

The Case of the Contaminated



Long Island, New York, 1906. Ah, summer! Sun, surf ... and typhoid. At least that's how it was for Charles Warren, a New York City banker who was banking on a good time when he rented a summer place for his family.

By the end of August, typhoid fever had struck six out of eleven people in the Warren household. The youngest daughter, Margaret, was the first to crawl into bed with a high fever, splitting headache and diarrhea. Eventually

her mother, sister, two maids and the gardener slid into the same feverish delirium. They were not enjoying their summer vacation in the large, beautiful home owned by George Thompson.

Thompson's summer

began to look bleak, too. Typhoid is contagious, and Thompson knew that no one would rent the house once the Warrens left. And worse, typhoid houses were sometimes burned to the ground in an effort to get rid of the disease.



Terrible Typhoid

Salmonella typhi is a bacterium that causes typhoid fever. The disease was a common menace in North America in the early 1900s. It was often spread through contaminated food or water. The bustling city of Chicago was dubbed Typhoid Fever City. Two epidemics swept through Toronto while the city fiddled with the public water system. (Residents called the reservoir water "drinkable sewage.") In New York City, roughly four thousand new cases of typhoid were reported every year.

But poor people in crowded spaces with inadequate sanitation were the usual typhoid victims, not the rich. Long Island and typhoid? Presidents summered there for goodness' sake!

George Thompson called in some medical experts. They were quick on the draw. Typhoid? Surely it was the drinking water. But a search for typhoid germs turned up nothing. The one indoor toilet, the outhouse and the animal manure pile were all analyzed. Again, nothing. Milk and cheese were suspected next. No

luck. Clams! The family loved clams and often bought them from locals. Maybe the shellfish came from a polluted bay. Yet the neighbors also munched on the same clams, and they didn't get sick.

Thompson needed the medical equivalent of Sherlock Holmes, fast.

THE TYPHOID SOURCES???

- Doo-doo in the drinking water?
- A leaky outhouse or toilet?
- Manure-laced munchies?
- Contaminated clams?

Case # 4739

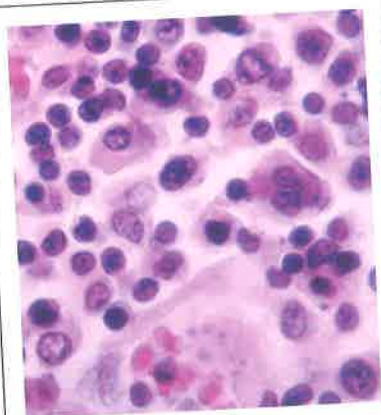
Tracing Typhoid

Typhoid probably originated in rodents and birds. It's one of many diseases caused by salmonella — a group of bacteria that live in warm-blooded species.

Eat something contaminated with *Salmonella typhi* and a week later you're running a high fever, clutching your head and belly in pain and running to the toilet. You might also be coughing. Children make up the majority of typhoid victims.

Today, about four hundred cases are reported yearly in the United States, but these typhoid victims are usually infected while traveling elsewhere.

Typhoid is found mostly in poor countries. Worldwide, there are up to twenty-two million new cases per year, with two hundred thousand deaths. Typhoid is easily controlled by cleaning up sewer systems and water supplies, but making these improvements costs money that many developing nations do not have.



Typhoid bacteria

The Carrier Culprit

Enter Dr. George Soper. At age thirty-six, Dr. Soper was a no-nonsense New York City sanitation engineer and expert epidemiologist (a person who tracks the spread of diseases). He had solved other mysterious epidemics in 1903 and 1904. And he was known to burn down a house or two to eradicate typhoid.

The Warren case intrigued Soper — only ten previous cases of typhoid had ever been reported in the Oyster Bay area prior to the Warrens' unfortunate summer vacation. Soper interviewed the Warrens and their servants. He even pored over a list of house

visitors going back ten years. Researching the medical histories of the visitors, Soper found that no seriously sick person had even visited the house in those years, and there was certainly no history of typhoid. Strange. Typhoid sources usually turn up easily when you know where to look.

Soper concentrated again on the current household's activities. Perhaps Margaret Warren and the others had gotten sick after a visit somewhere else. It was another dead end. No one had gone anywhere for weeks.

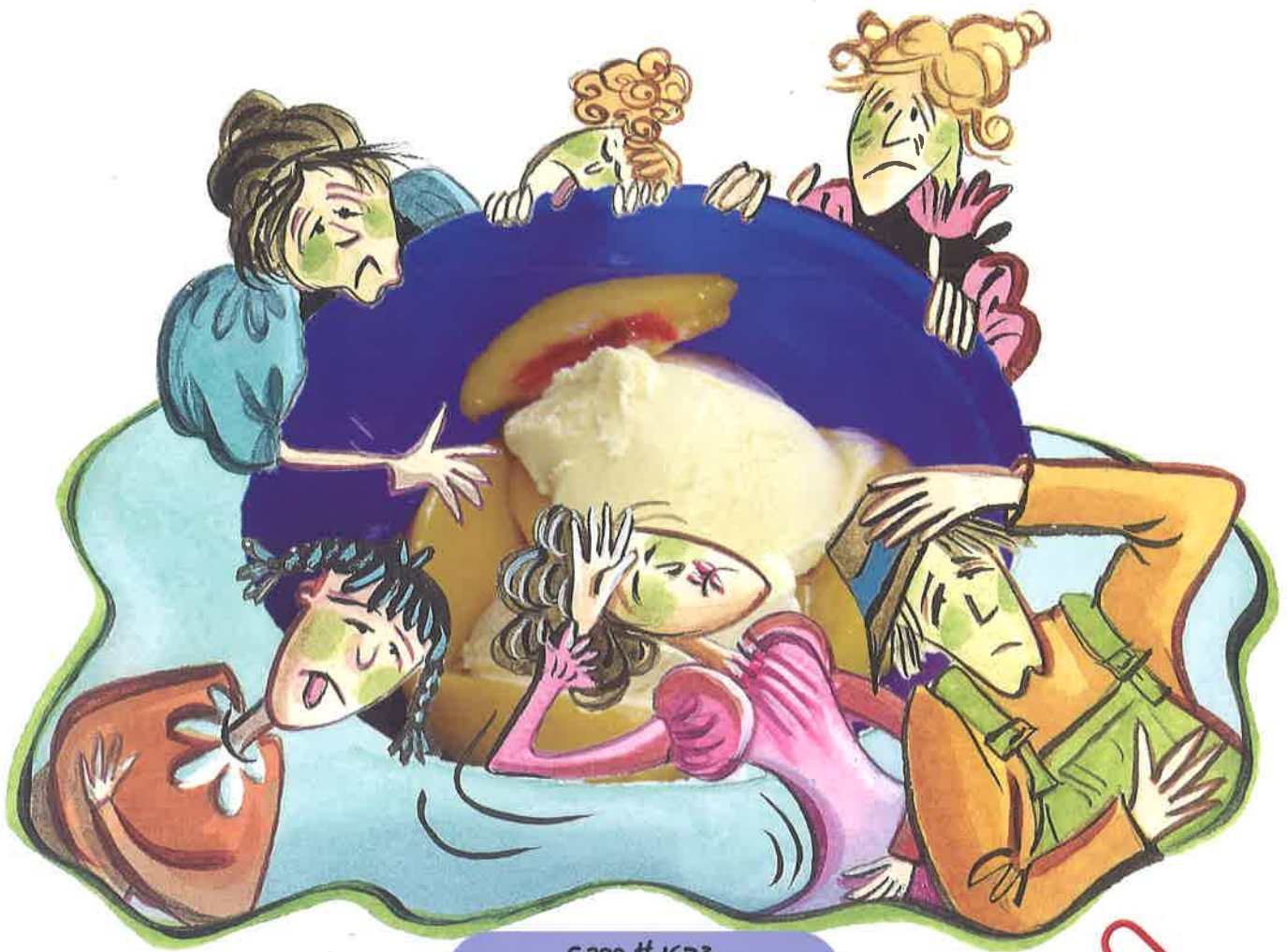
Margaret, however, took sick August 27. Soper

reasoned that around August 20, the bacterium must have been lurking in the food she ate. But how did it get there?

Soper checked with the kitchen staff. The family had changed cooks on August 4. Cooks handle food. Could the cook be the missing piece of the puzzle?

According to the family, the new cook, Mary Mallon, had showed no typhoid symptoms. Still, from reading medical journals, Soper knew that a healthy person could spread typhoid. These people are called "carriers" — they never notice they have the disease, or they have a full-blown case and recover but still carry the bacteria.





Case # 1623

Soper focused on Mallon, who had since moved on. He asked more detailed questions of the staff and family. For three weeks Mallon had made breakfast, lunch and dinner in the posh home's kitchen. Typhoid germs are usually killed when heated. But before Margaret and the others had fallen ill, Mallon had put together a dessert of fresh peaches and ice cream. No cooking involved. Then the cook was gone, leaving behind illness, but no forwarding address.

Disease Trackers

Epidemiologists track diseases. They study the spread of diseases and try to stop them cold — before they cause an epidemic.

The World Health Organization has teams of epidemiologists who “spy” on diseases, everything from obesity epidemics to infectious illnesses like polio. Disease-hunters fan out across the globe, tracking diseases and, if possible, getting rid of them through vaccination programs. You can’t vaccinate against obesity, but measles, whooping cough and polio can all be tamed.

Vaccines ended the life of smallpox in 1979. They also limit epidemics of cholera, typhoid and the ever-changing influenza (flu) virus.



To Catch a Cook

Mary Mallon was described as Irish, in her late thirties, intelligent, single and in perfect health. Soper knew Mallon was his most important lead — he needed to find and question her.

Soper approached the employment agency that helped Mallon find work. He studied her employment history and questioned past employers, servants, friends — anyone who knew Mallon. In the ten years she had been a cook, Mallon worked for eight families, seven of which had developed cases of typhoid.

Mallon was looking awfully suspicious. Soper wanted to talk to her, but she had disappeared.

Soper scoured the city and found the cook at a ritzy Park Avenue residence. On February 23, 1907, the daughter of the house died of typhoid fever. Mary Mallon had started cooking for the family two months earlier. Time to pay the cook a visit, reasoned Soper. Surely Mallon would want to know if she was giving people typhoid.

It was a short interview. Soper, not known for his tact, demanded stool and urine samples to test for typhoid. Mallon thought he



was a nut case. The blond, blue-eyed cook — the picture of health — grabbed a carving fork and chased him. Soper ran.

For the next meeting, Soper took along a doctor friend. They stopped Mallon on the way to a friend's house. She was a carrier, the doctor duo explained, but Mallon blew her stack, and the two men gave up. It seemed hopeless. Time to bring in the big guns.

Dr. S. Josephine Baker, a medical inspector with the New York Department of Health, visited Mallon, asking for specimens. Mallon slammed the door in her face. The next day,

Baker was back, with several police officers. Mallon escaped. After hours of searching, the cook was found hiding in a neighbor's closet. The police dragged her to an ambulance. With Baker literally sitting on Mallon, and Mallon cursing and ranting, the cook was brought to the hospital. Finally she relented and gave urine, blood and stool samples. Her stools were teeming with the bacteria. She was, as Soper had guessed, a typhoid carrier. And it didn't help that Mallon was less than thorough when she washed her hands after using the toilet.

Shoo, Flu

In May 1997, a three-year-old boy in Hong Kong went to the hospital with a cough and high fever. He was struggling to breathe. The laboratory confirmed the worst: a new type of influenza virus, called avian flu.

Influenza, usually called flu, causes fever, fatigue and muscle aches. In the very young and very old, it often allows deadly pneumonia bacteria into the lungs. The flu virus is constantly changing, so a new vaccination is needed each year. But every eight to forty years the virus does something unique — it totally rearranges its genetic make-up and becomes a brand new type of flu. With no available vaccine and no immunity, the new strain can cause a pandemic (a global epidemic) in which people worldwide get sick. The 1918 influenza pandemic killed between twenty million and forty million people. And modern travel means viruses can hitch a ride via jet, landing anywhere in the world within hours.

Wild ducks are the main flu carriers. Avian (bird) flu can be fast and fatal for domestic birds, such as chickens, while humans are unaffected. This avian virus, however, had jumped directly from a bird to the boy, probably through pet chicks kept at his preschool. The chicks fell ill and died. So did the boy. He was one of six deaths out of the eighteen people who

came down with avian flu in Hong Kong that year. Epidemiologists were shocked; they had to track down the virus's origin.

Flu-hunters went into overdrive. A study revealed that 10 percent of the chickens in the food market had the virus, as did wild geese and ducks. Ah ha! Slaughter the chickens and a major source of the bird flu virus would disappear.

Within three days, over a million chickens were gassed or had their throats slit. The flu strain was stopped or at least slowed down, but it was just the beginning of a new flu era. Avian flu came back to stay two years later, and epidemiologists are still trying to track down — and stop — new outbreaks.



Chickens can be infected with avian flu by migrating ducks and geese.

Confining the Cook

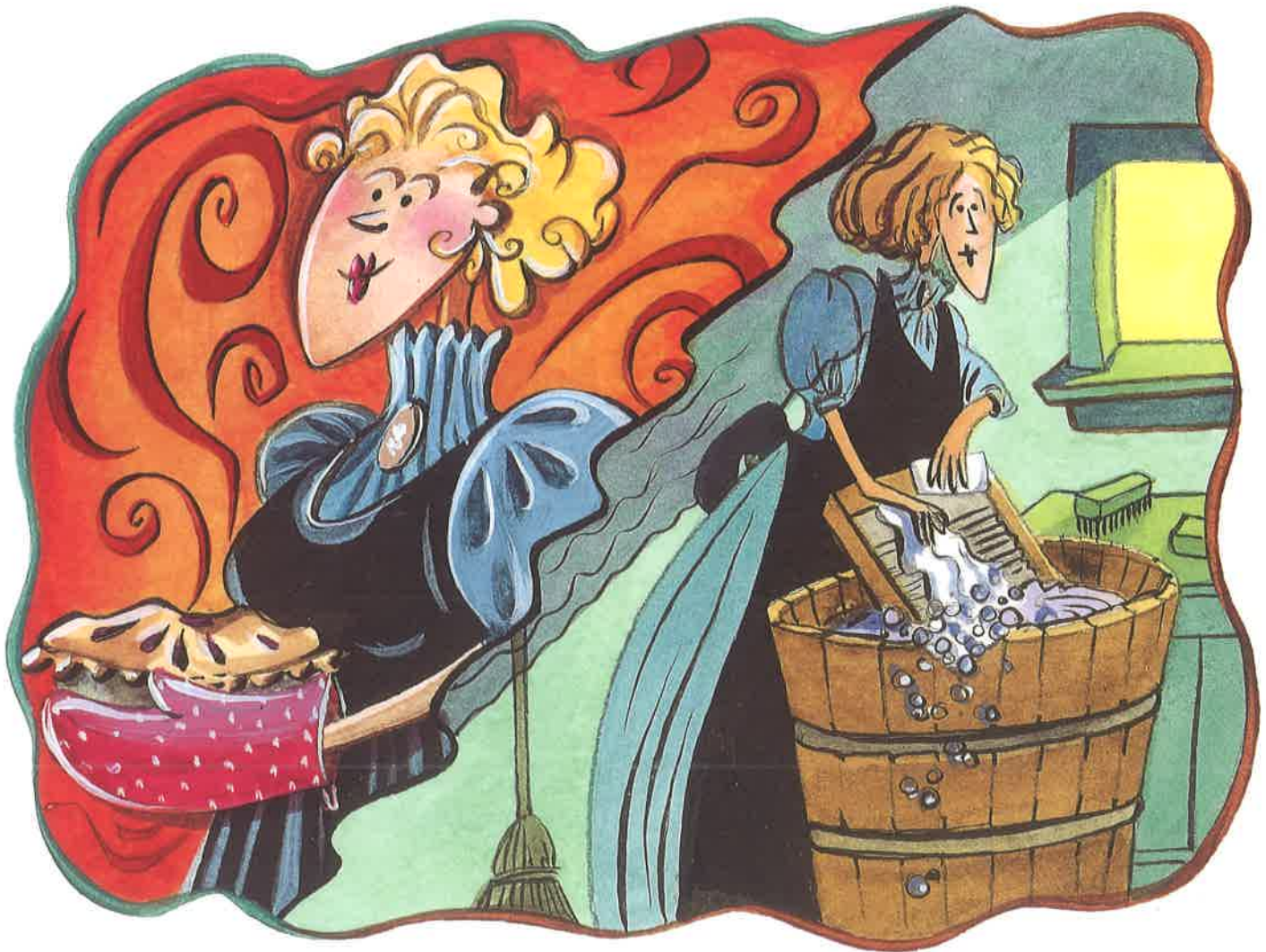
When news hit the papers, Mary Mallon was soon nicknamed Typhoid Mary. Back in 1907 there were no antibiotics to treat her, and almost every sample she ever gave turned up typhoid. She was the first healthy carrier ever identified, although hundreds were eventually discovered. For three years Typhoid Mary was a prisoner, held at a hospital. She was the only healthy carrier ever confined.

Public pressure forced the release of Mallon, and she promised never to cook again. She washed clothes instead. It was a low-paying job, much less glamorous than being a cook. She changed her name and disappeared.

But then, in 1915, a prestigious maternity hospital needed Soper's services. Twenty-five cases of typhoid fever had erupted, mostly among doctors and nurses. A few

interviews later Soper knew who the culprit was. It was the hospital's cook — Typhoid Mary "Brown."

Tracked down again, the cook offered no resistance. She was confined to a one-room cottage on hospital grounds for good. In 1932, she had a stroke. Typhoid Mary died five years later, after twenty-three years of confinement. She had infected at least fifty-one people and caused three deaths.



Pass the Soap

The American Society of Microbiology reports that only 39 percent of Americans wash their hands after sneezing or coughing. So if you shook hands with four people during the cold season, two of them might have contaminated hands. Yuck.

Touch your eyes, nose or mouth after touching a contaminated person or thing and you're giving germs a pathway into your body. Infectious diseases — colds, flu and intestinal illnesses — are often spread hand-to-hand. To stop the spread of germs, wash your hands frequently. Here's how to do it: Use lots of soap and warm water. Lather up to your wrists. Rub your hands together thoroughly while singing "Happy Birthday" twice. Rinse. Dry. Smile — you're germ-free.



Project 1: All Washed Up



Ask people if they wash their hands after using the toilet and almost all of them will say yes. So researchers stationed themselves at major airports in the United States and watched.

They found that more than 10 percent of the people did *not* wash their hands after using the toilet.

Station yourself in your school washroom for fifteen minutes — try to look inconspicuous — and record how many people leave without washing their hands. Are your numbers the same — do one out of ten people not wash their hands?

