HD **Largest volcanic eruption in human history changed the 19th century as much as Napoleon**

BY Gillen D'Arcy Wood, Director of Sustainability Studies Initiative in the Humanities, Professor of English at University of Illinois at Urbana-Champaign

WC 1,198 words

PD 7 April 2014

SN The Conversation

SC CONVAU

LA English

LP

Most have heard of the Battle of Waterloo, but who has heard of the volcano called Tambora? No school textbook I've seen mentions that only two months before Napoleon's final defeat in Belgium on June 18, 1815, the faraway Indonesian **island** of Sumbawa was the **site** of the most devastating volcanic eruption on Earth in thousands of years.

The death toll claimed around 100,000 people, from the thick pyroclastic flows of lava, from the tsunami that struck nearby coasts, and from the thick ash that blanketed South-East Asia's farmlands, destroyed crops and plunged it into darkness for a week. Both events – Napoleon's defeat and the eruption – had monumental impacts on human history. But while a library of scholarship has been devoted to Napoleon's undoing at Waterloo, the scattered writings on Tambora would scarcely fill your in-tray.

TD

This extraordinary geological event took place 199 years ago this week, and on the cusp of its bicentenary Tambora is finally getting its due. With the help of modern scientific instruments and old-fashioned archival detective work, the Tambora 1815 eruption can be conclusively placed among the greatest environmental disasters ever to befall mankind. The floods, droughts, starvation, and disease in the three years following the eruption stem from the volcano's effects on weather systems, so Tambora stands today as a harrowing case study of what the human costs and global reach might be from runaway climate change.

Tambora's greatest claim to infamy lies not in the impact it had on what was then the Dutch East Indies (which were terrible enough), but its indirect effects on the disease ecology of the Bay of Bengal. The enormous cloud of sulfate gases Tambora ejected into the atmosphere slowed the development of the Indian monsoon, the world's largest weather system, for the following two years.

Drought brought on by the eruption crippled farmers across the Indian subcontinent, but more disastrously gave rise to a new and deadly strain of cholera. Cholera had been endemic to the Bengal region for centuries, but this new variant met with no resistance among the human population, spreading across Asia and eventually the globe. By century's end, the death toll from the Bengal cholera stood in the tens of millions.

Just as the biological disaster known as the Black Death defined the 14th century in Europe and the Near East, so cholera shaped the nineteenth century like no other calamity. Much of our medical science, and our modern public health institutions, originate in the Victorian-era battle against cholera. But only now, thanks to renewed scientific interest in the relation between cholera and climate change, can we make the connection between the worldwide cholera epidemic originating in 1817 and Tambora's eruption thousands of miles away.

https://62e528761d0685343e1c-f3d1b99a743ffa4142d9d7f1978d9686.ssl.cf2.rackcdn.com/files/45690/width668/f7wsjjdg-1396731372.jpg
Tambora's eruption was heard 2,000km away in Sumatra, and ash fell metres deep. Xavax, CC BY-SA

Tambora's ripple effects were felt across the globe. In southwest **China**, the outlying mountainous province of Yunnan suffered terribly from the cold volcanic weather, losing crop after crop of rice to bitter winds and flooding rains. The situation was so extreme that desperate Yunnanese resorted to eating white clay, while parents **sold** their children in the town markets, or killed them out of mercy.

In the aftermath of this three-year famine, Yunnan farmers turned to a more reliable cash crop – opium – to ensure their families' survival against future disasters. Within a few decades, opium was being grown all across Yunnan, while opium processing technology and expertise drifted south into the remote mountains of modern-day Burma and Laos. The "golden triangle" of international opium production was born.

If the Tambora disaster persists in cultural memory at all, it is as the “Year Without a Summer,” 1816, when crops failed across Europe and in New England, and Mary Shelley, stranded in a gloomy villa on Lake Geneva with the poets Percy Shelley and Lord Byron, wrote her storm-lashed classic Frankenstein. As it turns out, however, the indirect ripple effects of Tambora – what climate scientists call “teleconnections” – were even more historically significant. Cholera and opium are two examples, another is Arctic exploration.

One of the paradoxical effects of a major tropical eruption is that while the planet in general is cooled by the blanket of volcanic dust that drifts from the equator to the poles, the Arctic itself is drastically warmed owing to changes in wind circulation and north Atlantic ocean currents. This anomaly was only discovered after the 1991 eruption of Mount Pinatubo in the tropical Philippines, the first observed with the benefit of modern climatological instruments.

In 1817 and 1818, the British Admiralty began to receive exciting reports from whaling captains of a remarkable loss of sea ice in around Greenland. Huge icebergs from a broken icepack were spotted floating as far south as Ireland and New York. The prospect of a northwest passage for shipping to the East – a holy grail England had sought since Elizabethan times – beckoned once more. With a generation’s naval captains still hungry for glory but now languishing onshore after the defeat of Napoleon, the Admiralty launched an expensive and ultimately disastrous 50-year-long campaign to chart the elusive northwest passage.

The British could not have known then, of course, that Tambora had caused the Arctic to melt, and that the climatic impacts of a tropical eruption persist for no longer than three years. The Arctic refroze just in time for the arrival of Britain’s first polar expedition under Captain John Ross in 1818. Years of fruitless, icebound sallies into the polar seas culminated in the tragic Franklin expedition of the 1840s, when all hands were lost, and the heroic age of British Arctic exploration came to an end.

It is time to recognise Tambora as the Napoleon of eruptions. The implications – for historians – of a revised, volcanic nineteenth century are immense. As with the global cholera epidemic, and the growth of a **Chinese** opium empire, Victorian-era polar exploration might not have happened at all, or would have evolved in an entirely different direction, had it not been for Tambora’s climate-wrecking detonation in 1815.

For two long centuries, the connections between this major volcanic disaster and human history have been obscured by two factors: the limitations of scientific knowledge, and by our narrow, anthropocentric vision that seeks out only human causes for human events, neglecting the influence of environmental change. Now, in the 21st century, as we begin to appreciate more profoundly the interdependence of human and natural systems, the lesson of a 200-year-old climate emergency may finally be learned: a changing climate changes everything.

Gillen D'Arcy Wood does not work for, consult to, own shares in or receive funding from any **company** or organisation that would benefit from this article, and has no relevant affiliations.

NS gchlra : Cholera | gedu : Education | gcat : Political/General News | ghea : Health | gmed : Medical Conditions

RE austr : Australia | apacz : Asia Pacific | ausnz : Australia/Oceania

PUB The Conversation Media Group Limited

AN Document CONVAU0020140408ea470000s

