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Medieval “Black Death” Was Airborne, Scientists Say

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The so-called Black Death arrived in Britain from central Asia in the autumn of 1348. Believed to be bubonic plague, spread by infected fleas carried on rats, the disease swept through Europe over the better part of the next year. One of history’s most devastating epidemics, it killed an estimated 75 million people, including six in every 10 Londoners. Now, analysis of skeletal remains found by construction workers digging railway tunnels in central London has led scientists to a stunning new conclusion: The Black Death was not transmitted through flea bites at all, but was an airborne plague spread through the coughs, sneezes and breath of infected human victims.



One of the skeleton's discovered buried beneath London's Charterhouse Square. After construction workers digging tunnels for the new Crossrail train line last year discovered some 25 skeletons buried under Charterhouse Square in the Clerkenwell area of London, scientists immediately suspected they had stumbled on a plague cemetery. The square, once home to a monastery, is one of the few London areas that have remained undisturbed for hundreds of years, and the location outside the walls of medieval London coincided with historical accounts. To test this theory, scientists extracted DNA from one of the largest teeth in each of 12 skeletons. Testing showed evidence of *Yersinia pestis*, the bacterium that causes the plague, which confirmed that the individuals buried underneath the square had likely been exposed to—and died from—the Black Death.

Currently, the plague still infects several thousand people every year around the world, though most patients recover if treated early enough with

antibiotics. When they compared the strain of plague preserved in this medieval DNA with the strain that recently killed some 60 people in Madagascar, however, they found something surprising. The medieval strain was no stronger than the recent one; in fact, their genetic codes matched almost exactly.

Scientists at Public Health England in Porton Down, argue that for the Black Death to have spread so quickly and killed so many victims with such devastating speed, it would have to have been airborne. Therefore, rather than bubonic plague, which is transmitted to humans through bites from infected rat fleas, they concluded that this must have been a pneumonic plague that made its way into the lungs of the infected and spread through coughs and sneezes.

Analysis of wills registered in the medieval City of London has shown that 60 percent of Londoners were wiped out by the Black Death from the autumn of 1348 to spring of 1349. A comparable rate of destruction would today kill some 5 million people. According to Dr. Tim Brooks from Porton Down, transmission by rat fleas as an explanation for the Black Death “simply isn’t good enough. It cannot spread fast enough from one household to the next to cause the huge number of cases that we saw during the Black Death epidemics.”

Archaeological analysis of the bones found under Charterhouse Square also revealed that the individuals buried there were mostly poor people who suffered from general ill health. Rickets, anemia and tooth decay were common, as well as childhood malnutrition, which was consistent with the “Great Famine” that struck Europe some 30 years before the plague. Many of the skeletons showed back damage, suggesting lives marked by hard physical labor.

Another interesting finding was that the remains in the square appeared to come from three different periods: not only from the original Black Death epidemic in 1348-1350, but from later outbreaks in 1361 and the 1430s. While the early burials at the site are orderly, including white shrouds around the skeletons, the ones from the 1430s show evidence of upper-body injuries, consistent with what appears to have been a time of increasing lawlessness and social chaos. Archaeologists planning another dig in the area this summer estimate that thousands of bodies are left to be found underneath Charterhouse Square.