

The Fever, Chapter 14: Epilogue

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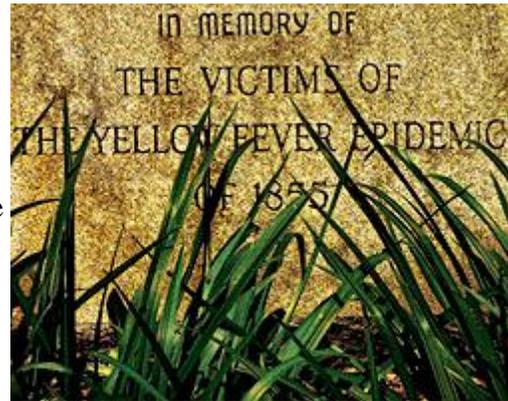
On Nov. 11, George Armstrong stepped into the First Presbyterian pulpit for the first time in two months. Scanning the faces of those in the pews, for a moment, he couldn't speak, couldn't shake off the sadness of the scene.

Throughout the pestilence's grip on the city, he had been too busy or too sick to think about its lasting devastation. Now that stared back at him.

Only half of the families were there, many with gaping holes. Only three families were not clad in black. The fever had knocked church membership back a decade.

Throughout the sanctuary, in vacant seats, he pictured the faces of the people who had sat there Sunday after Sunday – and would never again fill those seats.

His eyes shifted to another part of the church, where more than 60 children sat. They were dressed neatly, ranging in age from 2 to 14, orphans of the epidemic.



In Norfolk, a small granite marker on Hampton Boulevard marks the site of a mass grave. DELORES JOHNSON / THE VIRGINIAN-PILOT

THE FEVER



Discovery of the cause



**Walter
Reed**
(Sept. 13,
1851-Nov.
23, 1902)
was a U.S.

Army surgeon who led the team that proved the theory supported by the Cuban scientist Dr. Carlos Finlay that yellow fever is transmitted by mosquitoes rather than direct contact.

Soon after graduation from the University of Virginia, Reed became a medical officer in a time of great advances in medicine due to widespread acceptance of Louis Pasteur's germ theory of disease as well as the methods of studying bacteria developed by Robert Koch . Reed worked closely with George Miller Sternberg, the Army surgeon general, who was one of the

“Some of them, when found,” he remembered, “were in the house alone with the dead body of their last remaining parent; and they, poor little things, so young that they did not know their own names.”

The best salve he could muster was to remind those gathered that the church on earth was never more than a recruiting station, that God had found their relatives worthy of heaven sooner than others.

When he thought of Norfolk’s condition, he remembered when he had lived in Lexington and a brush fire had leapt from its confines and scorched mountainsides. A few months later, even after trees and shrubs had begun to green again, desolation had tinged the forest. Trees entirely consumed, mounds of ashes in their place, others with blackened trunks, new leaves seared at the fringes.

“I know not how better to describe our city at the present time,” he thought, “than by saying that it forcibly recalls to my mind one of these burnt forests.”

After the epidemic, city leaders set out to find its origin. They wanted to confirm that the Benjamin Franklin had imported it – an outbreak known to have a local source would prove that the two cities were unhealthy.

A few of those who persevered through that summer nearly hit upon the cause of yellow fever. Armstrong was among them, as close as any to saving thousands of lives in the next half-century.

Armstrong, and others, focused on the “plague fly” that had appeared toward the end of August and swarmed Portsmouth streets so much that people had to cover their faces to walk.

Armstrong theorized that the insect was a native of countries where yellow fever was indigenous and “that this insect, having been brought here, perhaps in the hold of the Ben Franklin ... has produced its eggs in vast numbers.”

In truth, plague flies were likely the blowflies that emerge in decaying flesh. They had appeared in both cities when the weather was hot and bodies waiting for coffins were decomposing in homes.

Yellow fever did come in the hold of the Franklin, but in the form of the *Aedes aegypti* mosquito that lived in the tropics and also in southeastern Virginia.

founders of
bacteriology.

Yellow fever became a problem for the Army during the Spanish-American War, when the disease felled thousands of soldiers in Cuba. In May 1900, Reed, a major, was appointed president of a board “to study infectious diseases in Cuba paying particular attention to yellow fever.” Other members were doctors James Carroll, Jesse Lazear and Aristides Agramonte. This board eventually proved the transmission by mosquitoes and disproved the common thinking that yellow fever could be transmitted by clothing and bedding soiled by the body fluids of yellow fever sufferers. Their work with the disease was largely responsible for stemming the mortality rates from yellow fever during the building of the Panama Canal in the early 1900s, something that had confounded the French attempt to build in that region only 30 years earlier.

Mosquitoes were breeding in the Franklin's hold or the open barrels on deck that stored drinking water. Because the Franklin carried both infected mosquitoes and sick crew, it arrived in Hampton Roads a ready-made, floating epidemic.

The mosquitoes infected with yellow fever bit people who then became hosts for the virus. When other mosquitoes bit those people, those insects became infected. As more mosquitoes and people became infected, the epidemic fed itself.

After previous epidemics, Norfolk had attempted to make itself less hospitable to disease by filling in creeks with trees, logs, torn-down barns and wrecked ships. The wood had decayed, swelled in the sun at low tide, rotted and offered infinite breeding beds.

The Southern Argus called the city's filling of a creek in order to build City Hall – now MacArthur Memorial – “one of the most bungling improvements, in a sanitary point of view, that young America in the wantonness of his youth and folly, ever perpetuated.” The large marsh had drained several smaller feeders, which when cut off became fetid swamps.

The city's streets may have been paved, but many of the houses then sat too low and detritus drained onto the lots.

The two cities were like a fermenting petri dish.

After the first frost that year, the residents who had fled returned to the city. But few were sure how much of a rebirth there would be. If the fever returned again the following summer, many thought residents would flee, never to return. And the cities would go bankrupt.

The Argus took an optimistic view, sarcastically denouncing another paper's doomful prognosis.

“Will there be no carriages, gigs, harness, soap and candles, smith's work, furniture, wanted by those who have heretofore been in the habit of purchasing such articles of manufacture in this market?”

The Argus knew that the cities' past trade hinged on two things – the Dismal Swamp Canal and the Seaboard and Roanoke Railroad – “and we don't know that they are particularly liable to the fever.”

Of course, their operators were. And from the looks of it, much of the city's leadership and entrepreneurial backbone had vanished with the fever.

In cold numbers of deaths, order had so greatly broken down that hardly anyone knew. The Howard Association had an idea – it had employed 25 extra gravediggers during the fever, and they had buried 2,300 people. That didn't count hastily buried bodies, servants or slaves who had interred their own or those who died out of town.

In Portsmouth, officially, another 900 had been buried. Some estimated that as few as 8,000

remained in the cities, which would mean that more than one out of three died – one of the deadliest epidemics in history.

It was hard to calculate what the pestilence had cost the cities.

How much does it stifle a city's future to lose its young mayor, a man known for being accepting to all parts of the population at a time when many were not? How much is progress slowed by the removal of ambitious business owners? How many jobs might those bold thinkers have created in five, 10 or 25 years?

How many lives would Dr. John Trugien have saved during his next 40 or 50 years in practice? When the doctors with bedside seats to the fever died, were ideas about its cause lost with them?

Norfolk and Portsmouth changed little during the second half of the 19th century and reminders of the epidemic could be seen frequently.

In early 1856, firemen led a solemn procession in tribute to the dead through Norfolk's streets. The city's orphans walked in the parade, escorted by the Howard Association and its honorary member, John Jones.

Jones, the hearse driver, turned down those who wanted to buy his freedom, because Virginia law would have required him to then leave the state.

That same year, the steamer that had brought the epidemic to the cities was sold to the Venezuelan government. What became of the Benjamin Franklin after that is not known.

In January 1859, a march through the streets again reminded Norfolk of the pestilence. The bodies of the Philadelphians – 15 physicians, nurses and druggists – were disinterred. A column of 50 men, including the male orphans, escorted the coffins to the steamer that would finally carry the martyrs home.

The Civil War came to Norfolk seven years after the 1855 epidemic, with the Northern Army patrolling the city until 1870. The stranglehold of the Union's occupation, along with decades of reconstruction following, makes an assessment of the fever's long-term damage difficult.

Because of the epidemic and the war, so many wives had been widowed that the city had a problem with homeless women. Many found work only as prostitutes and in saloons. One was Mollie Hogwood, an orphan of the epidemic, who worked downtown and owned more diamonds than any woman "of her class" in the city.

For several decades, downtown Norfolk wallowed in sin, with more than 240 bars, gambling parlors, variety theaters and brothels. A New York publication argued that Norfolk was "the wickedest city in the United States."

Yellow fever continued to terrorize coastal cities for several decades, and its cause was only discovered after it became a military necessity. During the Spanish-American War of 1898,

fewer than 1,000 American soldiers and sailors died in combat. But more than 5,000 died of disease, and yellow fever was the most dreaded of those to sweep through the camps.

If the United States was ever to occupy Cuba, a cause and a cure for the fever would have to be found. Two years later, Dr. James Carroll and Dr. Jesse Lazear – U.S. Army colleagues of Dr. Walter Reed – allowed themselves to be bitten by an *Aedes aegypti* mosquito that had fed on several yellow fever patients. Another colleague participating in the research, Dr. Aristides Agramonte, was thought to be immune because of a mild case of yellow fever when he was a boy.

The researchers thought Reed too old to survive the fever, so he went back to Washington. Lazear was infected and died. Carroll became gravely ill. When he recovered, Reed wrote him: “Hip! Hip! Hurrah! God be praised for the news from Cuba today.”

The risk the men took led to proof of the cause of yellow fever, along with pioneering the use of human subjects in controlled medical studies. Carroll later became embittered with Reed, feeling slighted that the media and public gave Reed alone credit for the discovery.

The revelation led to new battles with mosquitoes in the South, and in 1905, 50 years after the fever, the Norfolk health commission held a special meeting to rally the city to clean itself up. Standing water had to be cleared, residents were told. Abandoned cisterns had become breeding hotbeds and would have to be covered.

An expert recommended that crude petroleum should be poured in to kill the larvae in any water that could not be drained.

The public’s fascination with the disease and the research to combat it continued into the 1900s. A play called “Yellow Jack” launched on Broadway and was followed by a movie.

In the 1930s, a live-virus vaccine was developed that is still in use today. But yellow fever staged a powerful resurgence in South America and Africa in the 1980s and flares up every year.

The World Health Organization estimates that yellow fever causes 200,000 illnesses and 30,000 deaths every year in unvaccinated populations. Yellow fever deaths recently have occurred in Venezuela, Liberia and Guinea.

The fever would be unlikely to take hold again in the United States, with modern improvements such as window screens and air conditioning keeping mosquitoes out of homes.

The *Aedes aegypti* was driven out of southeastern Virginia in the 1980s when the *Aedes albopictus* (Asian tiger) mosquito took over its puddles, tires and breeding containers. Those mosquitoes transmit dengue viruses in Asia and carry Eastern equine encephalitis (EEE) in this country. They were accidentally imported from Southeast Asia in a cargo ship full of tires.

In the past decade, the United States has had only four yellow fever cases, all imported. The last death came in 2002, when a Texas man went fishing, unvaccinated, in the Rio Negro in South

America.

But mosquitoes and epidemics continue to threaten the world's population. The journal Nature published a study in March saying that malaria is likely twice as commonplace as thought. Then there's Avian flu, SARS, West Nile and EEE. And none of the old-world scourges have ever really vanished: Earlier this year in the Democratic Republic of Congo, the plague broke out, killing more than 50 people.

Ships still come into Hampton Roads hauling cargos from around the world, and bilge water swimming with organisms.