New book tells the story of a little-known volcano's global impact

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Gillen D'Arcy Wood, a professor of English, is the author of "Tambora: The Eruption That Changed the World," that documents the aftereffects of an 1815 volcanic eruption, the largest in recorded history. In his book, Wood describes the broad-ranging consequences, including climatic cooling, a worldwide cholera pandemic, a boom in opium production and an economic depression in the U.S. Credit: L. Brian Stauffer

(Phys.org) —The 200th anniversary of the largest volcanic eruption in recorded history will be marked by the publication of a new book by

University of Illinois professor Gillen D'Arcy Wood. If you think the title character might be Vesuvius, or Krakatoa, or maybe Pinatubo, you're wrong. Wood's focus is Tambora – a mountain in the Indonesian archipelago that erupted so violently in April of 1815 that today, it is ranked as "super colossal" on the scientific Volcanic Explosivity Index. And the explosion was only the first dose of Tambora's destructive power.

In his book, "Tambora: The Eruption That Changed the World" (to be published by Princeton University Press in April), Wood describes a cascade of aftereffects, ranging from climatic cooling that occurred as Tambora's immense ash cloud circled the globe, to less intuitive consequences, such as a worldwide cholera pandemic, a boom in opium production, a spike in arctic exploration and an economic depression in the U.S. The fact that people who lived through these chaotic consequences never realized they were caused by a remote volcano made Woods' research challenging.

"It was really detective work, connecting the dots," he said. "As a historian, I rely on contemporary documents from that period, and no one was making the connection at the time."

An English professor specializing in the Romantic era, Wood fell into this research in 2007 while auditing a U. of I. course in atmospheric sciences taught by professor Michael Schlesinger. The class frequently discussed volcanoes, because they can affect weather patterns, and Wood kept hearing the name "Tambora." One day, he stayed after class to ask Schlesinger about this particular volcano.

"Like a lot of fruitful human endeavors, this book originated in feelings of shame: I felt ashamed that I knew nothing about Tambora," Wood said. "Here I was supposed to be a scholar of the Romantic era, and 1815 is right in the heart of this period. Yet I didn't even know where this

volcano was."

Schlesinger explained that Tambora, on the island of Sumbawa, was rated a 7 on the VEI (by comparison, the 1980 eruption of Mount St. Helens rated a 5, Krakatoa a 6), and perfectly positioned, just 8 degrees north of the equator, to belch sulfur, fluorine and fine ash particles straight up into the stratospheric system of wind currents. For Wood, who had long been interested in climate change, this conversation was a light bulb moment.

"I just couldn't believe it," he said. "When I began trying to research Tambora, I found bits and pieces, but nobody had written about this as a major global event. It's as if this just landed in my lap." He spent the next five years researching this book.

The initial effects of the eruption, heard up to 1,200 miles away, were brutal and mercifully swift. Archaeologists in 2004 discovered that villages on Mount Tambora had been instantly buried under several meters of pumice and ash. In one home excavated by a team from the University of Rhode Island, a woman holding a knife (probably preparing a meal) had been instantly turned to charcoal, "evidence of immolation at far higher temperatures than those generated by Vesuvius," Wood writes. Magma pouring into the sea created clouds of steam and ash, generating a violent whirlwind that uprooted trees, ripped off roofs, and sucked people and livestock into the air. A British ship cruising nearby watched a 12-foot tsunami slam into the beach. Within days, fallout poisoned the island's wells, quickly adding another 40,000 deaths to the 10,000 or so villagers buried under the lava.

Tambora took an even larger toll in Europe and North America. Over the next three years, its aerosol film of stratospheric gasses set off a chemical chain reaction that caused a 5-6 degree Fahrenheit temperature decline in some places, resulting in crop failures, famine and more

deaths. In New England, 1816 was called "the year without a summer," but Wood's book also details devastation in places that were harder hit. In Germany, 1817 was called "the year of the beggar." In Switzerland, deaths outnumbered births in both 1817 and 1818.

In South Asia, Tambora's cloud had a different meteorological impact, delaying the annual monsoon season for the summer of 1816 and eventually altering the chemistry of the Bay of Bengal. Wood uses a combination of historic accounts and modern science to show how this climate change event produced a new and deadly strain of cholera that claimed 125,000 fatalities in Java before setting off on a slow, murderous journey around the world.

Each chapter of "Tambora" tackles another unexpected consequence of the eruption. Chapter Five, "The Seven Sorrows of Yunnan," sets up Yunnan as China's most temperate province, a flourishing agricultural zone, where the three frigid years following the eruption of Tambora defeated even these expert farmers, who planted five different strains of rice in an effort to adapt to the cold, to no avail. Wood writes: "Famished corpses lay unmourned on the roads; mothers sold their children or killed them out of mercy; and human skeletons wandered the fields, feeding on white clay."

Out of desperation, Yunnan farmers turned to another cash crop – opium. "If you're a farmer, you're not going to let your family starve. You're going to grow opium, which is a hearty crop," Wood said. "You can have multiple harvests, there's a big market for it, and you'll always have cash, even if your rice doesn't grow. It made absolute sense in Yunnan." By the early 20th century, Wood writes, 90 percent of Yunnan males were drug users, half were addicts, and China was the source of 80 percent of the world's narcotics.

Not all of Tambora's aftershocks were this bad. Wood credits the

volcano for the freakish "ice tsunami" in the Swiss Alps that inspired an engineer named Ignace Venetzro to publish a paper setting forth the founding principles of Ice Age theory. Wood also gives passing mention to Tambora's link to the invention of the bicycle, which was inspired by the dearth of service animals during the years of famine.

Wood populates each chapter with real human beings who documented the post-Tambora tragedy through letters, journals, poems or prose, including an account of his trip to Sumbawa to see Tambora firsthand. The adventure involved two days in a jungle rife with saw-toothed foliage and leeches, capped by a strenuous hike up the mountain. He left with the realization that the island has never recovered.

"The oral history holds that this was a thriving island when this cataclysm occurred," Wood said. Pottery, jewelry and housewares found by archaeologists confirm this pre-eruption prosperity, but now, residents lack good roads and clean water. In the year following his 2005 visit, Wood writes, at least 20 Sumbawan children died from malnutrition.

In presenting the story of this little-known volcano and its everlasting effects on the world, Wood isn't so much trying to bestow on Tambora its rightful place in infamy as he is using it to demonstrate what he describes as "the fragile interdependence of human and natural systems." In the epilogue, he suggests that the far-reaching effects of Tambora's temporary climate chaos should serve as a cautionary tale.

"It's like a perfect case study of the devastating impacts that even a short-term deterioration in climate can have," Wood said. "Now, we're entering a period of a kind of open-ended climate crisis. We can foresee increasing disruptions."

As the director of the U. of I.'s Sustainability Studies Initiative in the

Humanities, Wood teaches several English courses that now have an environmental bent: The Ecology of Poetry 101, Green Romanticism 431, New Directions in Eco-criticism 570. His lifelong passion for the poetry and music of the Romantic era has moved to the background.

"I can't work without listening to music," Wood said, "so I listen to a lot of Mozart. But in the time that I have left in my career, I need to devote myself to some small corner of the general sustainability enterprise."

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