one of several diseases that commonly afflicted Barbadian children in the early twentieth century. However, as Kiple has stressed, “one must distinguish between hookworm infection and hookworm disease”. Although hookworm infection was “probably widespread” among enslaved persons who could be “carriers” of the hookworm, they were relatively more immune than Whites; the disease itself only “troubled some”, and “was probably not a major factor in damaging black health” during the period of slavery (101).

Other Animal-borne Diseases and Ailments

There is little information on the impact of other animals on the Barbadian human disease environment. Whatever the impact, however, there is no suggestion that enslaved persons were disproportionately affected. Flies could have continually transmitted amoebae and viruses, and there are some indications that centipedes not uncommonly injected their

very painful poisons. Scorpions and poisonous spiders could have done the same, and the occasional bites of infected dogs produced rabies (hydrophobia) fatalities in Blacks and Whites alike (102). Perhaps the raccoons once living on the island and the bats inhabiting its caves even played a role in transmitting rabies, and Barbados's monkeys may have contributed to the seventeenth- and eighteenth-century yellow fever epidemics. Similarly, rats were a major pest in Barbados throughout the slave period, but it is difficult to determine their role in the human disease environment. People may have suffered painful bites from time to time, and rats, as with flies, could have been responsible for a continual transmission of amoebae and viruses, including the spread of diarrhoea and dysentery. In addition, some people may have acquired leptospirosis, an infection transmitted in the urine of infected animals, including bats, rats, and raccoons. The symptoms may include jaundice, fever, headaches and muscular pain (103).

Typhus is usually associated with cold climates and is not normally considered a tropical disease, but lice could have carried typhus to humans from infected rats. Perhaps the transmission among the enslaved population took place with the sharing of the woollen caps and jackets issued by plantations as clothing rations. In what appears to be a unique reference, a plantation manager reported that on his plantation in 1811, "the cause of the great decrease" of the enslaved population was "putrid fever". The Oxford English Dictionary identifies putrid fever as typhus. Until the mid-1800s, Kiple writes, West Indian physicians, "who saw much typhus among military personnel and presumably much typhoid among the slaves, made little effort to disentangle those fevers from the bundle of fevers tormenting the whole of the Caribbean basin" (104). In all, typhus may have existed in Barbados, and more commonly than the primary sources directly indicate.

In general, then, enslaved persons suffered a wide variety of infectious diseases. Many of these diseases were highly contagious and were easily spread under the unsanitary and congested living conditions of the slaves. The susceptibility to infectious disease was greatly increased by their general debilitation, resulting from frequent undernutrition and omnipresent malnutrition. Thus, in slave pathologies, as among all human populations, infectious and nutritional diseases were often closely linked.

(To be continued in Part II.)

NOTES

1. In attempting to clarify medical issues and translate the diagnoses and symptoms given in the early primary sources into modern medical terms, as well as inferring a variety of diseases not mentioned in these sources, I rely greatly on Kenneth F. Kiple's seminal *The Caribbean Slave: A Biological History* (Cambridge: Cambridge University Press, 1984). In addition, various medical texts and modern encyclopaedias, including Kiple's edited volume, *The Cambridge Historical Dictionary of Disease* (Cambridge: Cambridge University Press, 2003) have been used extensively. I have also benefited from discussions with Kiple and his generous advice and suggestions on various drafts. Barbara Ogur,

MD, and Henry Vaillant, MD, graciously read earlier draft materials and were particularly helpful in clarifying a variety of issues. Michael Clarke, MD, also gave early assistance in the identification of some diseases. Needless to say, these individuals bear no responsibility for the errors I may have made. I also thank Ken Bilby, Erika Day, and JoAnn Jacoby for their help with various research issues.

2. David Parry, Replies to Queries, in "Report of the Lords of the Committee of Council . . . Concerning the Present State of the Trade to Africa", Parliamentary Papers 26 (London, 1789), part 3. Abundant literary evidence from Barbados reflects the wider Caribbean pattern of the vulnerability of small children and infants, particularly in their first month (e.g., Godwyn Morgan, *The Negro's and Indians Advocate* [London, 1680], 84; Edward Littleton, *The Groans of the Plantations* [London, 1689], 1920; Griffith Hughes, *The Natural History of Barbados* [London, 1750], 14; Barbados Assembly, *Barbadoes: Report of a Committee of the General Assembly upon the Several Heads of Enquiry &c. Relative to the Slave Trade* [London, 1790], 45; Raymond Richards Collection of Miscellaneous Historical Documents, University of Keele Library [Staffordshire, England], "Minute Book of the Society for the Improvement of West India Plantership, 1811-1812 and of the Agricultural Society, 1812-1816" [1 June 1811-6 April 1816], 128-34; Letter from Taylor, 1 August 1833, in United Brethren, *Periodical Accounts Relating to the Missions of the Church of the United Brethren* [London, 1832], 473).

Although infant mortality rates were very high, their magnitude cannot be determined precisely. Higman estimates that in 1817 the rates for the Eastern Caribbean British colonies, including Barbados, may have been typically "in excess of 400 per 1,000" live births; during the seventeenth and eighteenth centuries it was probably even higher. Kiple estimates the rate for the Caribbean plantations as a whole at around 500. In Barbados, Newton Plantation records for a thirty-four-year period in the late eighteenth and early nineteenth centuries indicate a child (five years and under) mortality rate of about 371 per 1000. Although there are no data on infants (under one year), their rate was undoubtedly much greater. This rate is also suggested by the mid-eighteenth-century records for the Codrington Plantations which indicate a mortality within the first three years of life of over 500 (Barry W. Higman, *Slave Populations of the British Caribbean, 1807-1834* [Baltimore: The Johns Hopkins University Press, 1984], 318; Kiple, *Caribbean Slave*, 113, 234n64; Jerome S. Handler and Frederick W. Lange, *Plantation Slavery in Barbados: An Archaeological and Historical Investigation* [Cambridge: Harvard University Press, 1978], 286; J. Harry Bennett, *Bondsmen and Bishops: Slavery and Apprenticeship on the Codrington Plantations of Barbados, 1710-1838* [Berkeley and Los Angeles: University of California Press, 1958], 55; Mary Butler, "Mortality and Labour on the Codrington Estates, Barbados", *Journal of Caribbean History* 19 [1984]: 48-67).

To put these figures into a comparative framework, over the five-year period 1919-1923, when the material conditions and standard of living for the Barbadian working class were much closer to the slave period than they are today, the infant mortality rate averaged 296. The rate continued to drop over the years; by the early 1950s, it averaged about 133, by the late 1950s and early 1960s, about 66, and with a greatly improved medical delivery system in the post-colonial period, by 1980 it had been reduced to an estimated 22; in 2000-2003, it was around 12 (Colonial Reports - Annual. No. 1225. Barbados. Report for 1923-24 [London: His Majesty's Stationary Office, 1924]; Colonial Office, Barbados, Report for the Years 1954 and 1955 [London: Her Majesty's Stationary Office, 1957]; Barbados Government, Barbados, Report for the Years 1962 and 1963 [Barbados: Government Printing Office, 1965]; United Nations Common Data Base [<http://unstats.un.org/>]; UNICEF [<http://www.unicef.org/>]).

3. W. Winwood Reade, Letter to the Editor of *The Times* (London), 23 June 1864.
4. Kiple, *Caribbean Slave*, 13, 37, 53, 61, 75; see also Gerald Hartwig and K. David Patterson, "The Disease Factor: An Introductory Overview", in Hartwig and Patterson, eds., *Disease in African History* (Durham, NC: Duke University Press, 1978). For a summary of Africa's role in

- the New World disease environment, see also Philip D. Curtin, "Disease Exchange Across the Tropical Atlantic", *History and Philosophy of the Life Sciences* 15 (1993): 329-35.
5. Jerome S. Handler, "Plantation Slave Settlements in Barbados, 1650s-1834", in Alvin O. Thompson, ed., *In the Shadow of the Plantation: Caribbean History and Legacy* (Kingston: Ian Randle Publishers, 2002), 121-58.
 6. Handler and Lange, *passim*; R.S. Corruccini, J. Handler, R. Mutaw, F.W. Lange, "The Osteology of a Slave Burial Population from Barbados, West Indies", *American Journal of Physical Anthropology* 59 (1982): 443-59; Jerome Handler and R.S. Corruccini, "Plantation Slave Life in Barbados: A Physical Anthropological Analysis", *Journal of Interdisciplinary History* 14 (1983): 65-90.
 7. Barbados Council, Replies to Queries, in "Report of the Lords of the Committee of Council . . . Concerning the Present State of the Trade to Africa", *Parliamentary Papers* 26 (London, 1789), part 3; see also, for example, Littleton, *Groans*, 20; University of London Library, MS. 523/593 (Newton Estate Papers; hereafter NEP 523), Farrell to Lane, 29 November 1804; Methodist Missionary Society Archives, Box 1821-1822, no. 250, Shrewsbury to Society, 10 January 1821. On the slave settlements as small "towns" or villages/hamlets, see Handler, "Slave Settlements". Cholera was absent from Barbados until a major epidemic hit the island in 1854.
 8. C.C. Booth, "William Hillary: A Pupil of Boerhaave", *Medical History* 7 (1963): 297; Dorothy Porter and Roy Porter, *Patient's Progress: Doctors and Doctoring in Eighteenth-Century England* (Cambridge: Polity Press, 1989), 4-5.
 9. Donald R. Hopkins, *Princes and Peasants: Smallpox in History* (University of Chicago Press, 1983), 172, 221; cf. Dauril Alden and Joseph C. Miller, "Unwanted Cargoes: the Origins and Dissemination of Smallpox via the Slave Trade from Africa to Brazil, c. 1560-1830", in Kenneth F. Kiple, ed., *The African Exchange* (Durham: Duke University Press, 1988), 35-109.
 10. Thomas Phillips, "A Journal of a Voyage Made in the Hannibal of London, ann. 1693, 1694, from England, to . . . Barbadoes", in A. Churchill, ed., *A Collection of Voyages and Travels*, 6 vols. (London, 1746), 6: 253.
 11. For example, Hopkins, *Princes and Peasants*, 3, 172; Alden and Miller, "Unwanted Cargoes", 39-40.
 12. Kiple, *Caribbean Slave*, 144.
 13. For example, Hopkins, *Princes and Peasants*, 6.
 14. See, for example, Barbados Mercury 1783-1805, *passim*; Jerome S. Handler, "Escaping Slavery in a Caribbean Plantation Society: Marronage in Barbados, 1650s-1830s", *New West Indian Guide*, 71 (1997): 183-225.
 15. Atkins to Lords of Trade, 26 October 1680, in *Calendar of State Papers - Colonial Series, 1677-1680* (hereafter, CSP-CS), 618; John Oldmixon, *The British Empire in America*, 2 vols. (London, 1741), 2: 117.
 16. Minutes of Council of the Massachusetts Bay, 6 March 1701, in CSP-CS (1701), 112; Massachusetts Historical Society, Thomas Prince, "Journal of a Voiage from New England . . . to Barbados", 26 May 1709; Boston Public Library, MS. U.1.14, vol. 1, no. 11, Samuel Chace to Benjamin Wright, 24 April 1705; *ibid.*, no. 13, John Oxley to Hannah Fishbourn, 1714.
 17. United Society for the Propagation of the Gospel in Foreign Parts, "Barbados Journal", 172, John Smalridge to Society, 18 May 1716; Society of Friends (London), *Epistles Received*, vol. 2, fol. 319 (Epistle from Barbados), January 1722.
 18. Robert Schomburgk, *The History of Barbados* (London: Brown, Green and Longmans, 1848), 85; Bennett, *Bondsmen and Bishops*, 56; Hughes, *Natural History*, 39.
 19. For example, William Dickson, *Letters on Slavery* (London, 1789), 154; Thomas Mante, *The History of the Late War in North-America, and the Islands of the West Indies* (London, 1772), 163-65. Some enslaved persons may have independently inoculated themselves earlier, without Europeans being aware of it. Direct evidence is lacking for this practice in Barbados or other West Indian areas, but inoculation against smallpox existed in various parts of West Africa in pre-colonial and early colonial times (see T. Edward Bowdich, *Mission from Cape Coast Castle to Ashantee* [London: J. Murray, 1819], 409; Jean Baptiste Durand, *A Voyage to Senegal* [London: Printed for R. Phillips, 1806], 136).
 20. In March 1802 a Barbadian planter residing in England learned that vaccination, "a discovery so highly beneficial to mankind", had been "introduced in the West Indies and Barbados particularly" (West India Committee, Alleyne Letters, John Foster Alleyne to Richard Smith, 17 March 1802).
 21. Richard Sheridan, *Doctors and Slaves* (Cambridge: Cambridge University Press, 1985), 267; Higman, *Slave Populations*, 280, 334; Alfred W. Crosby, "Smallpox", in Kiple, *Historical Dictionary*, 300-4.
 22. Parry, *Replies to Queries*; Barbados Assembly, Report of a Committee of the General Assembly, 4.
 23. Hughes, *Natural History*, 39; William Hillary, *Observations on the Changes of the Air and the Concomitant Epidemical Diseases in the Island of Barbados* (London, 1766; orig. pub. 1759), 74-75. Hillary, a Quaker physician, practised medicine in Barbados for twelve years, from 1747 to 1759, and his experiences on the island led him to write one of the more celebrated early works on West Indian diseases; it is also one of the earliest treatises by an English doctor that specifically treats tropical diseases. However, Hillary was primarily interested in diseases that affected Whites, and rarely specifically mentions enslaved people (Booth, "William Hillary"; cf. E.M. Shilstone, "The Washingtons and their Doctors in Barbados", *Journal of the Barbados Museum and Historical Society* [hereafter, JBMHS] 20 [1953]: 71-80; Sheridan, *Doctors and Slaves*, 22-24).
 24. For example, Frank C. Ramsey, *Protein-Energy Malnutrition in Barbados* (New York: Josiah Macy Jr. Foundation, 1979), 153-54.
 25. Hughes, *Natural History*, 39; Hillary, *Observations*, *passim*; Bennett, *Bondsmen and Bishops*, 56; Kiple, *Caribbean Slave*, 132, 193n14; Handler and Lange, *Plantation Slavery*, 98-99; Joseph Sturge and Thomas Harvey, *The West Indies in 1837* (London: Hamilton, Adams and Co., 1838), 3.
 26. Hillary, *Observations*, 45, 74; James C. Brandow, ed., "Diary of Joseph Senhouse" [1776-1778], JBMHS 37 (1986): 398.
 27. Kiple, *Caribbean Slave*, 131-32; cf. Higman, *Slave Populations*, 344; Sheridan, *Doctors and Slaves*, 213.
 28. James Grainger, *An Essay on the More Common West India Diseases* (London, 1764), 41; Sheridan, *Doctors and Slaves*, 28.
 29. Kiple, *Caribbean Slave*, 132.
 30. Grainger, *Common West India Diseases*, 40; Handler and Lange, *Plantation Slavery*, 99.
 31. Richard Towne, *A Treatise of the Diseases Most Frequent in the West Indies* (London, 1726), 100-101; Abraham Mason, "Extract of a Letter to the Rev. Thomas Birch, Relating to . . . an Epidemical Disorder", *Philosophical Transactions of the Royal Society* 52 (1764): 477-78; Grainger, *Common West India Diseases*, 20; Seale Yearwood, *Letters to A. Frere*, March 1796 and 26 April 1797, JBMHS 16 (1949): 15; NEP 523/899, Reece to Lane, 31 July 1823; Richard Ligon, *A True and Exact History of the Iland of Barbados* (London, 1657), 93; Handler and Lange, *Plantation Slavery*, 99.
 32. NEP 523/899, Reece to Lane, 31 July 1823; Kiple, *Caribbean Slave*, 144.
 33. Handler and Lange, *Plantation Slavery*, 99. Croup could refer to several respiratory diseases. It was also a manifestation of diphtheria, although its presence in the West Indies, including Barbados, is difficult to discern from the primary sources (Kiple, *Caribbean Slave*, 132; cf. James D. Cherry, "Croup", in Kiple, *Historical Dictionary*, 81-83; Carmichael, in *ibid.*, 94-96).
 34. Dr Caddell, Report on the Health of Barbados Slaves, Meeting of 14 November 1812, in "Minute Book of the Society for the Improvement of West India Plantership", 104; Kiple, *Caribbean Slave*, 113-21, 143-44; Ramsey, *Protein-Energy Malnutrition*, 105. After independence in 1966, conditions improved greatly: between 1966 and 1996 deaths from pneumonia and influenza "decreased more than threefold" (E.R. Walrond, "Health in Barbados 1966-1996", in Trevor A. Carmichael, ed., *Barbados: Thirty Years of Independence* [Kingston: Ian Randle Publishers, 1996], 75).

35. Kiple, *Caribbean Slave*, 21, 143–44.
36. *Ibid.*, 141, 142.
37. Handler and Lange, *Plantation Slavery*, 99; Higman, *Slave Populations*, 341; J.B.S. Jackson, “Diseases of the Island of Barbadoes”, *Boston Medical and Surgical Journal* 76 (1867): 448.
38. Kiple, *Caribbean Slave*, 136; cf. P.E.C. Manson-Bahr and F.I.C. Apted, eds., *Manson’s Tropical Diseases* (18th ed., London: English Language Book Society, 1982), 18–19.
39. Grainger, *Common West India Diseases*, 54, 66–67.
40. “Minute Book of the Society for the Improvement of West India Plantership”, 128–34; Yearwood, *Letters to A. Frere*, 113; Barbados Mercury, 1783–1819, *passim*.
41. Referring to the 1730s and 1740s, Hughes reported that leprosy first appeared in Barbados “about sixty years ago”, and that “it hath spread very much within these twenty years” (*Natural History*, 40).
42. *Ibid.*; Grainger, *Common West India Diseases*, 53; see also Hillary, *Observations*, 324; James Hendy, *A Treatise on the Glandular Disease of Barbados* (London, 1784), 43; Kiple, *Caribbean Slave*, 21, 136.
43. Towne, *A Treatise of Diseases*, 189–92; see also United Society for the Propagation of the Gospel, *Letter Books*, Series B, vol. 6, no. 132, Codrington Attorneys to W. Morice, 28 May 1779; Hendy, *Glandular Disease*, 43; Parry, *Replies to Queries*; Dickson, *Letters*, 34, 36, 140; NEP 523/276, “List of Negroes on Seawell”, 15 April 1791; Handler and Lange, *Plantation Slavery*, 99.
44. Kiple, *Caribbean Slave*, 136–39, 243n28. For example, during the 1600s and early 1700s leprosy and filarial elephantiasis were frequently confused (B.R. Laurence, “Barbadoes Leg: Filariasis in Barbados, 1625–1900”, *Medical History* 33 [1989]: 483).
45. Hillary, *Observations*, 339–52; Hughes, *Natural History*, 42; David Parry, “Extract of a Letter from Governor Parry to . . . Lord Sydney, August 18, 1788”, *Parliamentary Papers* 26 (London, 1789), 15; John Brathwaite, *Replies to Queries*, in “Report of the Lords of the Committee of Council . . . Concerning the Present State of the Trade to Africa”, *Parliamentary Papers* 26 (London, 1789), part 3; David Mason, “A Descriptive Account of Framboesia or Yaws”, *Edinburgh Medical and Surgical Journal* 35 (1831): 54; cf. Kiple, *Caribbean Slave*, 21, 138–39; Sheridan, *Doctors and Slaves*, 83–88; Curtin, “Disease Exchange”.
46. Parry, “Extract of a Letter”, 15; see also Dickson, *Letters*, 153; Hillary, *Observations*, 341. Modern scholars utilizing primary materials have also emphasized the relative frequency of yaws, particularly among African-born enslaved persons in the Caribbean (Kiple, *Caribbean Slave*, 21, 138–40; Higman, *Slave Populations*, 340–44; Sheridan, *Doctors and Slaves*, 83–88, 201, 214).
47. For example, Dickson, *Letters*, 153; Hillary, *Observations*, 344–45; cf. Higman, *Slave Populations*, 340, 344; Kiple, *Caribbean Slave*, 138; Sheridan, *Doctors and Slaves*, 201, 214.
48. Kiple, *Caribbean Slave*, 21, 139–40; Sheridan, *Doctors and Slaves*, 83, 88, 214. By the late 1780s perhaps as much as 86 per cent of the enslaved population was Creole; by 1817 the number had increased to 93 per cent (Handler and Lange, *Plantation Slavery*, 29).
49. Kiple, *Caribbean Slave*, 138–39; K. Jacobi, D.C. Cook, R.S. Corruccini, and J. Handler, “Congenital Syphilis in the Past: Slaves at Newton Plantation, Barbados, West Indies”, *American Journal of Physical Anthropology* 89 (1992): 145–58.
50. Hughes, *Natural History*, 42.
51. Dickson, *Letters*, 153; Philip Gibbes, *Instructions for the Treatment of Negroes*, etc. (London, 1786; reprinted with additions, London, 1797), 81; Walter Pollard to Lord Hardwicke, 22 November 1790, quoted in Karl Watson, *The Civilized Island: Barbados, A Social History 1750–1816* (Ellerton, Barbados: K. Watson, 1979), 122.
52. See, for example, Jacobi et al., “Congenital Syphilis”; Kiple, *Caribbean Slave*, 243–44n29.
53. J.B.S. Jackson, “Diseases”, 447; also, James Bovell, “Observations on the Climate of Barbadoes . . . with remarks on . . . Barbadoes leg”, *British American Journal of Medical and Physical Science* 4 (1848): 198; Ramsay, *Protein-Energy Malnutrition*, 14. For example, in the late 1920s and early 1930s, 83 to 86 per cent of the deaths attributed to syphilis were of children under three years old (*Colonial Annual Report*, 1927–1928, 1928–1929, 1931–1932).
54. For a detailed technical discussion of the evidence for congenital syphilis and its implications for the health and quality of life of enslaved Barbadians, see Jacobi et al., “Congenital Syphilis”.
55. *Ibid.*; Handler and Lange, *Plantation Slavery*, 99. Congenital syphilis is not mentioned in modern studies of early Caribbean medical issues, and the physical findings at Newton cannot be inferred from the primary documentary sources. However, these findings contribute to a deeper understanding of mortality and morbidity, and offer a hitherto unrecorded pathology among enslaved West Indians. They also provide another example of how physical anthropology and archaeology (bioarchaeology) can contribute to the medical history of enslaved Caribbean people and provide information that is unavailable or limited in written sources. In her recently completed analysis of forty-nine additional skeletons, excavated from Newton cemetery in 1997 and 1998, Kristina Shuler “found no evidence of syphilis in any form” (“Health, History, and Sugar: A Bioarchaeological Study of Enslaved Africans from Newton Plantation, Barbados, West Indies” [PhD diss., Department of Anthropology, Southern Illinois University, Carbondale, 2005], 257).
56. West India Committee, *Alleyne Letters*, John Foster Alleyne to Richard Smith, 6 December 1801; NEP 523/276, “List of Negroes on Seawell”, 15 April 1791; John A. Waller, *A Voyage in the West Indies* (London: Printed for Sir R. Phillips and Co., 1820), 3–4; Grainger, *Common West India Diseases*, 66–67.
57. Neville Connell, ed., “Father Labat’s Visit to Barbados in 1700”, *JBMHS* 24 (1957): 171. See Barbados Assembly, *The Report from a Select Committee of the House of Assembly, Appointed to Inquire into the Origin, Causes and Progress of the Late Insurrection* (London: T. Cadell and W. Davies, 1818), 51; Dickson, *Letters*, 76; Hendy, *Glandular Disease*, 43; Hillary, *Observations*, *passim*; Hughes, *Natural History*, 35; Dale Ingram, *An Essay, on the Nature, Cause and Seat of Dysentery’s* (Barbados, 1744); Towne, *A Treatise of Diseases*, 100–101, 114–15; United Society for the Propagation of the Gospel, *Letter Books*, Series A, vol. 24, p. 288, John Vaughton to SPG, Barbados, 11 August 1732. For water supplies in the plantation settlements, see Handler, “Slave Settlements”, 134–36.
58. Dickson, *Letters*, 7; Sheridan, *Doctors and Slaves*, 209.
59. Ingram, *An Essay*, 49; Huntington Library, STG, Box 25 (no. 15), Henry Grenville to George Grenville, 22 August 1750; Hillary, *Observations*, 118; Vaughton to SPG; Yearwood, 115; NEP 523/423, Wood to Lane, 21 October 1800; “Minute Book of the Society for the Improvement of West India Plantership”, 104; William Sandiford, *An Account of a Late Epidemical Distemper* (London, 1771).
60. Kiple, *Caribbean Slave*, 145, 146; cf. Ramsey, *Protein-Energy Malnutrition*, 12; Charles W. LeBaron and David N. Taylor, “Typhoid Fever”, in Kiple, *Historical Dictionary*, 345–49; Higman, *Slave Populations*, 341.
61. Barbados Assembly, *Report from a Select Committee of the House of Assembly, Appointed to Inquire*, 48; J.B.S. Jackson, “Diseases”, 447. In fact, roughly a century after emancipation, typhoid (that is, enteric fever) was still a major cause of mortality on the island (see, for example, *Colonial Annual Reports* for the period 1920–1939 [London: His Majesty’s Stationary Office]).
62. NEP 523/593, Farrell to Lane, 29 November 1804; *ibid.*, 688, Haynes to Lane, 3 December 1810; Methodist Missionary Society Archives, Box 1821–1822, no. 250.
63. Kiple, *Caribbean Slave*, 120–25; Higman, *Slave Populations*, 344.
64. Hillary, *Observations*, 227; John Davy, *The West Indies, Before and Since Slave Emancipation* (London: W. and F.G. Cash, 1854), 102; J.B.S. Jackson, “Diseases”, 446; cf. Bovell, “Observations on the Climate of Barbadoes”, 113–14, 144.
65. Dickson, *Letters*, 155; Grainger, *Common West India Diseases*, 14–15; Bovell, “Observations on the Climate of Barbadoes”, 144; Society for the Improvement 1811–1816, 138; cf. Kiple, *Caribbean Slave*, 120–25. In fact, neonatal tetanus may have been more common than tetanus (H. Vaillant, personal communication).

66. Handler and Lange, *Plantation Slavery*, 99. Tetany is an infantile nutritional disease that was often confused with neonatal tetanus because of their similar symptoms. Kiple argues that a "significant percentage" of neonatal tetanus in enslaved children was, in fact, probably neonatal tetany, and that it undoubtedly caused many of the deaths that were attributed to tetanus in the early West Indian sources (*Caribbean Slave*, 123–25).
67. British Library, Sloane MSS. 3662, John Scott, [1668], "The Description of Barbados", fols. 54–92; Scottish Record Office, GD 34, William Powrey to Archibald Hay, May 1648; Richard Vines to John Winthrop, 29 April 1648, in Winthrop Papers, vol. 5, 1645–1649 (edited by Allyn Bailey Forbes. Boston: The Massachusetts Historical Society, 1947), 219–20. cf. James Goodyear, "The Sugar Connection: A New Perspective on the History of Yellow Fever", *Bulletin of the History of Medicine* 52 (1978): 5–21; Kiple, *Caribbean Slave*, 165; Curtin, "Disease Exchange", 347–48. The number of deaths among Whites reported in Barbados was probably exaggerated; nonetheless, yellow fever would have affected a significant percentage of the white population.
68. Goodyear, "The Sugar Connection", 7; Kiple, *Caribbean Slave*, 18, 161–65. In fact, Kiple (*ibid.*, 179–80) credibly argues that yellow fever was a major reason for the emigration of Whites from Barbados during the 1600s, along with the more customarily discussed "push factors" stemming from the expansion of the plantation system.
69. Manson-Bahr and Apted, *Manson's Tropical Diseases*, 272. The *Cercopithecus* was one of the African animals susceptible to yellow fever and acted as a repository for the mosquito-borne virus (*ibid.*, 271). The Barbados green monkey (*Cercopithecus aethiops sabaeus*) originally came from the Senegambia region during the seventeenth century, and it may have played a role in the island's yellow fever epidemics (Jean Baulu and Julia Horrocks, *The Green Monkey of Barbados* [Barbados: Letchworth Press, 1984]; see also note 103, below).
70. Oldmixon, *British Empire in America*, 2: 117. In the 1690s in Barbados, yellow fever was called "the new distemper", and later "Kendal's fever", the "pestilential fever", and the "bilious fever" or the "putrid bilious fever"; however, by the 1730s or 1740s it was usually called yellow fever (Hughes, *Natural History*, 37; Hillary, *Observations*, 75). References to yellow fever epidemics in the seventeenth century (including 1700) are in: John Burnyeat, *Journal of the Life and Gospel Labours of John Burnyeat* (London, 1839; orig. pub. in 1691), 194; Alexander Dalrymple, *A Collection of Voyages Chiefly in the Southern Atlantic Ocean* (London, 1775), 61–62; Leo Francis Stock, ed., *Proceedings and Debates of the British Parliaments* [Proceedings, 12 April 1671] (Washington, DC, 1924–1941), 1: 384; *ibid.*, 2: 461–62; CSPCS (1677–1680), 618; *ibid.* (1693–1696), 15, 445; *ibid.* (1700), 228, 265, 404; *ibid.* (1700), 797; Society of Friends (London), *Epistles Received, 1691–1695*, vol. I, fols 161–63, 217–21, 229–30; Phillips, "Journal of a Voyage", 253.
71. Cooper Willyams, *An Account of the Campaign in the West Indies*, in the year 1794 (London, 1796), 9. For other references to yellow fever in the eighteenth century, see Thomas Chalkley, *A Collection of the Works of Thomas Chalkley* (London, 1766); Hughes, *Natural History*, 37; Henry Warren, *A Treatise Concerning the Malignant Fever in Barbados and the Neighboring Islands* (London, 1741); Hillary, *Observations*, 75.
72. August Hirsch, *Handbook of Geographical and Historical Pathology*, 3 vols. (London: New Sydenham Society, 1883–1886), 1: 322–25. The *Aedes* also carries dengue fever. Hirsch reports an 1828 epidemic in Barbados and other islands, but his primary source is unclear. In any event, to this day dengue remains a threat in Barbados (*ibid.*, 1: 63; Walrond, "Health in Barbados", 75–76; cf. Manson-Bahr and Apted, *Manson's Tropical Diseases*, 263; Walter D. Glanze, Kenneth Anderson, and Lois Anderson, eds., *The Mosby Medical Encyclopedia* [New York: New American Library, 1985], 217).
73. Colonial Office, *Annual Reports, 1927–1928, 1928–1929*; George C. Low, "Malarial and Filarial Diseases in Barbadoes, West Indies", *British Medical Journal* 14 (1902): 1472–73; Laurence, "Barbadoes Leg", 483; Hirsch, *Handbook of Geographical and Historical Pathology*, 1: 220; cf. Higman, *Slave Populations*, 341; Kiple, *Caribbean Slave*, 164–65; Sheridan, *Doctors and Slaves*, 24.
74. Kiple, *Caribbean Slave*, 164.
75. Watson is alone among modern scholars in suggesting this, but he provides no evidence (Watson, *The Civilized Island*, 122).
76. Davy, *The West Indies, Before and Since Slave Emancipation*, 85–86. For the implications of the sickle cell trait and its relationship to malarial protection and the relative absence of the disease in Barbados during the slave period, see Kiple, *Caribbean Slave*, 14, 15, 17.
77. K.H. Uttley, "The Mortality and Epidemiology of Filariasis Over the Last Hundred Years in Antigua, British West Indies", *West Indies Medical Journal* 8 (1959): 238–48; Low, "Malarial and Filarial Diseases"; Todd L. Savitt, "Filariasis in the United States", *Journal of the History of Medicine* 32 (1977): 141–42.
78. *Ibid.*, 141; "Filariasis", in Kiple, *Historical Dictionary*, 125–28; Kiple, *Caribbean Slave*, 73–74. The *Culex* could have come to Barbados by sailing ship and survived, for example, in water casks; once established, the island contained optimal breeding conditions for the mosquito (Laurence, "Barbadoes Leg", 487).
79. Kiple, *Caribbean Slave*, 73–74; Hirsch, *Handbook of Geographical and Historical Pathology*, 3: 716; Savitt, "Filariasis in the United States", 142.
80. Andrew Halliday, *The West Indies* (London: J.W. Parker, 1837), 69; Robert Jackson, *A Sketch of the History and Cure of Febrile Diseases*, 2 vols. (London: Baldwin, Craddock and Joy, 1820), 2: 261; J.B.S. Jackson, "Diseases", 446; George Pinckard, *Notes on the West Indies*, 3 vols. (London: Longman, Hurst, Rees and Orme, 1806), 2: 120; Henry Fraser, Sean Carrington, Addington Forde, and John Gilmore, *A-Z of Barbadian Heritage* (Kingston: Heinemann, 1990); Frank A. Collymore, *Notes for a Glossary of Words and Phrases of Barbadian Dialect* (4th ed., rev. and enl. Bridgetown, Barbados: Advocate Co., 1970), 15; Hendy, *Glandular Disease*, v; J.W. Orderson, *Creoleana*; or, *Social and Domestic Scenes and Incidents in Barbados in Days of Yore* (London: Saunders and Otley, 1842), 45–46; Brandow, "Diary of Joseph Senhouse", 398, 412n52.
81. In actual fact, Hendy says the disease was "unnoticed" until about "eighty years ago", but he first made this statement in his 1774 doctoral dissertation (Hendy, *Glandular Disease*, 6–7; see also Jerome Handler, *A Guide to Source Materials for the Study of Barbados History, 1627–1834* [Carbondale: Southern Illinois University Press, 1971], 43).
82. Pinckard, *Notes on the West Indies*, 2: 120, 121; cf. Hendy, *Glandular Disease*, 57, 68; Towne, *A Treatise of Diseases*, 184–88; Brandow, "Diary of Joseph Senhouse", 412n52. For comments on the frequency of the disease and comparisons of its occurrence among Blacks and Whites, see Towne, *A Treatise of Diseases*, 184–88; Hillary, *Observations*, 304–5; Hughes, *Natural History*, 40; Linnean Society of London, Burlington House, Drawer 5a, Alexander Anderson, "An account of the island of Barbadoes", 1785; Orderson, *Creoleana*, 45–46; John Williamson, *Medical and Miscellaneous Observations Relative to the West India Islands*, 2 vols. (Edinburgh: Printed by A. Smellie for the author, 1817), 1: 27.
83. Hendy, *Glandular Disease*, 36–37; Robert Jackson, *A Sketch of the History and Cure of Febrile Diseases*, 261.
84. Orderson, *Creoleana*, 45–46; Halliday, *The West Indies*, 69; Bovell, "Observations of the Climate of Barbadoes", 170; J.B.S. Jackson, "Diseases", 446; Low, "Malarial and Filarial Diseases".
85. Hughes, *Natural History*, 41; R. H. Arnett and R. L. Jacques, Simon and Schuster's *Guide to Insects* (New York: Simon and Schuster, 1981); W. Linsenmaier, *Insects of the World* (New York: McGraw-Hill, 1972); Alfred W. Crosby, *The Columbian Exchange* (Westport, Conn.: Greenwood, 1972), 209.
86. Hughes, *Natural History*, 41–42; see also Ligon, *A True and Exact History*, 65; Pinckard, *Notes on the West Indies*, 2: 62–65; Hendy, *Glandular Disease*, 32.
87. Gibbes, *Instructions for the Treatment of Negroes*, 94; Waller, *A Voyage in the West Indies*, 3–4.
88. Hughes, *Natural History*, 42.

89. *Ibid.*, 15, 124, 144; Hillary, *Observations*, 341; Gibbes, *Instructions for the Treatment of Negroes*, 27; Robert Poole, *The Beneficent Bee* (London, 1753), 237, 277. In 1796, George Pinckard gave a detailed description of how chiggers were extracted, a method not very different from that described by Ligon over a century earlier (Pinckard, *Notes on the West Indies*, 2: 62–65; Ligon, *A True and Exact History*, 65).
90. *Ibid.*; Grainger, *Common West India Diseases*, 18; Kiple, *Caribbean Slave*, 136–37.
91. Hillary, *Observations*, 346; Grainger, *Common West India Diseases*, 19; Kiple, *Caribbean Slave*, 137.
92. Pinckard, *Notes on the West Indies*, 1: 260; Anon., *Authentic History of the English West Indies* (London: Printed for the author, Dean and Munday [printers], 1810), 42.
93. Kiple, *Caribbean Slave*, 62, 131.
94. Hughes, *Natural History*, 41–42; see also Parry, “Extract of a Letter”; Hillary, *Observations*, 319; Towne, *A Treatise of Diseases*, 179–83; James Lind, *An Essay on Diseases Incidental to Europeans in Hot Climates* (4th ed., London, 1788), 53; cf. Kiple, *Caribbean Slave*, 20, 73; D. Maier, “Nineteenth-Century Asante Medical Practices”, *Comparative Studies in Society and History* 21 (1979): 65; Curtin, “Disease Exchange”.
95. Hughes, *Natural History*, 41–42; cf. Alexander Gunkel and Handler, eds., “A Swiss Medical Doctor’s Description of Barbados in 1661: The Account of Felix Christian Spoeri”, *JBMHS* 33 (1969): 14–15; Towne, *A Treatise of Diseases*, 179–83; Hillary, *Observations*, 319.
96. Handler, “Slave Settlements”.
97. Towne, *A Treatise of Diseases*, 179–83; Lind, *An Essay on Diseases*, 53; Hughes, *Natural History*, 41–42; Gunkel and Handler, “A Swiss Medical Doctor’s Description of Barbados”, 14–15; Parry, “Extract of a Letter”.
98. Joshua Steele, “Letters of Philo-Xylon” [1787–1788], in William Dickson, *Mitigation of Slavery in Two Parts* (London: n.p., 1814), 153; Grainger, *Common West India Diseases*, 46; “Minute Book of the Society for the Improvement of West India Plantership”, 119, 128–34; Handler and Lange, *Plantation Slavery*, 99.
99. Kiple, *Caribbean Slave*, 73; cf. Sheridan, *Doctors and Slaves*, 215.
100. Ramsey, *Protein-Energy Malnutrition*, 48; Glanze et al., *Mosby Medical Encyclopedia*.
101. Ramsey, *Protein-Energy Malnutrition*, 15, 17; Kiple, *Caribbean Slave*, 71–72, 101–2.
102. Gunkel and Handler, “A Swiss Medical Doctor’s Description of Barbados”, 10–1; Hillary, *Observations*, 258, 263–4; Hughes, *Natural History*, 33; J.B.S. Jackson, “Diseases”, 446; Schomburgk, *The History of Barbados*, 683.
103. The West African green monkey became a pest not long after its introduction in the seventeenth century and continued to be so throughout the slave period. Although its numbers fluctuated, bounties were offered for its elimination and by the 1830s the monkey population had been significantly reduced. By the 1840s, as Schomburgk noted, monkeys were “nearly extirpated, and only a few remain in the gulleys and deep recesses”. He also observed that the raccoon, which was also introduced in the late seventeenth century, “is now equally scarce”. From the seventeenth century and throughout the slave period (and later), rats were also a scourge and laws were enacted offering bounties for their destruction (see Schomburgk, *ibid.*, 178, 683; Davy, *The West Indies, Before and Since Slave Emancipation*, 138; Richard Hall, *Acts, Passed in the Island of Barbados* [London, 1764], *passim*; Hughes, *Natural History*, 66; Linnean Society of London, *Burlington House, MS. 610*, Alexander Anderson, ‘Barbados’ [ca. 1784–1785], 2; K. Helgen and D. Wilson, “The History of the Raccoons of the West Indies”, *JBMHS*, 48 [2002]: 1–11).
104. Barbados Assembly, Report from a Select Committee of the House of Assembly, Appointed to Inquire, 48; Kiple, *Caribbean Slave*, 145.