

## The Little Ice Age and us

By Gwynne Dyer

The Black Death killed about 30% of the European population in a few years in the middle of the 14th century. A century and a half later the native people of the Americas were hit by half a dozen plagues as bad as the Black Death, one after another, and 95% of them died. The plagues of the 'Great Dying' had much less terrifying names like measles, influenza, diphtheria and smallpox, but they were just as efficient at killing.

When the tens of millions of native Americans died, the forests grew back on the land they used to farm. All those forests absorbed so much carbon dioxide that the average global temperature dropped, and what would otherwise have been a minor cyclical cooling became the Little Ice Age. It got so cold that lots of Europeans starved to death - so maybe there is such a thing as 'climate justice' after all.

The lead researcher of the team at University College London who joined up all these dots is doctoral candidate Alexander Koch. (He hasn't even got his PhD yet.) He borrowed the phrase 'The Great Dying' from the paleontologists, who use it to describe the mass extinction event at the end of the Permian era 252 million years ago, the worst of them all. It works just as well for human beings.

When Christopher Columbus arrived in the Caribbean in 1492, there were about 60 million people living in the Americas, and 99% of them were already farmers. Eurasian civilisations had a bit of a head start on them - iron tools, ocean-going ships, even gunpowder - but their numbers and their economies were very similar: there were 70 or 80 million Europeans, and most of them were farmers too.

A century later there were only 6 million native Americans left: a 90% fatality rate. Yet at that time, there were still only about a quarter-million Europeans in the Americas. They clearly couldn't have killed the other 54 million natives - but their diseases did.

The problem was that the native Americans had absolutely no inherited resistance to the quick-killer Eurasian diseases that the Europeans brought with them. Those diseases had emerged in the densely populated countries of Europe and East Asia one at a time over thousands of years, passing from the herds and flocks of domesticated animals to their human owners, who now also lived in herd-like conditions.

Each one of these new diseases killed millions before the survivors developed some resistance, but the Asian, European and African populations had time to recover before the next one emerged. The native Americans got all the plagues at once, and they had no comparable plagues of their own to give back to the invaders because they didn't keep large herds of animals.

What really interests Alexander Koch and his colleagues is that this caused the largest abandonment of farmland in all history. The six million survivors didn't need all those farms, so the forests came back quickly. As they grew they absorbed huge amounts of carbon dioxide, cutting the amount in the global atmosphere by about ten parts per million (10 ppm).

That dropped the average global temperature, which was already a little lower than usual because of cyclical changes in the Earth's orbit. The Little Ice Age lasted for more than 200 years and probably caused a couple of million extra deaths in local famines in Eurasia, so at least a little bit of the misery travelled the other way.

But our impact on the environment has now grown so large that a 10 ppm cut in our emissions is almost meaningless. We are currently adding around 10 ppm of carbon dioxide to the atmosphere every four years.

On the other hand, if we were to reforest all the land that was cleared around the world in the past 150 years but is not prime agricultural land, we could sequester 50 ppm of carbon dioxide. That might win us the time we need to get our carbon emissions

down without triggering runaway warming.

Instead, the Brazilians elect Jair Bolsonaro to clear-cut the Amazon, and the United States elects Donald Trump to outsource U.S. climate policy to the fossil fuel industry. We know a great deal more than the native Americans did about the elements that would decide their fate, but we may be no better than they were at avoiding it.