

The 1802 Saint-Domingue Yellow Fever Epidemic and the Louisiana Purchase

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Epidemics have been pivotal in the history of the world as exemplified by a yellow fever epidemic in the Caribbean that clearly altered New World geopolitics. By the end of the 18th century, yellow fever—then an “emerging disease”—was widespread throughout the Caribbean and particularly lethal in Saint-Domingue (present day Haiti). From 1793 to 1798, case fatality rates among British troops in the West Indies (including Saint-Domingue) were as high as 70%. A worse fate befell newly arrived French armed forces in 1802, ostensibly sent by Napoleon to suppress a rebellion and to reestablish slavery. Historians have disagreed on why Napoleon initially dispatched nearly 30 000 soldiers and sailors to the island. Evidence suggests the troops were actually an expeditionary force with intentions to invade North America through New Orleans and to establish a major holding in the Mississippi valley. However, lacking knowledge of basic prevention and control measures, mortality from the disease left only a small and shattered fraction of his troops alive, thwarting his secret ambition to colonize and hold French-held lands, which later became better known as the Louisiana Purchase. If an event of the magnitude of France’s experience were to occur in the 21st century, it might also have profound unanticipated consequences.

KEY WORDS: *Aedes*, dengue hemorrhagic fever, epidemics, Haiti, history, 19th century, yellow fever.

● Yellow Fever in the New World

Historians have speculated that New World yellow fever epidemics began in the Caribbean basin in 1647-1648. Carter,¹ a major yellow fever historian, concluded that its origin was West Africa and got imported (along with malaria) as a result of the massive

slave trade. Epidemics raged on the coastal Americas and Caribbean islands for more than 300 years, influencing the political landscape of 5 colonizing European countries. However, the largest recorded yellow fever epidemic with the highest case fatality rate occurred in 1802 in Saint-Domingue (Table 1).² At that time, Saint-Domingue—the western third of the island of *Española* (Spanish)/Hispaniola (English)—had been retaken from England in 1798. The English had occupied the colony since 1793 to suppress slave rebellion and to control buccaneers who had preyed on European ships for more than a century (the Figure). In a 6-year period, Great Britain had experienced more than 100 000 killed or made ill from the disease in their West Indian possessions.³ From 1793 to 1798, case fatality rates among British troops in the West Indies (including Saint-Domingue) were as high as 70%. This devastating experience was a primary reason for their withdrawal, along with their defeat by Haitian revolutionaries, led by General Francois Dominique Toussaint L’Ouverture, who successfully abolished slavery on the island.

● The French Reinvasion of Saint-Domingue and the Epidemic of 1802

Although the French had earlier assisted the Haitians in fighting the British and Spanish and in freeing slaves, Napoleon later resisted Toussaint’s attempt to take full control of the island. With secret intentions of

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TABLE 1 • Major New World Yellow Fever Epidemics

Date	Estimated Duration, mo	Place	Estimated Mortality
1672-1673	24	Cuba	2000
1793	5	Philadelphia, Pennsylvania	5000
1798	4	New York, New York	2100
1802-1803	14	Saint Domingue	29 000-55 000
1853	4	New Orleans, Louisiana	7800
1853	3	Norfolk, Virginia	3000
1873	2	Philadelphia, Pennsylvania	5000
1873	6	Memphis, Tennessee	2000
1878	6	New Orleans, Louisiana	4046
1878	6	Mississippi Valley	13 000

From Kohn²

reoccupying the island and reinstating slavery, in the late fall of 1801, Napoleon sent an initial force under his brother-in-law, General Victor Emmanuel Charles LeClerc, which led to war.⁴ Napoleon's strategic plans were to eventually include a force of 60 000 soldiers and sailors to subdue and co-opt the Haitian military, which numbered less than a militia of 55 000 soldiers and 100 000 irregulars.⁵ The largest fleet France had ever mounted consisted of a total of 86 frigates and ships

of the line carrying 31 131 troops and artilleries from its revolutionary armies, including a 5200-man Polish legion. However, the recent observations by the medical historian, McNeill,⁶ note "considerable confusion surrounds the numbers of French military personnel sent to St. Domingue with totals in the literature ranging from 60,000 to 82,000." Ships landed in 3 different ports in the spring of 1802. Twenty thousand soldiers and sailors followed in later months. (In comparison, 40 000 soldiers, 10 000 sailors, 14 frigates, 13 ships of the line, and 400 transport ships were used in Napoleon's failed 1799 Egyptian campaign.)⁷ After arrival of his troops, LeClerc was faced with fighting a guerrilla war against Toussaint for several months along the coast and immediate inland enclaves but eventually succeeded in restoring trade. Toussaint, faced with increasing defections from his own followers, eventually was tricked by LeClerc into a meeting where he was arrested and exiled to Europe to die in a French jail. But the struggle against the French was taken up by his successor, Jean-Jacques Dessalines. The conflict continued, resulting in a Haitian declaration of independence in 1804.

Within a year of LeClerc's arrival in Haiti, he was faced with a more serious problem than the rebellious

FIGURE • Portion of Map Created by French Explorer Louis Hennepin^a

^aShowing the Louisiana territory and portions of the Caribbean, including the island of Saint-Domingue located immediately east of "I de Cuba" (map originally entitled *Carte de la Nouvelle France et de la Louisiane Nouvellement decouverte*, ca. 1683). Reproduced with permission from the Louisiana State Museum, New Orleans, Louisiana.

Haitians. His troops were succumbing in droves to the most grievous epidemic of yellow fever in history. Forts with garrisoned troops and offshore ships provided suitable environments for mosquito breeding. Estimates of the death toll vary along with estimates of the number of troops sent to Saint-Domingue. McNeill reports that 50 000 to 55 000 (80%-85%) French soldiers died, predominately because of yellow fever with only a few related to combat (along with more than 20 000 deaths among civilians). By any standards, the number of deaths and case fatality rate are difficult to comprehend unless one takes into account a convergence of environmental and ecological factors ideal for an epidemiological disaster. McNeill documented how temperature, rainfall, and ecological changes all favored *Aedes* propagation, and mosquito density and longevity in the Caribbean, all conducive to the spread of yellow fever in the Caribbean between 1620 and 1914.⁶

The epidemic began in the spring of 1802. In April and May of that year, LeClerc wrote to Denis Desclés, the French Minister of Marine:⁸

A man cannot work hard here without risking his life and it is quite impossible for me to remain here for more than six months . . . my health is so wretched that I would consider myself lucky if I could last for that time! The mortality continues and makes fearful ravages. . . . You will see that the army which you calculated at twenty-six thousand men is reduced at this moment to twelve thousand . . . At this moment I have thirty-six hundred men in the hospital. In the last fortnight I have lost thirty to fifty men a day in the colony, and there is no day when two hundred to two hundred and fifty men do not enter the hospital, while no more than fifty come out.

● Factors Contributing to Mortality

There have been previous attempts to explain the high case fatality rate among the French troops and civilians compared with other New World yellow fever epidemics (Table 1). This extraordinary Saint-Domingue figure also exceeds estimated rates for other lethal arthropod-borne diseases (Table 2). The ranges in mortality rates for these diseases are based on a spectrum of historical and contemporary epidemics; the wide ranges suggest that numerous adverse conditions are responsible for these estimates. For example, an inordinately high-case fatality rate for Oroya fever (90%) is attributed to salmonellosis coinfection, whereas the usual, commonly accepted rate for systemic bartonellosis is 40%.⁹ In Saint-Domingue the confluence of the many confined, immunologically naive hosts, a large reservoir of infected individuals, favorable climatic conditions, and the macro- and microenvironments conducive to vector multiplication may have

TABLE 2 ● Arthropod-Borne Disease by Vector and Case Fatality Rate

Disease	Vector	Case Fatality Rate, %
Yellow fever	Mosquito	20-50
Dengue hemorrhagic fever	Mosquito	40-50
Crimean-Congo hemorrhagic fever	Tick	2-50
Epidemic typhus	Louse	10-40
Rocky Mountain spotted fever	Tick	20-80
Systemic bartonellosis (Oroya fever)	Sand fly	10-90
Bubonic plague	Flea	50-60
Malaria	Mosquito	1-20

From Heymann.⁹

been synchronized in such a way as to create the conditions for the epidemic. In addition, an element absent in other yellow fever outbreaks of the era was ongoing warfare and the presence of an opponent with an understanding of how the fevers differentially affected the Europeans, particularly those newly arrived. In addition to being a guerrilla tactician, Toussaint had medical knowledge and an awareness of when and where the fevers would strike his European enemies.⁶ He apparently knew that by maneuvering the whites into the ports and lowlands during the rainy season, they would die in droves. In a letter to Dessalines, he wrote: "Do not forget that while waiting for the rainy season, which will rid us of our enemies, we have only destruction and fire as our weapons."⁶ This observation suggests that Toussaint knew more about the environmental conditions conducive to yellow fever transmission.

● Yellow Fever Endemicity and Epidemicity

The Haitian historian, David Patrick Geggus,⁷ notes that, in the 1780s, an established French town on Saint-Domingue experienced an *overall* annual mortality rate of only 2.86% in its soldiers and 1.85% in sailors. He suggested that the indigenous population and occupying troops had been largely free of endemic disease (primarily malaria and yellow fever) due to an acquired immunity or infrequent contact with infected vectors, or both. In the mid 1700s, epidemics on Saint-Domingue were less frequent; tended to occur during summer months; and, in some years, the population was entirely free of disease. He posed 3 determinants for the subsequent disastrous epidemic during the British occupation. These factors may also be applicable to the French, along with additional considerations.

1. Increased concentrations of confined, recently arrived, nonimmunes.
2. Increased importation of vectors from nearby islands and Africa.

3. Climatic conditions conducive to multiplication of vectors.

As demonstrated by the earlier English occupation, newly arrived European troops—not “seasoned” to the Americas—were perhaps more susceptible to infection, as a consequence of a miserable and unhealthy ocean passage.⁶ They had no time to acclimatize before engaging in fighting in an unfavorable tropical climate. Garrisoned facilities and nearby ships offered suitable confined environments for *Aedes* breeding in fresh water containers. There had to have been close proximity between susceptible troops, mosquitoes, and men suffering from yellow fever, which ensured continuing transmission and escalation of disease. Like the British forces, the French were tightly confined. The ongoing hostilities prevented escape from the disease to *Aedes*-free mountain elevations or nearby countryside, which was a common reaction when yellow fever erupted in American cities that may have decreased estimated overall case fatality rates. In skirmishes along the coast, infected mosquitoes would have also abounded. The importation of additional *Aedes* vectors from other French colonies in the Caribbean or directly from Africa on slave ships is certainly possible.

Geggus suggested an additional contributing factor to the high mortality rate—French medical practices. By 1800, Great Britain had begun to discard antiphlogistic practices, but, in the Caribbean, Britishers had probably used its therapeutic medicine, as did the French who continued to favor this philosophy. One practice in particular—venesection—was advocated by French physicians for most illnesses, even wounds. A most influential medical figure at the time was Francois Joseph Victor Broussais—“the most sanguinary physician in history”—who continued to promote frequent blood letting for most conditions well into the 19th century.¹⁰ From as little as 30 mL to as much as 3 to 6 pt of blood might be rapidly taken from the patient to improve his outcome. This antiphlogistic practice was commonplace in the French West Indies at the time. Bloodletting among sick and injured soldiers, sailors, and civilians suffering from any condition—including yellow fever (a hemorrhagic fever) or malaria (an acute hemolytic disease)—may have also added to the unusually high mortality rates observed among French troops. In addition to bloodletting, French medicine advocated a gastric purgative (calomel), blistering, and a daily bottle of Madeira (or rum) for each soldier to “*comble de la déraison*” induced by fever.¹¹

In addition, dengue fever and dengue hemorrhagic fever—well known to the French as *maladie de Siam*, brought from other Caribbean colonies and Africa—have not been fully considered. According to Gubler,¹² both dengue and dengue hemorrhagic fever may have

been present in the New World as early as 1635 and both were certainly present at the turn of the 18th century. The French colonies in Southeast Asia had experienced a disease compatible with dengue hemorrhagic fever for decades, and its hemorrhagic signs and symptoms resemble yellow fever enough that the 2 diseases may have been indistinguishable at the time.

In the late fall, 1803 the remaining French troops on Saint-Domingue began a withdrawal after suffering the death of most of their forces, including LeClerc and 5 other generals.¹³ In November 1803 Jean-Jacques Dessalines, Toussaint L’Ouverture’s successor, defeated the last French forces at the Battle of Vertières. Two months later on January 1, 1804, he declared independence, naming the new republic Haiti (*Ayiti*, Taino for “land of high mountains”).

● Consequences and Counterfactuals

The epidemic resulted in an alteration of Napoleon’s plan for his Caribbean possessions, and a bolder design on other New World territories. Although the importance of yellow fever throughout the Americas has been well documented by Carter, McNeill, and others, Ackerknecht¹⁴ was one of the first medical historians to propose that it had profound effects in the shaping the early history of the United States.

Perhaps the most important epidemic in history was that of Santo Domingo in 1802. It killed 29,000 of 33,000 soldiers and sailors sent by Napoleon to Santo Domingo with the aim of reconquering that island and thereafter the Mississippi valley. Napoleon might have succeeded in his plans despite the heroic resistance of the Negroes in Haiti, if the yellow fever had not^{*} [*sic*] been nipped in the bud. Had Napoleon succeeded there would have followed a trichotomy of the North American continent into French, Spanish and English regions.

Ackerknecht’s suggestion of an ulterior plan is not mentioned by many historians who focus on the disease alone, or the rebellion itself; some argue that reinstatement of slavery was his sole intent. Thus, Corbett¹¹ offered 2 possible motives for this disastrous French misadventure—a “linear plot theory” (a North American invasion) and the “Saint-Domingue-Center view”; the latter proposed that Napoleon wished only to reestablish a lucrative colony—“the Pearl of the Antilles”—as a cash cow (*vache à lait*) and to reinstitute an *Exclusif* on sugar exportation. However, there is substantial evidence that he had greater ambitions. In a 1934 study of 18th-century French diplomacy in Louisiana, Lyon,¹⁵ cited a June 4, 1802, letter from Napoleon to Decrès that revealed his true

*No doubt, he intended to say “nipped in the bud.”

intentions toward New World territories. His apparent objective at the time was not only to suppress the ongoing slave revolt on the island of Saint-Domingue, but also to prepare for an invasion of the Mississippi valley through New Orleans. With Saint-Domingue under control, Napoleon readied another force in ports along the coast of Holland:

My intention, Citizen Minister, is that we take possession of Louisiana with the shortest possible delay, that this expedition be organized in the greatest secrecy, and that it have the appearance of being directed on St. Domingo. The troops that I intend for it being on the Scheldt, I should like them to depart from Antwerp or Flushing.

France had already begun to prepare the southern Mississippi region against possible aggression by Americans infiltrating the upper valley, knowing that the United States did not possess a significant armed force—only a small coast guard fleet (no warships) and a recently reconstituted army of fewer than 20 000 soldiers. The United States was already involved in the quasi-war with France because its merchant ships transporting sugar to Great Britain were being intercepted. A 1799 letter from Thomas Jefferson to James Madison substantiates a fear that Southern slaves (estimated to be more than half a million) would rebel, assisted by “Caribbean Black sailors” and a French armed force.¹⁶ In addition, Napoleon anticipated that these combined forces would be joined by 20 000 sympathetic, disaffected Native Americans.¹⁷ These Indians living on the east side of the Mississippi—Chickasaws, Choctaws, Alibamons, Creeks, and others—were reported as “devoted” to the French and were to receive gifts that included “4,000 trading muskets, painted yellow with some black flowers and a ferocious beast on the butt end; 1000 (superior) muskets for the chiefs; 150 carbines; 20 000 pounds of powder; 25 000 gun flints; 10 000 ramrods; 10 000 briquets; 5000 pickaxes; 1000 sabres; 5000 tomahawks; 3000 trading razors, 10 000 woolen strips; 1000 muslin shirts for the chiefs; 500 coats of Carcassonne blue cloth; with red collars and cuffs; 500 black handkerchiefs, etc., etc.”¹⁵

Earlier, in 1799, Toussaint had refused to comply with the French Directory’s plan to invade Jamaica and then Louisiana. The plan was put into abeyance for 2 years until Napoleon took power as First Consul in 1801. By that time, he had declared himself governor general for life and the leader of the Republic of Saint-Domingue. Napoleon, ignoring these declarations, dictated a letter to Toussaint suggesting he was readying the plan:⁴

I am instructing the Minister of Marine to forward to you your commission of Captain General of the French part of St. Domingo. The government could hardly offer you greater proof of its confidence in you. Use your influence to the utmost for the maintenance of peace

and the encouragement of agriculture. Train and organize the National Guard and the troops of the line. I hope the time is not far distant when an army from St. Domingo will be able to contribute to the extension of French possessions and glory in your part of the world. I salute you affectionately,

Bonaparte

Remarking on the above the American historian and journalist, Henry Adams, stated:¹⁸

Bonaparte explained the subject in confidential papers, which would not have been secret unless they had expressed his true objects. St. Domingo, like all the West Indies, suffered a serious disadvantage, being dependent for its supplies chiefly on the United States—a dangerous neighbor both by its political example and its commercial or maritime rivalry with the mother country. The First Consul hoped to correct the evil by substituting Louisiana for the United States as the source of supplies for St. Domingo. In case of war, either with the United States or England, St. Domingo and the other French colonies in the West Indies could be safely left to themselves, if Louisiana and perhaps also Florida could be made a certain base of supplies—for the islands had only famine to fear.

Napoleon eventually changed his plans and ordered a separate fleet, assembled in Holland, to be sent directly to Louisiana, possibly to avoid further ravages of disease on Saint-Domingue. For a time, he successfully deceived both American and British observers:

Troops are now going out from some of the northern parts of France for Sto Domingo, with orders to march directly into the mountains and attack the Blacks before the Fever can make much ravage among them. (troops don’t want to go) there was a threat to shoot every 10th man. Their fears of the climate of Sto Dom are natural, for out of the late army of 35,000 men, 32,000 died of the fever. But soldiers here are made to do anything. The country is under a strong military government, which is perhaps the most powerful upon earth. The affairs of this government are transacted in great mystery, compared to that of the US.¹⁹

That force never left Holland due to a delay in obtaining official royal delivery of the lands from Spain (cash-strapped, Spain had no colonial intentions for the area). The order did not arrive until October, after which the English Channel ports became icebound. Great Britain and the United States had become suspicious of the concentration of ships and the British blockaded the ports. By the following spring, the total expenditures for the expeditions had reached 2 000 000 francs (US \$5.5 million in 2012). Napoleon, with grander plans in mind, lost interest in his North America intentions and sold off the territories to the United States in April 1803—the Louisiana Purchase.

● Conclusions

One hundred years before the epidemiology of yellow fever was elucidated by Walter Reed and others, lack of knowledge of basic preventive and control measures in the early 19th century led to one of the largest epidemics of yellow fever in history. Indeed, effective measures were absent (improper isolation and quarantine measures) or counterproductive (venesection); all facilitated transmission of disease and subsequent deaths. Volumes have been written on the historical impact of yellow fever epidemics in North America. (The famous 1793 Philadelphia epidemic was attributed to ships carrying fleeing citizens and mosquitoes from Saint-Domingue.) Scores of other books and articles have been written on the Haitian revolution, focusing on Toussaint L'Ouverture and the heroism of his fellow countrymen, but few authors fully acknowledge the significant contribution of yellow fever to subsequent events. Had Napoleon succeeded, it is certain he would have reinstated slavery; enacted a sugar *Exclusif*, fortified the island; and strengthened his other Caribbean and North American possessions, including the Louisiana territories. As Ackerknecht¹⁴ noted, the epidemic had a pivotal effect on the history of the United States. The once profitable New World colony would have become a jewel in Napoleon's crown—a crown he was to place on his own head in 1804. The Louisiana territories would also have become a major part of the tripartite European hold in North America. The Haitian epidemic was an unanticipated catastrophe that changed Old and New World history.

If a Black Swan event of the magnitude of France's experience were to occur in the 21st century, it might also have unexpected economic and geopolitical consequences. The history of yellow fever has ranged between complete ignorance of prevention and control measures to present day knowledge that may not anticipate future scenarios. A continuing mystery is why the disease has never appeared in Asia and the Indian subcontinent where its mosquito vector is abundant. Innate immunity, stringent immunization requirements, isolation and quarantine measures, and infrequent introduction of the virus do not seem to explain the continuing absence of the disease in these areas. With absolute increases in air travel, international tourism, and favorable climatic conditions, the disease may conceivably be successfully inoculated into the only continent that has been inexplicably free of yellow fever. These factors might also play elsewhere, reestablishing it (and dengue fever) in suitable European, North American,

and Caribbean locales.²⁰ The last chapter on the history of yellow fever may not have been written.

REFERENCES

1. Carter HR. *Yellow Fever. An Epidemiological and Historical Study of its Place of Origin*. Williams and Wilkins, Baltimore; 1931.
2. Kohn GC, ed. *Encyclopedia of Plague and Pestilence: From Ancient Times to the Present*. 3rd ed. New York, NY: Facts on File; 2007.
3. Unknown title. *London Gazette*. 1798.
4. Geggus D. Yellow fever in the 1790s: the British army in occupied Saint Domingue. *Med History*. 1979;23:38-58.
5. Korngold R. *Citizen Toussaint*. Boston, MA: Little Brown and Company; 1944
6. McNeill JR. *Mosquito Empires: Ecology and War in the Greater Caribbean, 1620-1914*. New York, NY: Cambridge University Press; 2010.
7. Wikipedia, the Free Encyclopedia Web site. French campaign in Egypt and Syria. http://en.wikipedia.org/wiki/French_campaign_in_Egypt_and_Syria. Accessed September 18, 2012.
8. Rossier P. *Lettres du Général Leclerc, commandant en chef de l'armée de Saint-Domingue en 1802*. Boston, MA: Bedford-St. Martin's Press; 2006.
9. Heymann DL, ed. *Control of Communicable Disease Manual*. 19th ed. Washington, DC: American Public Health Association; 2008.
10. Castiglioni A, Krumbhaar EB. *A History of Medicine*. 2nd ed. New York, NY: A A Knopf; 1947.
11. Corbett B. The Haitian Revolution, Part IV. Napoleon's West Indian Policy and the Haitian "Gift" to the United States. *Stretch magazine*. September 1991.
12. Gubler DJ. Dengue/dengue haemorrhagic fever: history and current status. *Novartis Found Symp*. 2006;277:3-16; discussion 16-22, 71-73, 251-253.
13. Meziere H. *Le Général Leclerc et l'expédition de Saint-Domingue*. Paris, France: Bibliothèque Napoléonienne Tallandier; 1990
14. Ackerknecht EH. *History and Geography of the Most Important Diseases*. New York, NY: Hafner Press; 1965.
15. Lyon E. *Louisiana in French Diplomacy, 1759-1804*. Norman, OK: University of Oklahoma Press; 1934
16. Dubois L, Garrigus JD. *Slave Revolution in the Caribbean, 1789-1804: a Brief History With Documents*. Boston, MA: Bedford-St. Martin's Press; 2006.
17. Parkinson W. *'This Gilded African': Toussaint L'Ouverture*. London, England: Quartet Books Limited; 1978
18. Adams H. *History of the United States: Jefferson Administrations*. Library of America, 1986. (The New York:1891:124 citation is incomplete and dated).
19. March 15, 1803 letter of Joseph Carrington Cabell to his father, Colonel Nicholas Cabell. Albert and Shirley Small collection, Aldemann Library, University of Virginia.
20. Monath TP. Yellow fever: an update. *Lancet Infect Dis*. 2001;(1):11-20.