1347–1353
The bubonic plague spreads from the Mediterranean throughout Europe, Africa, and Asia, killing between 75 and 200 million people.

1315

A year of almost continual rain in Europe

1347–1353

Between 75 million and 200 million Europeans and Asians die from the bubonic plague in what is called the "Great Mortality"

1350s

The Renaissance begins in Europe, a cultural rebirth focused on the arts, music, and literature

Chapter One

The Great Mortality: Bubonic Plague

In the central Asian country of Kyrgyzstan, Lake Issyk Kul sits nestled in a valley surrounded by snow-capped mountains. The crisp air carries the fruity smell of spruce trees and golden beaches hug the eye-shaped lake. This peaceful setting is scarcely the place one would expect to give birth to the worst mass murderer in history.

But during the fourteenth century, just such a villain hitched a ride south and embarked on a killing spree that left millions dead. The murderer's name was *Yersinia pestis*.

Yersinia pestis is no ordinary villain—it is a bacterium.

Historians call this grim reaper the black death, or bubonic plague. People in fourteenth-century Europe referred to its five-year reign of terror as the Great Mortality.

Yersinia pestis has been around for thousands of years. It usually lives in "plague reservoirs." These are isolated parts of the world that house colonies of wild rodents, *Yersinia pestis*'s favorite host.

During the 1300s, one such reservoir was Lake Issyk Kul on the Mongolian Steppe. The tarbagan lived there. This is a species of marmot prized for its golden fur. Buried in that fur were fleas, the vector that would carry *Yersinia pestis* on a European death tour.

Yersinia pestis is a wanderer. Normally, it travels very slowly. It takes a perfect storm of circumstances for this bacterium to ignite a major outbreak of the plague.

In the mid-1300s, just such a storm occurred.

People were on the move during the early 1300s. Nomads had created a road across the Mongolian

Steppe, and European merchants eager to trade with China discovered it. They could use this overland route to transport items east faster than by ship.

When merchants camped overnight at Lake Issyk Kul, tiny stowaways—fleas—leapt into their luggage. In the bloodstream of these fleas rode *Yersinia pestis*.

The flea could survive for six weeks without food as it traveled comfortably in a bag of grain or on a bolt of silk. When the merchant reached a city, the fleas jumped onto a secondary vector—the rat.

Rats were everywhere during the Middle Ages. Rats breed with lightning speed and they are great survivors. In three years, 329 million babies can be produced starting with just one rat couple! The rat can leap 3 feet from a standing position and drop 50 feet without injury. Rats can squeeze through a quarter-inch opening and gnaw through lead, concrete, and brick.

In the body of the flea, on the back of a rat, *Yersinia pestis* could go anywhere.

Weather was another factor that paved the way for *Yersinia pestis*'s conquest of Europe. A mini ice-age struck Europe around 1250.

Winters were cold and summers wet. Waterlogged wheat and rye rotted in the fields. There were volcanic eruptions in Italy, earthquakes in Austria, floods in Germany, and swarms of locusts in Poland.

Mother Nature was not happy during the late 1200s. These weather extremes lured *Yersinia pestis* out of hiding.

Nothing makes *Yersinia pestis* happier than death and misery, and Europe had these to spare during the early 1300s.

The cities of Venice and Genoa fought constantly for control over the seas around the Italian peninsula. France and England kicked off the Hundred Years' War, and conflicts raged from Scotland to Spain. In this bloody time, *Yersinia pestis* would thrive.

There was filth, too, a bacterium's favorite environment.

Cities were overcrowded cesspools. Barbers not only cut hair, they also cut veins. Barber-surgeons treated ill patients with a method called bloodletting. Slice a vein open. Drain some blood into a bowl. Bandage up the sick person, then dump the blood into the street.

Butchers slaughtered livestock out in the open. Piles of discarded hearts, livers, and guts attracted flies and rats. Few cities had any form of sanitation.

Laws simply required people to yell, "Look out below!" three times before emptying their chamber pots out the window.

The Quack, by Franz Anton Maulbertsch, shows barber surgeons at work

Streets in Paris, France, were named for the crud that clogged the gutters—rue de Pipi and rue Merdelet, for example. "Pipi" is the French word for pee and "merde" is French for, well . . . the other thing.

Life in the country was better, but not without risk. Peasants lived in mud and wattle huts with thatched roofs infested with insects. In winter months,

livestock lived indoors with their owners. Heating water was time-consuming and costly, so people rarely bathed.

Dirt, blood, war, environmental extremes, and humans on the move created the travel package *Yersinia pestis* had been waiting for. The bacterium hit the road in the 1340s.

Its first stop was Caffa.

The medieval town of Caffa sat on the east coast of Crimea where it dips its big toe into the Black Sea. This bustling town of 70,000 people was full of merchants from Genoa, Italy. Slaves from Ukraine, sturgeons from the Don River, silk from Central Asia, and timber and fur from Russia were loaded into hundreds of galleys docked in the harbor. Once their cargo holds were full, these ships headed to ports as far away as London, England.

The Genoese governed Caffa under a grant issued by the Mongols. These were rulers of a great empire that stretched from the Yellow River in China to the Danube River in Eastern Europe. Caffa was a Mongol colony, and the Genoese and Mongol leaders often clashed.

In 1343, a major dispute broke out between Genoese merchants and local Mongols. The Genoese retreated behind the walls of Caffa, and a large Mongol army laid siege to the town. The Mongols prepared to starve the Italians out.

Three years passed, and the siege strategy might have worked but for one problem. While the Mongols' attention was glued on Caffa, *Yersinia pestis* snuck up from behind and bit the Mongols hard.

When the Genoese saw the Mongol army shrink as soldiers sickened, they were overjoyed. God had spared them!

Not so fast.

According to legend, Khan Janibeg, the Mongol leader, issued a final parting shot. He "ordered corpses to be placed in catapults and lobbed into the city in hopes that the intolerable stench would kill everyone inside. . . ."

No accounts survive to describe what life was like in Caffa after those infected Mongol bodies sailed over the city walls, but it could not have been pretty. Panicked Genoese must have surged to the harbor, desperate to escape the city of death.

As white sails unfurled and the galleys moved westward, the passengers would have breathed a sigh of relief. They had escaped. But the roar of the wind

and the flap of the sails covered the squeaks of rats crawling in the cargo hold, scratching the fleas that infested their fur.

Inside those fleas lurked *Yersinia pestis*.

In late September, a fleet of Genoese galleys drifted into Sicily, the island off the boot of the Italian peninsula. As fishermen unloaded their catch and housewives gossiped from windows, dockworkers boarded the ships and unloaded the cargo in the city of Messina. The Genoese crew went ashore, unknowingly bringing their stowaway with them.

Almost immediately, the people of Messina began to sicken. Michele da Piazza, a Franciscan friar, wrote that the sailors had "such a disease in their bodies that if anyone so much as spoke with one . . . he was infected." When they realized the crew had brought a plague to town, authorities expelled the Genoese.

It was too late. *Yersinia pestis* had landed.

The plague preys on humans in many ways. Bubonic is the most common form, transmitted by a flea bite. Once *Yersinia pestis* enters the bloodstream, the bacterium drains to lymph nodes in the groin, armpit, or neck.

An infected person feels a "kind of chilly stiffness." Their body tingles as if "being pricked by the points

of arrows." Next, egg-shaped tumors, or buboes, swell up over the lymph nodes. These are caused by bleeding under the skin, which turns the skin black.

A Welshman described the painful boils on his body in 1349. "It is of the form of an apple, like the head of an onion. . . . Great is its seething, like a burning cinder, a grievous thing of an ashy color."

These grotesque swellings are accompanied by a high fever, vomiting, and diarrhea. As the nervous system begins to fail, the victim's limbs move in bizarre patterns and pain ricochets through the body.

No one had ever seen an illness like this before.

Infected people not only looked like death, they reeked of it, too. One man who visited his dying friend wrote, "The stench [of] sweat, excrement, and breath was overpowering." Purplish splotches appeared on the chest and back of victims. People labeled these "God's tokens," because the marks meant death would soon follow. As horrible as the bubonic plague looked and smelled, about 40 percent of people who contracted it survived.

Determined to kill more victims, *Yersinia pestis* evolved. In some people, it managed to break out of the lymphatic system and invade the lungs. At this point, the bubonic plague became the pneumonic plague.

Victims coughed up blood, splattering *Yersinia pestis* into the air. The bacteria soared through space looking for a human to land on. If untreated, the pneumonic plague is almost 100-percent fatal.

As *Yersinia pestis* raced through Messina, the city became a ghost town. No children played on the beaches. Shopkeepers locked their doors and shuttered their windows. Church pews sat empty and streets were deserted.

Bacteria infected peoples' bodies, but fear sickened their souls. Friar Michele recorded, "Soon men hated each other so much that if a son was attacked by the disease, his father would not tend him."

The dying suffered alone, abandoned even by priests too frightened to enter the homes of the ill to hear peoples' deathbed confessions. Corpses rotted as terrified Messinians fled the city, seeking refuge across Sicily.

They unknowingly took *Yersinia pestis* along.

Yersinia pestis galloped through Italy during the winter and spring of 1348. It followed trade routes and the trail left by terrified Messinians. Although the responses of pestilence and people followed similar patterns, each community's reaction was unique.

When the plague arrived in the floating city of Venice in January 1348, the city's response was organized and ruthless. All ships entering the harbor were boarded and searched. Vessels with foreigners or corpses were set on fire.

In order to maintain order, Venice's city council shut down all taverns. Anyone selling liquor without permission was fined and their wine dumped into the sea.

Public gondolas navigated canals between houses each morning, crying "Bring out your dead." The convoys transported bodies to nearby islands for burial. Despite these strategies, Venice's death toll rose and morale plummeted.

In an effort to boost spirits, city leaders banned people from wearing black and pardoned imprisoned criminals. But *Yersinia pestis* was heartless. The Black Death killed 72,000 Venetians, about 60 percent of the city's population.

Hunting fresh blood, *Yersinia pestis* moved inland. Florence, the once grand city where modern banking had been invented, had fallen on hard times. In 1345, rains flooded the city. The following year brought a financial crisis. Then, in 1347, famine struck. The city wore a cloak of misery.

Nothing, however, had prepared Florence for *Yersinia pestis*.

One cloudy March morning in 1348, the pestilence crept under the city walls. Pausing momentarily, *Yersinia pestis* gazed appreciatively at Florence's stunning art and architecture. Then, it pounced.

Florentine writer Giovanni Boccaccio recorded *Yersinia pestis*'s visit. "It would rush upon its victims with the speed of a fire racing through dry or oily substances. . . ."

The plague's speed heightened peoples' terror until it became a hysteria. The healthy ran from the sick. According to Boccaccio, "Brothers abandon brothers, uncles their nephews, sisters their brothers, and . . . wives deserted husbands. But even worse . . . fathers and mothers refused to nurse . . . their own children."

Florence's famous beauty vanished, replaced by a mask of death.

People dropped dead in the street, their bodies left where they had fallen. A rank odor coming from windows notified passersby that someone in the neighborhood had died. Huge burial trenches were dug in churchyards. Marchionne di Coppo Stefani described how corpses were dropped into these pits, "layer upon layer just like one puts layers of cheese on lasagna."

An eerie silence fell over Florence. This was a city full of churches, and in normal times, the bells pealed three times a day, plus when someone died.

An illustration from a fourteenth-century
Belgium manuscript, author unknown

When *Yersinia pestis* turned these death chimes into a continuous clang, the city council ordered the bells silenced. But the end of the music did not stop *Yersinia pestis* from killing.

The Great Mortality claimed 50,000 Florentines before it left the city—50 percent of the population. Europeans were desperate for a cure.

Medieval medicine was based as much on superstition and tradition as on science. European doctors relied on theories that had been developed by the ancient Greeks centuries earlier.

Few doctors had formal training and the scientific method did not yet exist.

In 1348, desperate to understand what caused *Yersinia pestis*, doctors at the University of Paris wrote the *Compendium de Epidemia*. They concluded the plague was caused by bad air. Their theory was based on astrology.

The scientists had observed that on March 20, 1345, three planets in the Aquarius constellation were aligned. One of these, Mars, was "a malevolent planet, breeding anger and wars. . . ." and it "looked upon Jupiter with a hostile aspect."

The alignment of these planets sucked up "evil vapors," which winds carried to Earth. When inhaled, bad air can "penetrate quickly to the heart and lungs to do its damage."

This explanation was little help since Europeans could not just hold their breath until *Yersinia pestis* left town. Instead, doctors proposed creative, although not successful, solutions. Stay away from marshes and swamps, where the air was thick. Open north-facing windows to let in the dry air. Cover up windows that face the hot, humid south.

The physician John Colle noted that the people who cleaned public latrines seemed less likely to contract the plague than the general population. Therefore, Colle argued, the best cure for bad air was more bad air. This theory led people to circle around public outhouses and inhale deeply.

Sniffing latrines was not the only treatment for this terrifying disease.

People ate crushed emeralds, chopped up raw onions and scattered them around the house, and drank their own urine. They placed live pigeons or frogs on the boils and covered burst buboes with poultices that included figs, butter, onions, and dried human feces. None of these "cures" halted *Yersinia pestis*'s murderous march through Europe.

When Italy had been decimated, *Yersinia pestis* decided to try French food.

The southern coastal city of Marseille became an urban hub from which the disease could wrap a hangman's noose around the entire continent.

Southwest to Spain, north toward England, a sharp right into the Low Countries, and from there to Scandinavia, Germany, Poland, and finally Russia by 1352. The only European countries *Yersinia pestis* spared were Iceland and Finland. These nations likely escaped because they had small populations and little contact with the rest of Europe.

While Europeans died by the millions, a manhunt began. This search for *Yersinia pestis* was not led by doctors or scientists. It was led by anti-Semites—people who discriminate against Jewish people.

April 13, 1348, was Palm Sunday, the beginning of Holy Week for European Christians. That evening, Christian residents of the seaside village of Toulon, France, attacked their Jewish neighbors.

As darkness fell, mobs burst into Jewish houses. Crazed people broke windows and overturned furniture. They dragged Jewish men, women, and children from bed, hauling them into the streets, where they were taunted, beaten, and killed.

The following morning, the bodies of 40 Jews hung from poles in the town square.

Anti-Semitism had long roots in Europe. The majority of the population was Christian, and they blamed the Jewish minority for the death of Jesus, the Christian messiah. Jesus was executed by Romans in the Jewish holy city of Jerusalem back in 33 CE.

The Christian church dominated Europe, its rules as powerful as those of any monarch. These rules applied to Jews even though they practiced a different religion. Jews had to wear distinctive clothing, such as yellow badges or red hats. They were barred from owning land and practicing certain occupations. Some towns refused to allow any Jewish residents, and many cities required Jews to live in a walled-off section known as a ghetto.

Already viewed as separate and suspect, the Jews made an easy scapegoat during a crisis.

As *Yersinia pestis* raced across northern Europe, rumor sprinted ahead of it. The plague, people whispered, was part of an international Jewish conspiracy to take over the world.

"The Jews have poisoned Christian wells," a shopkeeper said to a shoemaker. "The poison is the size of an egg," the shoemaker said to the mayor. "Nay," said the mayor. "The size of a fist." "I heard it was as big as two fists," whispered a housewife.

This two-fisted poison was rumored to be made of lizards. Or was it frogs and spiders?

No, claimed the most devilish rumor—the Jewish poison contained the hearts of Christians.

This gossip spread across France, Germany, and Switzerland like a herald in advance of *Yersinia pestis*. Jews were arrested and hauled before authorities to be "put to the question," another phrase for torture. If the person did not confess to being part of the conspiracy, a guard placed a crown of thorns on his head and smashed it into his skull with a club. Jews quickly "admitted" to being part of the poison plot. They lied simply to end the torture.

Such a conspiracy never existed.

Yersinia pestis targeted Jewish Europeans as viciously as their Christian neighbors. That fact did not matter to the Christians who beat Jews with

spikes. An estimated 20,000 European Jews died during the Great Mortality, slain by the two demons of pestilence and prejudice.

In 1352, *Yersinia pestis* reached Moscow, Russia, and gnawed through the population with deadly speed. Then, this mass murderer pushed back its plate and decided it was full. Moscow is approximately 700 miles from Caffa, the city where the Great Mortality had begun.

When Europeans realized the plague had gone, they celebrated. Men and women drank and spent money. They had survived the apocalypse and embraced life with gusto.

But *Yersinia pestis* had altered their world. The church had failed them. Prayer had not saved them. People became skeptical of church authority and were open to considering different religious ideas.

The economy went through a fundamental shift after *Yersinia pestis* left town. Fields lay unplanted, farms abandoned, fences and bridges fell apart. There were not enough laborers to tend the land. Peasants who had survived the plague no longer had to take dirt wages offered by upper-class landowners. They demanded more money and began to purchase their own land and fight for more rights.

Medicine evolved as well. No longer were doctors content to rely on theories developed during ancient times. They began to propose new ideas and test these concepts with observable and measurable data. The scientific method was born.

Although Europe changed, these changes did not keep *Yersinia pestis* away forever. Like the villain in a horror movie, it returned in 1361. For the next 300 years, waves of the plague rolled over the continent. The death toll was never as high as it had been during the Great Mortality, but *Yersinia pestis* refused to disappear.

According to the World Health Organization, from 2010 through 2015 there were 3,248 cases of two different kinds of plague in humans, and 584 of these people died. Though tragic, these numbers pale in comparison to the slaughter of the fourteenth century. Antibiotics and improved hygiene and sanitation keep the monster in check—but never forget that it is still around. Anyone planning to travel to a place where rats and marmots thrive should heed this warning: *Be vigilant.* Yersinia pestis *lurks inside these rodents' fur, waiting for the chance to strike again.*