REVOLUTIONARY INCIDENTS:
"Exploiting Naturally Occurring Outbreaks of Disease for Military Gain"

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Introduction

"As an expeditionary force, the Army encounters endemic diseases in all areas of the world and operates where the conditions that give rise to emerging disease—globalization, conflict, environmental change—are prevalent. Army forces face adversaries that…are capable of exploiting naturally occurring outbreaks of disease for military gain."[2]

The United States Army published this statement as part of its 2021 *Army Biological Defense Strategy* (*ABDS*), a response to the impact of the COVID-19 pandemic on the United States military. The *ABDS* recognizes the potential impact of biological agents on military operations. However, SARS-CoV2, the coronavirus that causes COVID-19, is not the only biological agent of potential operational significance. The incidence of meningitis caused by the bacteria *Neisseria meningitidis* remains higher in the active-duty military population than in the general population.[3] During World War (WW) I, the U.S. Army experienced a meningococcal meningitis case fatality rate of 39 percent. The fatality rate was lower during WWII but bacterial resistance to the only available antibiotic treatment at the time, sulfa, led researchers at Walter Reed Army Institute of Research (WRAIR) to work toward the development of a vaccine. The U.S. Army introduced the first meningitis vaccine in 1972.[4] In 2010, Dr. Peter Leggat, a physician and professor of public health, noted that despite one hundred years of vaccine and other medical countermeasure development, "vector-borne tropical diseases remain amongst the great problems for operational deployment of military personnel."[5] And the Defense Centers for Public Health—Aberdeen reported a 40 percent increase in syphilis rates from 2020 to 2022.[6]

Although the COVID-19 pandemic has been, perhaps, the most significant since the 1918 influenza pandemic in terms of the disruption it caused, no adversary is confirmed to have deliberately exploited it for military gain. The same cannot be said, historically, for other biological agents of military concern. This paper examines two historical instances when biological agents were exploited for military advantage and, as a result, changed commanders' decisions. Disease outbreaks, and the associated opportunities to use those outbreaks for military gain, played significant roles in the outcomes of both the American Revolution of 1775-1783 and the Haitian Revolution of 1791-1804. During the American Revolution, the British army used a smallpox epidemic to their advantage against the Colonial rebels—countered by General George Washington's eventual mandate to inoculate Colonial troops against the disease. During the Haitian Revolution, the Haitian rebels, under the leadership of François Dominique Toussaint Louverture and his successor, Jean-Jacques Dessalines, exploited a seasonal yellow fever epidemic to enable their defeat of Napoleon's forces. In his play, *The Tempest*, Shakespeare wrote, "Past is prologue." A failure to appreciate the potential impact of infectious disease on military operations risks both the mission and the force.

Smallpox

Smallpox is the disease caused by variola, an orthopox virus. Spread from person to person by respiratory droplets, by contact with fluid from smallpox sores, or by contact with contaminated clothing or bedding, the variola virus comes in two forms. Variola minor causes a mild disease, with a death rate of about 1%. Variola major, on the other hand, causes severe disease and has an overall case fatality rate of 30%. The type of rash developed in cases of variola major further stratifies risk of death. A discrete rash, where the lesions are separated by normal areas of skin, has an associated death rate of 9%. In contrast, a confluent rash has a 62% death rate. Smallpox is highly lethal, only requires a small dose to cause infection, incubates for an average of twelve days before symptoms appear, and is easily spread from person to person, making it an ideal biological weapon.[7] Both variola major and variola minor are included on the Health and Human Services/ US Department of Agriculture Select Agents and Toxins list, a list of pathogens and toxins that "have been determined to have the potential to pose a severe threat to both human and animal health, to plant health, or to animal and plant products."[8]

The smallpox vaccine was not developed until 1796, by physician Edward Jenner. Prior to this, the only protections from smallpox were avoidance and inoculation. Inoculation involved placing infected fluid from a smallpox lesion into an incision in the skin of an uninfected person. That person would develop smallpox but, usually, a mild case.[9] Dr. Zabdiel Boylston, a Boston physician, inoculated hundreds of Bostonians and kept detailed notes of their reactions to the procedure, including severity. One of Dr. Boylston's patients, 18-year-old John Colman, "had a kind and favorable small-pox, as is common in this way, and soon got well."[10] Once patients recovered, they had life-long immunity to the disease. However, because people who underwent inoculation actually developed smallpox, they could spread the disease to others, meaning they had to be isolated until they were no longer contagious.[11] Rarely, an inoculated person died. As Benjamin Franklin noted in a 1752 letter to Boston physician, John Perkins, "Sometime last winter, I procured from one of our physicians an account of the number of persons inoculated during the five visitations of the smallpox we have had in 22 years… the number exceeded 800, and the deaths were but four."[12]

The risk of spreading smallpox associated with inoculation made the procedure controversial, with many jurisdictions banning it outright.[13] Historian Elizabeth Fenn stated in *Pox Americana*, "Inoculation, although permitted at times during the British occupation, had been banned by civil authorities, who feared it would spread the pestilence further."[14] The British Army ignored the civil prohibitions and, as stated by historian Ann M. Becker in "Smallpox at the Siege of Boston," "routinely inoculated [soldiers] if the variola virus was present."[15] Evidence suggests that the British deliberately inoculated people then sent them among the Continental Army troops in the hope of causing a smallpox outbreak.[16] These factors influenced George Washington's decision to maintain a lengthy siege against British-occupied Boston rather than attack the city.[17] Smallpox also contributed to the Continental Army's loss in the battle for Quebec.[18]

Smallpox and the Siege of Boston

In April 1775, British forces engaged Colonial militia at the battles of Lexington and Concord, west of Boston, Massachusetts. The militiamen drove the British back to Boston and, over the next month, surrounded the city. On June 14, 1775, the Continental Congress ratified the Continental Army and appointed George Washington as Commander in Chief. Washington assumed command on July 3, 1775. The British, under General Gage and, later, General Howe, remained in control of Boston and the harbor to the east while the Continental Army remained in control of the surrounding areas on the south and west. The siege of Boston was underway. In a letter to John Hancock, written on 4-5 August 1775, Washington wrote:

> General Gage is making preparations for winter… From the inactivity of the enemy since the arrival of their whole reinforcement, their continual addition to their lines, & many other circumstances, I am inclined to think that finding us so well prepared to receive them, the plan of operations is varied, & they mean by regular approaches to bombard us out of our present line of defense or are waiting in expectation that the Colonies must sink under the weight of the expense or the prospect of a winter's campaign.[19]

Later that month, in a letter to his nephew, Lund, Washington, expressed his frustration over the British refusal to "quit their own works of defense" and "come out" of Boston.[20] "We do nothing," he lamented, "but watch each other's motions all day at the distance of about a mile."[21] Initially, Washington wanted to attack Boston as he "wish[ed] a speedy finish of the dispute."[22] In a September 8, 1775, circular to his general officers, he sought their advice on "whether, in your judgements, we cannot make a successful attack upon

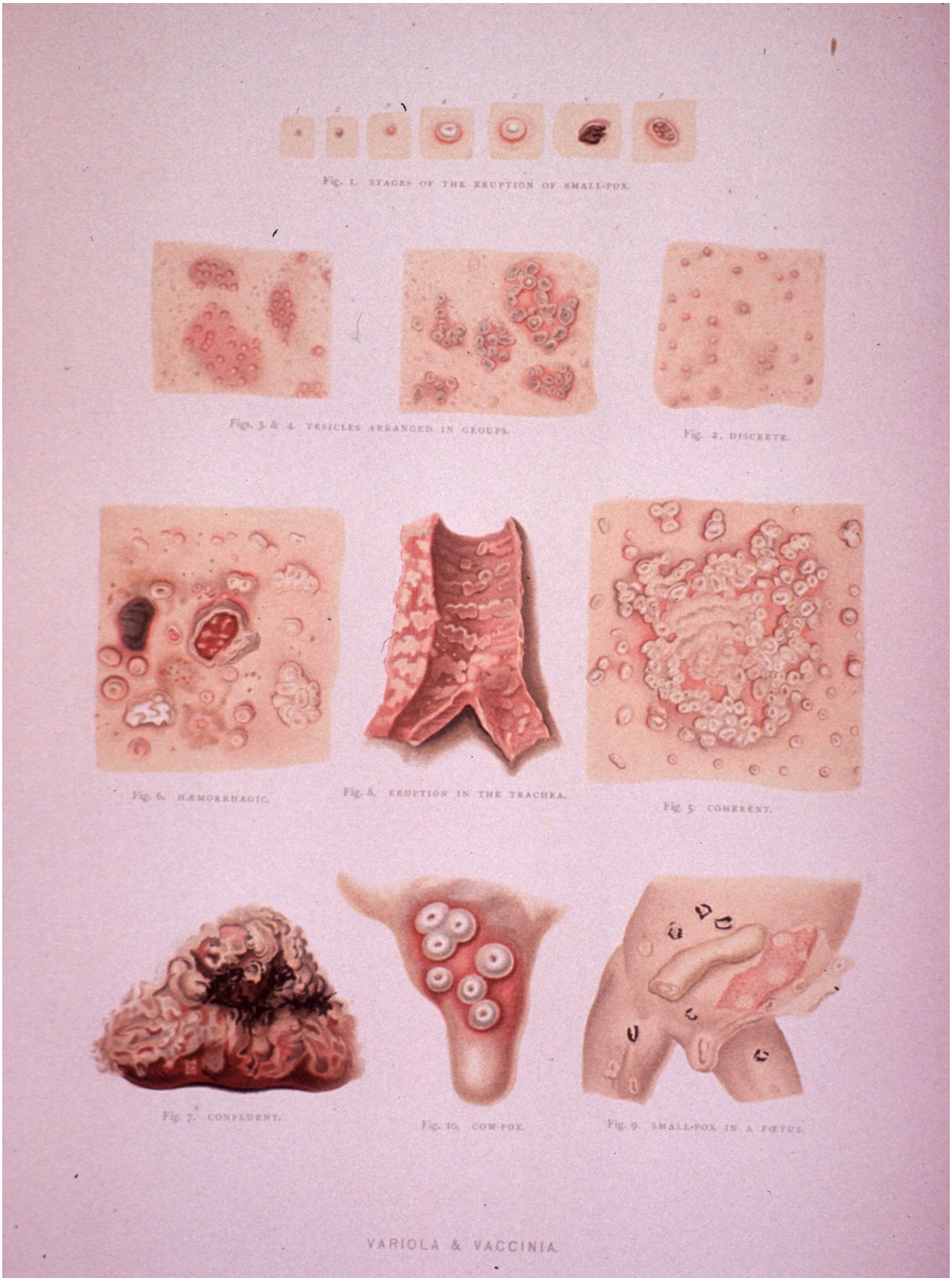

FIGURE 1: Byrom Bramwell. "Small-Pox : Variola & Vaccinia." In Atlas of Clinical Medicine. Edinburgh: 1892. Still image. Images from the History of Medicine. National Library of Medicine. http://resource.nlm.nih.gov/101434083.

the troops in Boston, by means of boats, cooperated by an attempt upon their lines at Roxbury."[23] His concern was for the coming winter weather "when warm and comfortable barracks must be erected for the security of the troops…a very considerable…expense must accrue on account of clothing [and blankets] for the men…"[24] Washington was also conscious that the current troops approached the end of their term of enlistment. "If this army should not incline to engage for a longer term than the first day of January… you must…levy new troops…These things are not unknown to the enemy."[25] Two days later, he expressed his continued frustration and his perplexity at the cause of the British inactivity in a letter to his brother, John Augustine Washington.

> Being…very securely entrenched and wishing for nothing more than to see the enemy out of their strongholds that the dispute may come to an issue. The inactive state we lie in is exceedingly disagreeable especially as we can see no end to it… Unless the Ministerial troops in Boston are waiting for reinforcements, I cannot devise what they are staying there after—and why (as they affect to despise the Americans) they do not come forth and put an end to the contest at once.[26]

However, knowing that smallpox raged through Boston and fearing New Englanders would refuse to fight as a result, Continental leaders "refused to permit nonimmune troops to enter Boston in an effort to prevent the spread of the disease."[27] The smallpox epidemic worsened and there was no attack. The siege continued.

The British used the Continental Army's vulnerability to smallpox to their advantage. Thousands of civilians lived in Boston at the time of the siege. While those loyal to the British crown may have regarded the city as a haven, not all the civilians wanted to remain, especially as supplies in the city dwindled. Allowing civilians to leave Boston benefitted the British by lessening the demand on resources.[28] In November 1775, "on account of the scarcity of wood and provisions [in Boston] …General Howe…issued a proclamation, desiring such of the inhabitants as are inclined to leave the town, to give in their names and a list of their effects."[29] Allowing them to leave also afforded General Howe the opportunity to spread smallpox to Washington's army. In an October 6, 1775, letter to the Massachusetts General Court, Washington reported that the "Winnisimet Ferry [to transport refugees from Boston to Chelsea] which was opened for the relief of the unhappy sufferers at Boston is now turned into a convenience for the enemy."[30] Washington warned that "caution [is] necessary to be used with these people to prevent a communication of the smallpox."[31] In December 1775, Washington reported evidence that "General Howe is going to send out a number of the inhabitants in order it is thought to make more room for his expected reinforcements…A sailor says that a number of these coming out have been inoculated with design of spreading the smallpox through this country and camp."[32] He wrote to John Hancock, "About 150 more of the poor inhabitants are come out of Boston, the smallpox rages all over the town, such of the military as had it not before are now under inoculation—this I apprehend is a weapon of defense [the British] are using against us."[33]

FIGURE 2: De Costa, J, and Charles Hall. "A plan of the town and harbour of Boston and the country adjacent with the road from Boston to Concord, shewing the place of the late engagement between the King's troops & the provincials, together with the several encampments of both armies in & about Boston. Taken from an actual survey. London, 1775." Map. Library of Congress. https://www.loc.gov/item/gm71002447/.

The siege of Boston lasted for almost a year. In January 1776, the Continental Army received cannon and artillery that had been captured at Fort Ticonderoga.[34] This prompted Washington to fortify his position at Dorchester Heights, a hill south of Boston from where the Continental Army could bombard the city. On March 13, 1776, Washington ordered,

> As the ministerial troops in Boston, both from information and appearance, are preparing to evacuate that town: The General expressly orders that neither officer or soldier presume to go into Boston, without

> leave from the General in Chief at Cambridge or the commanding General at Roxbury, as the enemy, with a malicious assiduity, have spread the infection of the smallpox through all parts of the town. Nothing but the utmost caution on our part can prevent that fatal disease from spreading through the army, and country, to the infinite detriment of both.[35]

Howe wanted to attack Dorchester Heights but the risk of suffering casualties on the magnitude of those lost at Bunker Hill, combined with a severe storm that rolled in, changed Howe's plans.[36] He decided to evacuate Boston. Washington agreed to a truce, in exchange for a British promise not to set Boston on fire, and the British left Boston by its harbor on March 17, 1776.[37] Washington ordered General Israel Putnam to "take possession of the [Dorchester] Heights" to prevent the British from returning and recapturing it and gave him command of "a thousand men," restricted to soldiers "who had had the smallpox."[38] Continental brigades that marched into Boston the day after the British evacuated were ordered to "cleanse" the town from smallpox." Other officers and enlisted were forbidden to enter until "the Select Men report the Town to be cleansed from infection."[39] The risk of disease had forced Washington to alter his strategy by choosing a lengthy siege over an attack and continued to impact his decision-making by restricting force flow into the city.

Smallpox and the Quebec Campaign

While Washington besieged Boston, the Continental Congress, heartened by American victory at Fort Ticonderoga, New York, in May 1775, planned an invasion of Canada. They wanted to capture the cities of Chambly, Montreal, and, ultimately, Quebec, thereby delivering Canada into American hands.[40] Initial plans called for General Schuyler to lead the campaign.

FIGURE 3: Faden, William. "Plan of the city and environs of Quebec: with its siege and blockade by the Americans, from the 8th of December to the 13th of May, 1776." [London: S.N, 1776] Map. Library of Congress. https://www.loc.gov/item/gm71005424/.

In an August 20, 1775, letter to Schuyler, Washington wrote, "The design of this express is to communicate to you a plan of an expedition… to penetrate into Canada by way of the Kennebeck River and so to Quebec by a route ninety miles below Montreal— I can very well spare a detachment of 1000 or 1200 men."[41] However, illness prevented Schuyler from leading the campaign, so command fell to General Richard Montgomery. Montgomery marched to Quebec Province in September and captured Montreal in November 1775.

Washington sent another 1000 men to Canada under the command of Colonel (later General) Benedict Arnold. Arnold planned to approach Quebec from the east while Montgomery approached from the west, allowing the Americans to surround the city. On December 5, 1775, Washington wrote to Arnold, "I have no doubt but a juncture of your detachment with the Army under General Montgomery is effected… you will put yourself under his Command and will, I am persuaded, give him all the assistance in your power."[42] Arnold arrived at Quebec in November but, unfortunately, he had lost nearly half of his troops to disease and desertion before he arrived. In a letter written the same day to General Schuyler, Washington wrote, "It gave me the highest satisfaction to hear of Colonel Arnold's being at point Levi, with his men…after their long and fatiguing march, attended with almost insuperable difficulties and the discouraging circumstance of being left by one third of the troops."[43] Montgomery's troops joined Arnold's in early December, giving them a combined force of 1100.

Smallpox also arrived in December, infecting approximately one-quarter of the troops, leaving only about 800 men able to fight.[44] Significantly, the smallpox outbreak put retention at risk. Many of the troops' enlistments ended on January 1, 1776. Fears of smallpox kept them from reenlisting for another term. As Becker stated, "Smallpox broke out in the [Continental] army…In addition to destroying the health of the soldiers in the field…the prevalence of the disease in camp was a factor in the dearth of recruits attracted and reenlistments secured for the Northern Army."[45]

The impending loss of men forced Montgomery and Arnold to attack Quebec on December 31, 1775, despite blizzard conditions. The snowstorm caused confusion, disorientation, and weapons malfunction. Montgomery was shot and killed, Arnold was shot in the leg and forced to give his command to General Daniel Morgan, many Continental troops fled, some retreated, and others were captured. Morgan surrendered to the British commander, General Carleton.[46] Arnold was able to reorganize the remaining American troops and encircle Quebec. His siege lasted until May 1776 when he retreated in the face of continued American troop losses due to disease and the arrival of British reinforcements.

In a June 1776 letter reflecting on "the causes of our misfortunes and miscarriages in Canada," John Adams wrote, "the smallpox, an unexpected enemy, and more terrible than British troops, Indians, or even Tories, invaded our armies and defeated them more than once."[47] Adams wrote to his wife, Abigail, that same month, "The smallpox is ten times more terrible than Britons, Canadians, and Indians together. This was the cause of our precipitate retreat from Quebec."[48] Many believed the smallpox outbreak was a result of the British "inoculating the poor people at government expense for the purpose of giving [the disease] to our army."[49] On July 3, 1776, John Adams again wrote to Abigail, "All these causes [political disagreements leading to delays in the invasion of Canada] …would not have disappointed us, if it had not been for a misfortune which…perhaps could not have been prevented. I mean the prevalence of the smallpox among our troops… This fatal pestilence completed our destruction."[50]

The loss of Canada led to "the first medical mandate in American history."[51] "In January 1777…Washington instituted a new military strategy to protect his troops and sustain the Revolution: systematic troop inoculation."[52]In a February 1777 letter, Washington wrote, "Finding the Smallpox to be spreading much and fearing that no precaution can prevent it from running through the whole of our Army, I have determined that the troops shall be inoculated."[53] He detailed his plan in a February 10, 1777, letter to the New York Convention. He cautioned them to keep the plan "as much a secret as possible" in case the British heard "that many of our men were down."[54] Washington ordered recruits sent to Philadelphia where they would be inoculated "while their clothing and arms and accoutrements are preparing."[55] He also ordered that the recruits be inoculated in tranches to limit the number who were "down at a time," ensuring there would be enough men fit for duty. Hospitals were positioned in easily defensible areas in case the British got word of the inoculations and took advantage of large numbers of men being confined to the hospitals during the required isolation period to attack. Washington assured the Convention that "after the first and second divisions of patients (who should be inoculated at an interval of five or six days) have gone through, the thing [a smallpox outbreak] will become extremely light and of little consequence, whether it is known or not."[56]

Yellow Fever

Like smallpox, yellow fever is caused by a virus. Unlike smallpox, no inoculation or vaccination against the disease existed in the 18th century. A vaccine to prevent yellow fever was not licensed for use until 1938, more than 100 years after Haiti declared its independence.[57]

The yellow fever virus belongs to the flavivirus family. It is classified as a viral hemorrhagic fever, with an incubation period of three or four days before symptoms appear. The illness manifests as high fevers, headache, vomiting, delirium, and pain, followed by liver and kidney failure and massive hemorrhage. Approximately fifteen percent of those who become symptomatic after infection will develop severe disease and between thirty to sixty percent of those who become severely ill will die.[58] Death occurs within one to two weeks of symptom onset.[59] There is no specific treatment for the disease. Yellow fever, unlike smallpox, has not been eradicated. The World Health Organization (WHO) reported 203 confirmed, and 252 probable, cases of yellow fever in the twelve countries of the WHO African Region from January 1 through December 7, 2022.[60] Because it is spread by mosquito bites, rather than by respiratory droplets or contact, yellow fever's bioweapon potential is not as high as smallpox's. But it is not zero. The US Government has declassified and approved for public release reports of "mosquito biting activity" testing done in the 1950s and 1960s. These tests were conducted using *Aedes aegypti*, the species that transmits the yellow fever virus, by the U.S. Army Chemical Corps, which had been tasked with "providing the Department of Defense with adequate CBR weaponry."[61] And yellow fever proved an effective weapon when seasonal outbreaks were capitalized on by Haitian rebels in their fight for independence against the French.

Yellow Fever in the Haitian Revolution

The Haitian Revolution began with a slave uprising in August 1791, when the colony was under French rule and was known as Saint-Domingue. It continued throughout the war between Spain and France, the French Revolution and abolition of the French monarchy, the expulsion of the British from Saint-Domingue, and the rise of Napoleon Bonaparte to power. In January 1801, a little over a year after Bonaparte overthrew the French Revolutionary government and became Consul of France, Toussaint Louverture, the Commander-in-Chief of Saint-Domingue, drafted a constitution that abolished slavery on the island and guaranteed equal rights for the Black and mixed-race ("mulatto") population. Bonaparte, in response, ordered his brother-in-law, General Charles Victor Emmanuel Leclerc, to sail to Saint-Domingue to remove Louverture from power and reinstate French rule.[62] On October 31, 1801, Bonaparte issued secret instructions to Leclerc that detailed a three-stage invasion plan. He authorized a land army of 19,000 soldiers and a fleet of several ships.[63] He expected the mission to last for three months, critically, ending by April. Haiti's rainy season officially lasts from April through October.[64] In France, they knew that the rainy season in Saint-Domingue was deadly. In his history of the Haitian Revolution, *Avengers of the New World*, Laurent Dubois stated, "Bonaparte and his strategists had concluded that in order to be successful his troops must occupy Saint-Domingue before April because later in the year 'the climate of the colonies becomes very dangerous for European troops who are not acclimated to it.'"[65]

FIGURE 4: Le 1er. Juillet , Toussaint-L'Ouverture, chargés des pouvoirs du peuple d'Haïty et auspices du Tout-puissante, proclame la Gouverneur général, assisté des mandataires légalement convoqués, en présenceet sous les Constitution de la république d'Haïty / lith. de Villain, r. de Sèvres No. 11. [Toussaint Louverture reading the Haitian Constitution]. Haiti, 1801. Still image. Library of Congress. https://www.loc.gov/item/2004669332/.

FIGURE 5: Le Rouge, Georges-Louis, and Crépy. "Isle de St. Domingue. Paris, Chez Crepy, 1767." Map. Library of Congress. https://www.loc.gov/item/74691674/.

Yellow fever outbreaks occurred with predictable regularity in Saint-Domingue, fueled by the slave trade, which provided a steady flow of mosquitoes, in addition to human cargo, from areas of Africa where yellow fever is endemic, and by the tropical climate. The mosquitoes that spread yellow fever lay eggs in standing water during hot weather. Crowded port cities during the rainy season provided the perfect setting for the disease to spread.[66] As those who survive the disease are protected against future infections, Africans, and people indigenous to Saint-Domingue, likely had acquired immunity to yellow fever.[67] Those most susceptible to yellow fever were "young men recently arrived from northern climates"—the type most likely to be found in a military encampment or naval vessel in a mosquito infested port.[68] The colony had earned a reputation as a "murderous" "Torrid Zone" and Louverture and the other Haitian rebels would have been familiar with the effects of yellow fever on "young men recently arrived from northern climates."[69] Louverture would have witnessed first-hand the effect of the fever on the British troops he fought against from 1794-1798.

Leclerc landed at Saint-Domingue in February 1802. By mid-February, he had gained control of the southern half of the colony and Louverture had lost half of his troops to defection to the French. Louverture realized that his

> only remaining option was to hold out until the rainy season…with the hope that France's troops would succumb to the tropical climate and fall ill. His strategy was founded in reality: within the first two weeks of Leclerc's arrival, 2,000 European troops were already in the hospital, three-quarters of them

> sick… After three weeks, 500 more soldiers had died and another 1,000 were wounded. Leclerc is forced to request an additional 6,000 troops apart from those already promised and further reinforcement of 2,000 troops per month for the next three months in order for his mission to succeed.[70]

Louverture and the other rebels believed that the French would reinstitute slavery in Saint-Domingue if they were victorious. While "wait[ing] for the 'rainy season that will rid [them] of [their] enemies' through disease," they opted for "destruction and fire," which included burning cities, destroying roads, and fouling the water supply to deny the French the use of these resources.[71]

The tactic succeeded. By April 1802, the beginning of rainy season, "a third of [Leclerc's] original army is incapacitated and… European troops are dying in hospitals at the rate of 30-50 soldiers per day."[72] Despite Louverture's capture in June 1802, the rebels continued to fight. They had gained on Leclerc by September of that year. Thousands of troops and hundreds of ships were sent by Bonaparte to reinforce Leclerc and his successor, General Rochambeau, but, in a letter to Rochambeau, Leclerc complained, "Most of the troops of General Brunet are ill… Reinforcements have now arrived… But illness is ravaging the battalion so badly that I am obliged to send almost all back to France…"[73] In June 1802, Leclerc had written to Denis Descrès, a colonial minister, "If the first consul wants to have an army in Saint-Domingue in the month of October, he must send one from the ports of France, for the ravages of the sickness are beyond telling."[74]

Leclerc, himself, died of yellow fever in November 1802. Rochambeau assumed command and continued waging war against the rebels. However, "the deadly combination of 'yellow fever and an enemy who gave no quarter' steadily undermined Bonaparte's plans for Saint-Domingue."[75] In April 1803, Bonaparte sold the Louisiana Territory to the United States, ending his ambitions for a North American empire. The next month, Great Britain renewed hostilities against France in Europe, which meant that Rochambeau would no longer be able to receive reinforcements. Bonaparte had previously sent 80,000 troops and more than 400 ships to Saint-Domingue.[76] Fighting between the rebels and the French continued until November 1803 when the rebels, under the command of Jean-Jacques Dessalines, defeated the French at the Battle of Vertières. Rochambeau surrendered and negotiated a cease-fire to allow the French to evacuate. "They left behind them upwards of 50,000 dead, the majority of the soldiers and sailors sent to the colony since early 1802."[77] Of the fifty- or sixty thousand who arrived in Saint Domingue from France, only 10,000 survived to return home.[78] Rebels who believed "the prospect of defeat"—in other words, re-enslavement— "was more frightening than the rigors of war," aided by strategic use of a predictable yellow fever outbreak, defeated France and established the independent republic of Haiti.

Conclusion

The American and Haitian revolutions both involved poorly trained, poorly equipped rebel colonists fighting against a world power's larger, better equipped, professional force. Both revolutions were motivated by a mix of economic pragmatism and the idealism of the Enlightenment. And in both, the outcome of events hinged on the knowledge of how to exploit a naturally occurring disease.

The British used smallpox to help them in their fight against the Americans, successfully at the battle of Quebec. However, because a medical countermeasure—inoculation—was available and George Washington was willing to mandate that his troops be inoculated, despite the risks and the opposition, the Americans were able to overcome Britain's efforts to take advantage of a biological incident.

In Saint-Domingue, both the rebels and the French troops knew that if the French were still in the colony during the rainy season, yellow fever would decimate them. Effective medical countermeasures against yellow fever did not exist. A vaccine would not be developed until the twentieth century. The only way to avoid the fever was to avoid Saint-Domingue's ports during the rainy season. The Haitians understood that the way to defeat the French was to keep them in the colony long enough for yellow fever to shift the odds toward their favor. This they did. Effective medical countermeasures against one biological agent and effective exploitation of another led to the creation of the first and second independent republics in the world.

One can interpret "past is prologue" to mean that history repeats. In one sense, this is true. Pandemics and epidemics have occurred throughout recorded history at least since 430 B.C.E. The COVID-19 pandemic will not be the last. The Secretary of Health and Human Services declared COVID-19 a public health emergency (PHE) on January 31, 2020. [79] Since then, the world has experienced a global Mpox outbreak and an outbreak of Highly Pathogenic Avian Influenza. Disease outbreaks will continue to occur. However, an alternate interpretation of "past is prologue" offers a way

forward. The past provides context. Lesson learned from the past can shape present actions and future outcomes. As the two examples detailed in this article—smallpox in the American Revolution and yellow fever in the Haitian Revolution—show, disease outbreaks have operational significance for the military. Therefore, military leaders and planners would be wise to heed the lessons of the past and consider how bioincidents, whether naturally occurring, accidental, or deliberate, will affect decision-making during large scale combat operations. ■

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Notes

1. A version of this article was originally submitted by the author as part of a course work requirement for a master's degree in public history from Southern New Hampshire University.

2. United States Army, *The Army Biological Defense Strategy, 2021* (Washington, DC: GPO, 2021): 1, https://armypubs.army.mil/epubs/DR_pubs/DR_a/ARN32553-SD_04_STRATEGY_NOTE_2021-01-000-WEB-1.pdf.

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6. V. Hauschild, "Syphilis, STIs Growing Threat to U.S. Armed Forces," *U.S. Army*, September 5, 2023, https://www.army.mil/article/269602/syphilis_stis_growing_threat_to_u_s_armed_forces.

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