Climate Change, Chaos, and The Little Ice Age - Crash Course World History 206

Crash Course: World History
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John Green: Hi. I'm John Green. This is Crash Course World History and today we're going to talk about climate change.

John Green From the Past: Mr. Green, Mr. Green, that's not history; that's science, and also, I don't think that's even happening.

John Green: Yeah, two things, Me From the Past: One, uh, contemporary climate change is real. Uh, two, this isn't the first time the world has experienced disruptive climate change, believe it or not.

[Opening Crash Course theme plays]

John Green: So, climate change, of course, can be a very controversial topic, at least here in the US, but we're not discussing today whether contemporary climate change is caused by human activity, although it is. We're talking about history, and history is never controversial.

We know that climate change can happen because it has happened. In fact, although we're living in an age of global warming today, for most of the early modern period, the globe experienced cool temperatures. Some historians have called this the Little Ice Age, which would make a great animated movie. Someone should get on that. Anyway, good job, historians, giving something an evocative name for once. I'm picturing a tiny little ice ball, like a snow globe.

Apparently, the Earth was regular-sized back then, but anyway, the Little Ice Age lasted from the thirteenth through the nineteenth centuries and it was a period when average temperatures were cooler than they are now. This doesn't mean that it was always cold, though; there were volatile shifts between bitterly cold winters and wet summers and long droughts. Also, weather conditions were not always the same in all parts of the world, kind of like how the winter of 2014 was terribly cold in the United States but still one of the warmest on record worldwide. Climate is not weather.

So, we know temperatures were colder partly because of science but also because of history. Science has shown through the study of stuff like tree rings and ice cores that it really was colder back then. But we also know this from history. I mean, records kept at the time by monks, wine-makers, and others also reported cold weather and bad harvests. Bad harvests are crucial to our understanding of the Little Ice Age because they were catastrophic events, bringing hunger and, in some cases, starvation to millions of people. And because they were so catastrophic, people wrote about them, which leaves us a historical record.

Less food meant more disease and also more crime. Poor harvests often led to civil unrest, especially bread riots. For some, a sensible strategy was to hit the road or, in the case of the Norseman, hit the sea. In fact, sometime during this period, their search for better fishing grounds led them to America.

And humans also prove very innovative when adapting to new climate extremes. One example near to my heart is the Netherlands, where people developed water control systems and experimented with new agricultural technology to make farms less vulnerable to terrible weather events like floods.

But the Little Ice Age led to unpredictable harvests around the world and without, like, Spam to fall back on, a couple bad harvests in a row was fatal.

So, the whole Little Ice Age was pretty bad but the seventeenth century was the worst. Some historians even refer to it as a period of global crisis. I mean, here are just a few examples of the political instability in the seventeenth century: the English revolutions of 1640 and 1689, Spain's European Wars and debt problems, peasant and urban worker uprisings in Italy, the fall of the Ming and the rise of the Qing Dynasties in China, a succession crisis in the Ottoman Empire, wars between colonists and Native Americans that nearly destroyed Britain's colonies, the Mughal Wars of Succession, oh, and the Thirty Years War. And that's not even to mention Shakespeare. No Little Ice Age, no Shakespeare. That's what I would argue. Totally a climate-dependant writer. I would be just as good as him if only we were in a period of climate change.

Now, obviously, we can't say that all of these upheavals were caused by cooler temperatures, but they did correlate with them, and in many cases, weather contributed to them. Unrest was often linked to food shortages and taxes. The taxes were high and the food was short because the harvests were bad.

Now, for many people in the seventeenth century, the cause of the calamitous bad weather was obvious: human sinfulness. As Welsh historian James Howell wrote in 1647, "God Almighty has a quarrel lately with all mankind, and given the reins to the ill spirit to compass the whole Earth." Others blamed bad weather on witches, always a safe bet, or on natural phenomena like eclipses, earthquakes, comets, or sunspots. And they might not have been totally wrong. Well, they were totally wrong about the witches, but-but there were fewer recorded sunspots, especially in 1617 and 1618, when the Thirty Years War began. Oh, and there were twelve volcanic eruptions between 1638 and 1644, which produced dust veils that might have made the whole planet cooler.

The weather in the middle of the seventeenth century, right around the time of the English Revolution, was especially bad, like in Massachusetts, 1642 was so cold that the bay froze, while in Indonesia, the droughts caused rice harvests to fail. Much of Africa faced droughts between 1640 and 1644 and in 1643, flooding in the Low Countries was so bad that cows and chickens ended up in trees. And Scandinavia recorded its coldest winter ever in 1641. And these changes in weather were profoundly disruptive because much more than today, people depended directly on agriculture, and thus the weather, for their livelihoods. Let's go to the Thought Bubble.

So, according to historian Thomas C. Smith, "Farming, with its allied tasks, was the principal occupation and nearly the sole source of income for most families, and its rhythms defined the annual cycle of work, rest and worship. Severe annual variations in the harvest reverberated through family life..." According to Geoffrey Parker, a fall of two degrees Celsius during the growing season, precisely the scale of global cooling in the 1640s, reduces rice harvest yields by between thirty and fifty percent. "In latitudes north of the temperate zone,' each fall of 0.5 degrees Celsius in mean summer temperature decreases the number of days on which crops ripen by 10 per cent, doubles the risk of a single harvest failure, and increases the risk of a double failure six fold." Harvest failures led to food shortages which led to everything from stunting via malnutrition to rising food prices. A 30 percent reduction in the grain harvest often doubled the price of bread, whereas a fifty percent reduction quintupled it. And when people have to spend more on food, they don't have money to spend on other stuff, which means the people who make that other stuff are suddenly unemployed and hungry. And then, hunger itself reduced the amount of available food by diminishing people's capacity to work, since a decrease from 2,500 to 2,000 calories halves our ability to work efficiently because the body's basic metabolism still requires 1,500 calories. And hungry people are also more susceptible to disease. Add together floods, droughts, harvest failures, and disease, and you get a vicious cycle leading to population decline, which is exactly what happened in the seventeenth century.

Thanks, Thought Bubble. So, all of that is pretty horrible, but human

suffering in the seventeenth century wasn't just caused by cold and drought. There was also a lot of war going on. And these wars between and within states multiplied the effects of hunger as soldiers looted wherever they went. Like the Chinese even coined a word for soldiers' bad behavior: binghuo, which means "soldier calamity". And then, to add injury to injury, the costs of most of these wars were borne by the peasants, who suffered doubly as their taxes went to pay for the king's wars, which brought soldier calamity. These taxes were often on staples like bread, and so they often led to bread riots, which were not great for morale.

And yes, terrible weather could even contribute to the fall of dynasties. The 1641 drought in China was so bad that the Grand Canal began to dry up for the only time in history, which reduced rice shipments to China's capitol. Unable to feed the people, the Ming emperor surrendered to the Qing in 1644. Drought and cold had also encouraged the Qing to overthrow the Ming in the first place as poor harvests in Manchuria convinced their leaders that invading China was the only way to avoid catastrophe. And then the Qing got to China and they were like, "Where's all your food?" and they were like, "Yeah, the whole planet is colder, not just Korea." But then they were already there so they decided to have a dynasty for a while. I am your history teacher.

So, obviously, protests and rebellions were public responses to the hunger and war, but many people confronted the problem of hunger by trying to reduce the number of mouths they had to feed. They could do this by reducing the number of births through postponed marriage or, in more extreme cases, through infanticide. And the most desperate resorted to suicide. Now, we don't have many records of suicide rates, but a Qing decree of 1688 forbidding widows from killing themselves suggests that it was widespread.

And speaking of widows, wars compounded the problem by creating lots of them, like in Europe, the Thirty Years War led to a rise in the number of households headed by women. Women also took the lead in reducing the number of mouths to feed by delaying marriage. Like, whenever bread prices rise, rates of marriage fall.

And the last thing that I'll mention here is that bad weather and poor harvests also prompted migration. Like, in the first half of the seventeenth century, perhaps one half of all adult Scotsmen left Scotland. Many Chinese left for the Philippines, Indonesia, and Taiwan.

So, we have a world that's dramatically different because of the climate change of the Little Ice Age. Women head more households, many communities are more ethnically diverse, population growth slowed dramatically, and there was widespread political unrest and wars and starvation. And, of course, looking at the history of the Little Ice Age is relevant for us today as we face a change in climate and the extreme weather that comes with it.

Sometimes, we like to imagine that math and science don't really have much to do with the humanities, that, like, how we live in the world isn't really shaped by our environment. But, of course, it is. We are shaping our environment. Our environment is also shaping us.

To end on a hopeful note, the agricultural innovations that developed in the face of tremendous weather-related challenges should remind us that it is possible to adapt to change in climates if we make the effort and take the time. We don't know what the cast iron plows of the future are going to be, but we do know that we're going to need them. Thanks for watching. I'll see you next week.

[Closing Crash Course theme plays]

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