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Feeling Hot Can Fuel Rage

Hotter weather sparks aggression and revolution

By Ajai Raj | Friday, January 24, 2014

As the climate heats up, tempers may follow suit, according to a study published in August 2013 in *Nature*. Analyzing 60 quantitative studies across fields as disparate as archaeology, criminology, economics, geography, history, political science and psychology, University of California researchers found that throughout history and across the world, higher temperatures, less rainfall and more drought were consistently linked to increased violence. The correlation held true for aggression between individuals, such as domestic abuse and assault, but was even more pronounced for conflict between groups [see *timeline*].

“We didn't expect for there to be nearly so many convergent findings among so many different researchers,” says economist Solomon Hsiang, now at U.C. Berkeley, who led the study. “We were actually really stunned by the level of consistency in the findings that were out there and by the size of the effects we were observing.” The researchers used statistical modeling to show that aggression scales with a combination of temperature, place and time—for example, if one U.S. county is three degrees Celsius warmer for three months or one African country is 0.6 degree C warmer for a year, statistics reveal an uptick in crime, violence and revolutionary fervor.

The reasons behind the climate-violence link are complex and not fully understood, although anyone who has lived through a heat wave can attest to one simple fact: “When people are hot, it makes them cranky,” says Brian Lickel, a social psychologist who is on the faculty of the Psychology of Peace and Violence program at the University of Massachusetts Amherst and who was not involved in the study. “It makes people more prone to anger, it makes people more frustrated, and it makes decision making more impulsive. And that can lead to altercations that escalate to more extreme levels of aggression.”

Discomfort aside, the physical temperature of the brain may also play a role, according to Glenn Geher, director of evolutionary studies at the State University of New York at New Paltz, who also was not involved in the study. “There really is something to the idea of being ‘hot-headed,’” he says. “Brain temperature, which is affected by ambient temperature, does seem to be associated with aggressive mood states and aggressive behavior.” The bellicosity relates to a lack of oxygen in the regions of the brain that control our impulses, as the body directs more blood to the skin's surface in an effort to cool off, Geher explains. “So you get more emotional reactions and less prefrontal, step-back, cognitive-processing kinds of actions.”

As for the protests, wars and revolutions supposedly fueled by sweat, the key factor



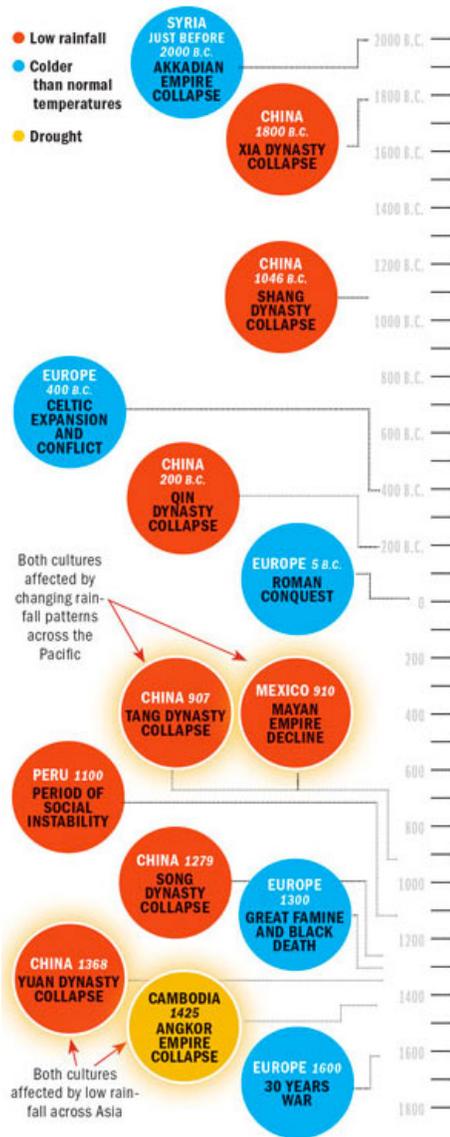
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may be survival, especially in drought-ridden areas. “When there are resource constraints—when there is lack of food, when there is lack of access to water, when there is economic destruction—then that is a potent predictor of conflict between groups,” Lickel adds. “When you’re in a society under stress and there is a danger of violence, people’s group identities become incredibly important, and violence begins to get organized around these group terms.”

Some critics have accused the study authors of scaremongering, playing up their dramatic results to take advantage of public concern about climate change. Yet decades of research support the link between hotter temperatures and increased violence, and this study—one of the largest analyses ever attempted—aligns well with an existing body of work. “I think the current study is impressive in how encompassing it is and how integrative it is,” Geher says. “If the data are right, there are some scary implications that I think people need to take into account.”



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