

Global Warming, the Politicization of Science, and Michael Crichton's *State of Fear*

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Abstract — Michael Crichton's book *State of Fear* addresses the politicization of science, in particular the topics of climate change and global warming, through the vehicle of a novel. In the author's opinion, Crichton is correct: the field of climate research has become highly politicized. An example is provided by the revisionist efforts of some researchers to extinguish the existence of a Medieval Warm Period. The politicization of science is a threat to the process of free inquiry necessary for human progress.

Keywords: global warming — temperature — Crichton-climate — Medieval Warm Period

On December 26, 2004, a magnitude 9.0 earthquake occurred off the coast of Northern Sumatra. The massive temblor, the largest in 40 years, spawned tsunamis that killed more than 280,000 people. The next day, a colleague at a think tank emailed me to ask whether I had any opinions about the new Michael Crichton book, *State of Fear* (Crichton, 2004).

Although *State of Fear* is a fictional thriller about eco-terrorism, its real thesis is the politicization of science, in particular climate change and global warming. Because global warming is a highly-charged political subject, Crichton's book has received a lot of attention in the press, including a review by *Washington Post* columnist George Will (Will, 2004).

My colleague closed his email with a little joke:

P.S.—I'm also anxious to see if anyone blames this weekend's tsunami in Indonesia on global warming.

We didn't have long to wait. A few hours later, the CBS evening news broadcast did just that. Citing unnamed "climate experts", they put up a graphic that had only the words "global warming" and "tsunamis". News anchor Dan Rather then stated:

Climate experts warned today that tsunamis could become more common around the world and more dangerous. They cite a number of factors, including a creeping rise in sea levels believed to come from global warming and growing populations along coastal areas.'

A Russian politician was less circumspect. The Deputy Chairman of the Russian Duma (parliament), Artur Chilingarov, told the Russian news agency Ria Novosti:

The reason for the earthquake and a gigantic tsunami which killed several tens of thousands of people in South and Southeast Asia was probably a global climate change . . . scientists have registered lately a change of the average temperature, which is now growing at fantastic rates. These seemingly insignificant temperature changes allow the atmosphere and oceans to accumulate additional energy . . . (Anonymous, 2004a).

I have had my own experiences with the politicization of climate science. In 1995, I had a short paper published in the prestigious journal *Science* (Deming, 1995). I reviewed how borehole temperature data recorded a warming of about one degree Celsius in North America over the last 100 to 150 years. I closed the manuscript with what seemed to me to be a remarkably innocuous and uncontroversial statement:

A cause and effect relationship between anthropogenic activities and climatic warming cannot be demonstrated unambiguously at the present time. (Deming, 1995: 1577)

The week the article appeared, I came into my office one morning to find a voicemail message from a reporter for National Public Radio. He wanted to interview me concerning my article in *Science*. Visions of glory danced in front of my eyes. I was going to be on national radio. Surely, it was only a matter of time before I would be a regular guest on the McNeil-Lehrer news hour on PBS.

Excited, I called the reporter back. But all of my fantasies were immediately dispelled. The reporter focused in on the last sentence in the *Science* paper. He asked me, did I really mean to say that? Did I really intend to imply that the warming in North America may have been due to natural variability? Without hesitation, I said "yes". He replied, "Well then, I guess we have no story. That's not what people are interested in. People are only interested if the warming is due to human activities. Goodbye." And he hung up on me. It was my first realization that the media intentionally filter the information the public receives.

A year later, I received a telephone call from an author working on an article for *International Wildlife*, a magazine published by the National Wildlife Federation, an environmental advocacy group. We discussed some of my work, and talked about the implication of borehole temperature measurements for global warming. Subsequently, the editor of *International Wildlife* sent me a draft article for review. I was horrified. My work and comments had been taken out of context and used in such a way as to exaggerate the magnitude of climate change. I made some pointed comments, and the article was toned down a little.

I later learned that the author of the *International Wildlife* article was not a scientist, but a lawyer. I had been naive. I had assumed that everyone was like me—they were interested in the truth. But a lawyer's job isn't to discover truth, it's to win an argument. Neither is an advocacy organization interested in truth—they are committed to advocating a certain position regardless of the facts.

With the publication of the article in *Science*, I gained significant credibility in the community of scientists working on climate change. They thought I was one of them, someone who would pervert science in the service of social and political causes. So one of them let his guard down. A major person working in

the area of climate change and global warming sent me an astonishing email that said "We have to get rid of the Medieval Warm Period."

The Medieval Warm Period (MWP) was a time of unusually warm weather that began around 1000 AD and persisted until a cold period known as the "Little Ice Age" took hold in the 14th and 15th centuries. Warmer climate brought a remarkable flowering of prosperity, knowledge, and art to Europe. As the temperature increased, so did agricultural yields. Marshes and swamps dried up, removing the breeding grounds of mosquitoes that spread malaria. Former wetlands were converted to productive farmland. Infant mortality fell, and the population grew. From 1100 to 1300 AD, the population of Europe increased from about 40 to 60 million (Moore, 1995).

The surest sign of the warming climate in Europe was the settlement of Greenland by Vikings from Iceland. The Greenland settlements reached a height of prosperity in the 12th and 13th centuries when 3,000 colonists occupied 280 farms.² The settlements came under duress in the late 14th century due to the onset of Little Ice Age cooling; they finally perished in the 15th century.

The existence of the MWP was recognized in the climate textbooks for decades. But now it was a major embarrassment to those maintaining that the 20th century warming was truly anomalous. It had to be "gotten rid of".

During the early 1990s, an important reference book for those working in the area of climate change was *Climate Change: the IPCC Scientific Assessment* (Houghton et al., 1990). The IPCC, the *Intergovernmental Panel on Climate Change*, was the major international organization concerned with the dangers of global warming. And yet a skeptic could open the IPCC's own reference text and see that 20th century warming was dwarfed by the MWP (Houghton et al., 1990: 202). When the 20th century warming was placed into the context of a thousand years of history, it appeared to be virtually insignificant. If people were going to be convinced of the danger of global warming, the MWP clearly needed to be erased from history.

In 1998, Michael Mann, a climate researcher at the University of Massachusetts, published a paper in *Nature* where he and his colleagues claimed that temperatures in the late 20th century were warmer than any time since the year 1400. A year later, the same authors extended their analysis back to the year 1000 (Mann et al., 1999). In the Mann et al. (1999) reconstruction of temperature, the MWP simply vanished.

The analyses by Mann et al. (1998, 1999) resulted in graphs of mean global temperature over the last 1000 years that had the shapes of hockey sticks. The graphs showed that mean global temperatures were uniformly monotonic over the last millennium, abruptly rising in the 20th century.

Mann et al. (1999: 759) concluded that "the latter 20th century is anomalous in the context of at least the past millennium". This conclusion was greeted like the triumphal return of Jesus Christ. Decades of work was overturned by one journal article. The MWP had been reinterpreted out of existence.

Within a few days, the research by Mann and his colleagues passed from analysis to fact. On March 3, 1999, the University of Massachusetts issued a press release with the headline "1998 Was Warmest Year of Millennium . . ." On March 22, 1999, the Atlanta Journal-Constitution published an editorial titled "The Facts about Global Warming" wherein they stated:

The 10 warmest years on record have occurred in the past 15 years. . . Clearly something is happening to Earth's climate, and according to the scientific consensus, that "something" probably has two arms, two legs and two or three cars in every garage. (Anonymous, 1999)

Four years later, Willie Soon & Sallie Baliunas (2003) reviewed more than 200 previous studies and concluded that the evidence for the existence and global extent of both the Medieval Warm Period and the Little Ice Age was well established. It was hardly a controversial result, yet the Soon & Baliunas (2003) paper was greeted by a firestorm of controversy. Three editors of the academic journal in which the study had been published resigned in protest (Regalado, 2003).

Writing in the June 24, 2003, internet version of Scientific American, reporter David Appell explained Soon & Baliunas' sin.

. . . the consensus view among paleoclimatologists is that the Medieval Warming Period was a regional phenomenon, that the worldwide nature of the Little Ice Age is open to question and that the late 20th century saw the most extreme global average temperatures.³

Soon & Baliunas had committed the cardinal sin of violating the new consensus. They were not the first scientists to get in trouble for violating consensus. In the 17th century, an irascible Italian mathematician made people even angrier. When asked if he didn't have to honor his enemies objections, he explained:

The conclusions of Natural Science are true and necessary, and the judgment of men has nothing to do with them. (Galilei, 1953: 63)

When he was in a less temperate mood (his normal state), Galileo made a more pointed criticism of human consensus.

The crowd of fools who know nothing is infinite. (Drake, 1957: 239)

A direct attack on Mann et al. (1999) appeared later in 2003. Two Canadian scientists, Stephen McIntyre and Ross McKittrick, tried to replicate the results of Mann et al. (1998), but were unable to do so. In a paper published in *Energy & Environment*, they claimed:

The data set of [Mann et al., 1998] . . . contains collation errors, unjustifiable truncation or extrapolation of source data obsolete data, geographical location errors, incorrect calculation of principal components, and other quality control defects. (McIntyre & McKittrick, 2003: 751)

McIntyre and McKittrick also found that Mann et al.'s (1998) results could not be supported by the data.

The particular "hockey stick" shape derived in the [Mann et al., 1998] proxy reconstruction . . . is primarily an artifact of poor data handling, obsolete data and incorrect calculation of principal components. (McIntyre & McKittrick, 2003: 751)

An even more serious critique of the Mann et al. (1998, 1999) climate reconstructions appeared in *Science* in October, 2004. Von Storch et al. (2004)

pointed out that the methodology used by Mann et al. (1998, 1999) was flawed. Their reconstruction technique tended to dampen out, and thus obliterate, past temperature changes. Although the analysis by von Storch et al. (2004) published in *Science* was damning, the language was diplomatic.

The centennial variability of the Northern Hemisphere temperature is underestimated by the regression-based methods applied here, suggesting that past variations may have been at least a factor of 2 larger than indicated by empirical reconstructions. (von Storch et al., 2004: 679)

In an interview, the lead author, Hans von Storch, was less tactful. In the October 4, 2004, issue of the German magazine *Der Spiegel*, he referred to the "hockey stick" graphs of Mann et al. (1998, 1999) as *quatsch*. The German word *quatsch* translates into English as rubbish, hogwash, balderdash, bilge, bunk, hooey, malarkey, or nonsense (Anonymous, 2004b).

As the year 2005 began, the Mann et al. affair began to take on an eerie resemblance to the case of Emory University professor Michael Bellesiles. Bellesiles was the author of an award-winning book, *Arming America: The Origins of a National Gun Culture* (2000). The revolutionary thesis of *Arming America* was that guns had been uncommon in colonial America. The book won Columbia University's prestigious Bancroft Prize for an original contribution to American history. Bellesiles' findings were immediately trumpeted as a revelation with profound implications for the political debate about gun rights in the United States. Writing in the *Chicago Sun-Times*, Northwestern University history professor Gary Wills claimed:

There is nothing left to vindicate the myth that individually owned guns were a source of American freedom and greatness. (Wills, 1999: 31)

Critics of Bellesiles' thesis seemed to be confined to a community of ignorant zealots and gun fanatics who circulated *ad hominem* attacks on the internet. Writing in the *Atlanta Journal-Constitution* on March 18, 2001, Bellesiles claimed that he had become the victim of a hate campaign waged over the World Wide Web (Bellesiles, 2001).

The first intimation in the mainstream press that there might be anything wrong with Bellesiles' scholarship occurred on October 3, 2001. The *Boston Globe* reported that Emory University had asked Bellesiles to write a detailed defense of his work. Among the charges against Bellesiles was that he claimed to have relied upon San Francisco probate records that had been destroyed in the 1906 fire (Mehegan, 2001).

A year later, it was all over. An investigative panel assembled by Emory concluded that Bellesiles "was guilty of both substandard research methodology and of willfully misrepresenting specific evidence" (de la Merced, 2002). Bellesiles resigned, but without admitting any culpability. In an effort to save face by rewriting history, Columbia University retroactively rescinded Bellesiles' Bancroft Prize (Anonymous, 2002).

Personally, I had doubts about the Mann et al. (1999) claims from the beginning. Only a few years earlier, the existence of a world-wide MWP had been documented by the most important paleoclimate study ever published, Huang & Pollack's (1997) analysis of borehole temperature data.

As Lachenbruch & Marshall (1986: 696) pointed out many years ago, borehole temperatures are the most robust paleoclimate indicator we have because they are not a proxy, but a direct thermophysical record of temperature changes occurring at the surface.⁴

The Huang & Pollack (1997) study was originally submitted to *Nature*. I was one of the reviewers of the manuscript. I told the *Nature* editors that the article would surely be one of the most important papers they published that year. But it never appeared in print. *Nature* asked the authors to revise the paper twice and then, after a long delay, ended up rejecting it. While writing this essay, I learned that McIntyre and McKittrick's manuscript had received similar treatment at *Nature*. Apparently, it is not enough for the editors at *Nature* to simply reject an article that is politically incorrect, they have to delay its inevitable publication in another journal by tying it up in the review process for several months.

Not only does the analysis by Huang & Pollack (1997) show a well-developed MWP, it also reveals that mean surface global temperature over most of the last 10,000 years was significantly warmer than the late 20th century value. But this paper received virtually no attention in the press. After all, it wasn't "what people are interested in."

Two years ago, Michael Crichton delivered a lecture at Caltech titled *Aliens Cause Global Warming*. The talk was transcribed onto Crichton's website,⁵ and subsequently has been widely circulated on the internet.

Aliens Cause Global Warming is about the politicization of American science over the last 40 years, starting with the search for extraterrestrial life, and ending with global warming.

How many people remember the peril of nuclear winter? Crichton shows how the entire concept was "from the outset the subject of a well-orchestrated media campaign" conducted for political ends. A Washington, DC, public-relations firm was paid \$80,000 to publicize the research. The first appearance of the work in the peer-reviewed, scientific literature, was in the December 23, 1983, issue of *Science* (Turco et al., 1983). But the dangers of nuclear winter had been heralded nearly 2 months earlier by Carl Sagan in the October 30, 1983, issue of *Parade* magazine, a supplement to Sunday newspapers (Seitz, 1986). By 1986, it was apparent that the conclusions of Turco et al. (1983) were suspect, and that the entire field of research was highly politicized. Writing in the January 23, 1986, issue of *Nature*, K. A. Emanuel (1986: 259) noted that "nuclear winter research . . . has become notorious for its lack of scientific integrity".

In *State of Fear*, Michael Crichton takes the thesis he first espoused in *Aliens Cause Global Warming* and expands it through the vehicle of a fictional thriller. Fiction can be used very effectively to promulgate social and political causes.

Classic examples include Harriet Beecher Stowe's *Uncle Tom's Cabin* (1852) and Ayn Rand's *Atlas Shrugged* (1957).

State of Fear follows the adventures of lawyer Peter Evans as he is dragged into a conflict between eco-terrorists and counter-terrorism agents. The goal of the terrorists is to use advanced technology to induce natural disasters that can be blamed on global warming. The chief villains are the administrators of the fictional *National Environmental Resource Fund*, cynical men whose only goal is to manipulate the press so as to increase the funding for their organization. No one is surprised that it all comes down to money.

The novel reads like the screenplay for a Hollywood thriller. Attorney Evans narrowly escapes freezing to death after falling into an ice crevasse in Antarctica. Assassinations are not done with routine methods such as guns or garrotes. People are killed by injecting them with the venom of a poisonous octopus. In one memorable scene, an attractive young woman can only escape electrocution by stripping off her clothes. An essential component of the James Bond genre is high technology. In *State of Fear*, the reader is introduced to hypersonic cavitation technology and weather modification by changing "the electric potentials of the infra-cumulus strata" (Crichton, 2004: 313).

Crichton skillfully and seamlessly intertwines the plot with information on global warming. In one chapter, attorney Peter Evans is forced to examine the evidence for global warming in the context of a hypothetical lawsuit. All uncertainties, failed predictions, and questions concerning the reliability of the data are brought into focus.

A unique aspect of *State of Fear* is Crichton's repeated citation of the scientific literature that contradicts the "consensus" on the dangers of global warming. Among the claims found in *State of Fear*:

- carbon dioxide stimulates plant growth (p. 421)
- since 1980, the Sahara Desert has been **shrinking**, not expanding (p. 421)
- the rate of emergence of new diseases has not changed since 1960 (p. 421)
- there are no accurate estimates for the rate of species extinction (p. 422)
- extreme weather, including hurricanes, has not become more frequent (p. 426)
- a renewable-energy technology that can replace the use of fossil fuels does not exist (p. 479)
- Antarctica is getting colder, and the thickness of the ice is increasing (p. 193)
- the urban heat-island effect on the temperature record has been underestimated (p. 384)

Perhaps the most interesting character in *State of Fear* is professor Norman Hoffman. Professor Hoffman studies what he calls the "ecology of thought." In a memorable soliloquy, Hoffman muses how the most prosperous and safe civilization in human history has become obsessed with doomsday visions and exists in a "state of fear."

Has it ever occurred to you how astonishing the culture of Western society really is? Industrialized nations provide their citizens with unprecedented safety, health, and comfort. Average life spans increased fifty percent in the last century. Yet modern people live in abject fear. They are afraid of strangers, disease, of crime, of the environment. They are afraid of the homes they live in, the food they eat, the technology that surrounds them. They are in a particular panic over things they can't even see—germs, chemicals, additives, pollutants. They are timid, nervous, fretful, and depressed. And even more amazingly, they are convinced that the environment of the entire planet is being destroyed around them. Remarkable! Like the belief in witchcraft, it's an extraordinary delusion—a global fantasy worthy of the Middle Ages. Everything is going to hell, and we must all live in fear. Amazing. (Crichton, **2004: 455**)

Foremost among the institutions that promote the state of fear are American universities.

The modern State of Fear could never exist without universities feeding it. There is a peculiar neo-Stalinist mode of thought that is required to support all this, and it can only thrive in a restrictive setting, behind closed doors, without due process. In our society, only universities have created that—so far. The notion that these institutions are liberal is a cruel joke. They are fascist to the core... (Crichton, **2004: 459**)

As the 21st century dawns in America, our institutions of higher education appear to be reverting to their Medieval ancestors. Intolerant and dogmatic, European universities in the 15th and 16th centuries were dedicated to maintaining the intellectual consensus. After attending most of the European colleges of his day, Paracelsus (1493–1541) characterized his university education by stating:

I was brought up in the garden where the trees are mutilated. (Baas, 1889: **377**)

And what does Crichton himself think? In an appendix titled "Author's Message", he lays out his own views in a series of short statements that make it clear he identifies primarily with the Cornucopian School.

I think for anyone to believe in impending resource scarcity, after two hundred years of such false alarms, is kind of weird. I don't know whether such a belief today is best ascribed to ignorance of history, sclerotic dogmatism, unhealthy love of Malthus, or simply pigheadedness, but it is evidently a hardy perennial in human calculation. (Crichton, **2004: 570**)

Michael Crichton's *State of Fear* is an exciting and well-written fictional thriller. But the book is really about how we do science. For ages, science in Western Civilization has struggled to free itself from restrictions imposed by theology (White, 1903). That battle seems to have been pretty well won. But the fight for freedom of thought seems to be never-ending. The new threat comes from the politicization of science.

Crichton closes *State of Fear* with a quote from Alston Chase about the dangers of politicizing science (Crichton, 2004: 580). But I have a better quote from Phillip Johnson:

Whenever science is enlisted in some other cause—religious, political, or racialistic—the result is always that the scientists themselves become fanatics. (Johnson, **1991: 154**)

Notes

- ¹ CBS Evening News, December 27, 2004.
- ² Encyclopedia Britannica, 1972, "Greenland", Vol. 10, p. 898.
- ³ <http://www.sciam.com/article.cfm?articleID=000829C7-70D9-1EF7-A6B8809EC588EEDF>
- ⁴ Michael Mann and his coworkers have tried to explain the differences between their results and analysis of borehole temperatures by claiming that changes ground surface temperatures do not necessarily track changes in air temperature (Mann, M. E., and Schmidt, G., 2002, *Geophysical Research Letters*, 30, 1607). But their claims were met with robust criticisms by Chapman et al. (2004, *Geophysical Research Letters*, 31, doi: 10.1029/2003GL019054).
- ⁵ http://www.crichton-official.com/speeches/speeches_quote04.html.

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