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What caused the potato famine of Ireland

Back to Voices The Irish Potato Famine During the summer of 1845, a "blight of unusual character" devastated Ireland's potato crop, the basic staple in the Irish diet. A few days after potatoes were dug from the ground, they began to turn into a slimy, decaying, blackish "mass of rotteness." Expert panels convened to investigate the blight's cause suggested that it was the result of "static electricity" or the smoke that billowed from railroad locomotives or the "mortiferous vapours" rising from underground volcanoes. In fact, the cause was a fungus that had traveled from Mexico to Ireland. "Famine fever"—cholera, dysentery, scurvy, typhus, and infestations of lice—soon spread through the Irish countryside. Observers reported seeing children crying with pain and looking "like skeletons, their features sharpened with hunger and their limbs wasted, so that there was little left but bones." Masses of bodies were buried without coffins, a few inches below the soil. Over the next ten years, more than 750,000 Irish died and another 2 million left their homeland for Great Britain, Canada, and the United States. Within five years, the Irish population was reduced by a quarter. The Irish potato famine was not simply a natural disaster. It was a product of social causes. Under British rule, Irish Catholics were prohibited from entering the professions or even purchasing land. Instead, many rented small plots of land from absentee British Protestant landlords. Half of all landholdings were less than 5 acres in 1845. Irish peasants subsisted on a diet consisting largely of potatoes, since a farmer could grow triple the amount of potatoes as grain on the same plot of land. A single acre of potatoes could support a family for a year. About half of Ireland's population depended on potatoes for subsistence. The inadequacy of relief efforts by the British Government worsened the horrors of the potato famine. Initially, England believed that the free market would end the famine. In 1846, in a victory for advocates of free trade, Britain repealed the Corn Laws, which protected domestic grain producers from foreign competition. The repeal of the Corn Laws failed to end the crisis since the Irish lacked sufficient money to purchase foreign grain. In the spring of 1847, Britain adopted other measures to cope with the famine, setting up soup kitchens and programs of emergency work relief. But many of these programs ended when a banking crisis hit Britain. In the end, Britain relied largely on a system of work houses, which had originally been established in 1838, to cope with the famine. But these grim institutions had never been intended to deal with a crisis of such sweeping scope. Some 2.6 million Irish entered overcrowded workhouses, where more than 200,000 people died. The Irish Potato Famine left as its legacy deep and lasting feelings of bitterness and distrust toward the British. Far from being a natural disaster, many Irish were convinced that the famine was a direct outgrowth of British colonial policies. In support of this contention, they noted that during the famine's worst years, many Anglo-Irish estates continued to export grain and livestock to England. Scientists have long known that it was a strain of *Phytophthora infestans* (or *P. infestans*) that caused the widespread devastation of potato crops in Ireland and northern Europe beginning in 1845, leading to the Irish Potato Famine. *P. infestans* infects the plant through its leaves, leaving behind shriveled, inedible tubers. The most likely culprit, they believed, was a strain known as US-1, which even today is responsible for billions of dollars of crop damage each year. To solve the mystery, molecular biologists from the United Kingdom, Germany and the United States examined DNA extracted from nearly a dozen botanical specimens dating back as far as 1845 and held in museum collections in the UK and Germany, which were then sent to the Sainsbury Laboratory in Norwich, England. After sequencing the genome of the 19th century samples and comparing them with modern blights, including US-1, they were able to trace the genetic evolution of *P. infestans* around the world and across centuries. The researchers concluded that it wasn't in fact US-1 that caused the blight, but a previously unknown strain, HERB-1, which had originated in the Americas (most likely in Mexico's Toluca Valley) sometime in the early 19th century before spreading to Europe in the 1840s. HERB-1, they believe, was responsible for the Great Famine and hundreds of other potato crop failures around the world. It wasn't until the early 20th century that improvements in crop breeding yielded potato varieties that proved resistant to HERB-1 that the deadly infection was stopped in its tracks. Scientists believe that the HERB-1 strain is now extinct. First domesticated in southern Peru and Bolivia more than 7,000 years ago, the potato began its long trek out of South America in the late 16th century following the Spanish conquest of the Inca. Though some Europeans were skeptical of the newly arrived tuber, they were quickly won over by the plant's benefits. Potatoes were slow to spoil, had three times the caloric value of grain and were cheap and easy to grow on both large farms and small, backyard lots. When a series of non-potato crop failures struck northern Europe in the late 18th century, millions of farmers switched to the more durable spud as their staple crop. Nowhere was dependency on the potato more widespread than in Ireland, where it eventually became the sole subsistence food for one-third of the country. Impoverished tenant farmers, struggling to grow enough food to feed their families on plots of land as small as one acre, turned to the potato en masse, thanks to its ability to grow in even the worst soil. Requiring calorie-heavy diets to carry out their punishing workloads, they were soon consuming between 40 and 60 potatoes every day. And the potato wasn't just used for human consumption: Ireland's primary export to its British overlords was cattle, and more than a third of all potatoes harvested were used to feed livestock. By the early 19th century, however, the potato had begun to show a tendency toward crop failure, with Ireland and much of northern Europe experience smaller blights in the decades leading up to the Great Famine. While the effects of these failures were largely ameliorated in many countries thanks to their cultivation of a wide variety of different potatoes, Ireland was left vulnerable to these blights due to its dependence on just one type, the Irish Lumper. When HERB-1, which had already wreaked havoc on crops in Mexico and the United States, made its way across the Atlantic sometime in 1844, its effect was immediate—and devastating. Within a year, potato crops across France, Belgium and Holland had been affected and by late 1845 between one-third and one-half of Ireland's fields had been wiped out. The destruction continued the following year, when three-quarters of that year's harvest was destroyed and the first starvation deaths were reported. As the crisis grew, British relief efforts only made things worse: The emergency importation of grain failed to prevent further deaths due to Ireland's lack of working mills to process the food; absentee British landlords evicted thousands of starving peasants when they were unable to pay rent; and a series of workhouses and charity homes established to care for the most vulnerable were poorly managed, becoming squalid centers of disease and death. By 1851 1 million Irish—nearly one-eight of the population—were dead from starvation or disease. Emigration from the country, which had steadily increased in the years leading up to the famine, ballooned, and by 1852 million people had fled, swelling the immigrant Irish populations of Canada, the United States, Australia and elsewhere. Even today, more than 150 years later, Ireland's population has still not recovered its pre-famine level. Those that stayed behind, haunted by their country's suffering, would form the basis of an Irish independence movement that continued into the 20th century. America: Promised Land The 2-part special premieres Memorial Day at 9/8c on HISTORY. In 2013, an international team of scientists finally identified the strain of potato blight that caused the potato crops of Ireland to fail, spurring on genocidal negligence on behalf of the British and leading to a million deaths and mass starvation, and two million Irish migrants fleeing the country. It has been known that *Phytophthora infestans*, a fungus-like organism that devastated potato crops, led to the famine in Ireland. But the precise strain of the pathogen that caused the devastating famine from 1845 to 1852 was a mystery until 2013, when the strain of potato blight was christened HERB-1 by the biologists. Study co-author Hernán Burbano, a researcher at the Max Planck Institute for Developmental Biology in Germany, said in a statement: "We have finally discovered the identity of the exact strain that caused all this havoc." The report says that a *Phytophthora* strain called US-1 was thought to have triggered the potato famine. But, by sequencing the genomes of preserved samples of the plant pathogen, the researchers discovered that a different strain, new to science, was the real culprit. Researchers studied 11 historic samples from potato leaves that were collected about 150 years ago in Ireland, the United Kingdom, Europe, and North America. The ancient samples, preserved at the Botanical State Collection Munich and the Kew Gardens in London, still had many intact pieces of DNA. The DNA quality was so good the researchers were able to sequence the entire genome of *Phytophthora infestans* and its host, the potato, within just a few weeks. Johannes Krause, a professor of paleogenetics at the University of Tübingen in Germany and a study co-author, said: "The degree of DNA preservation in the herbarium samples really surprised us." The decoded genomes were compared with modern *Phytophthora* strains from Europe, Africa, and the Americas and the results enabled the researchers to trace the evolution of the pathogen, including where and when the HERB-1 and US-1 strains likely diverged. Their report determined that *Phytophthora infestans* originated in Mexico's Toluca Valley. When Europeans and Americans first came to Mexico in the 16th century, the pathogen experienced increased genetic diversity, and in the early 1800s, the HERB-1 *Phytophthora* strain emerged and was brought out of Mexico, the researchers said. They added that by the summer of 1845, the HERB-1 strain had arrived at European ports, and the potato disease spread throughout Ireland and the United Kingdom, causing the Irish potato famine. In the 20th century, as new varieties of potatoes were introduced, the HERB-1 strain was eventually replaced by the US-1 *Phytophthora* strain, the researchers said. The study says the evolutionary change may have been spurred by the introduction of new crop breeding methods, which suggests that breeding techniques may affect the genetic makeup of plant pathogens. Lead author Kentaro Yoshida, a researcher at The Sainsbury Laboratory in the United Kingdom, speculated: "Perhaps this strain became extinct when the first resistant potato varieties were bred at the beginning of the twentieth century. "What is for certain is that these findings will greatly help us to understand the dynamics of emerging pathogens. This type of work paves the way for the discovery of many more treasures of knowledge hidden in herbaria." * Originally published in 2016. IrishCentral History Love Irish history? Share your favorite stories with other history buffs in the IrishCentral History Facebook group.

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