

SKEPTIC TANKS

HOW GLOBAL WARMING DENIERS DUPE AMERICA

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Prologue

Practicing scientists, scientific academies and societies, the peer-reviewed literature of science, and governments are virtually unanimous: global warming is real, caused by humans, and dangerous. The head of the National Oceanographic and Atmospheric Administration said, "There's a better scientific consensus on this than on any issue I know—except maybe Newton's second law of dynamics."¹

Yet there is another group, the global warming deniers, who claim there is no consensus, that global warming is a hoax. They pass through a succession of claims, falling back to the next as scientists refute each one, like an army in skillful retreat.

"The earth is not warming," they say.

"All right, it is warming, but it's the Sun."

"When then, humans are the cause, but it doesn't matter, because warming will do no harm. More carbon dioxide will actually be beneficial."

"Admittedly, global warming will be harmful, but there's nothing we can do about it."

"Sure, we could do something about it, but the cost would be too great. We have more pressing problems here and now, like AIDS and poverty."

"We might be able to afford to address global warming someday, but we need to wait for sound science and until we develop new technologies that can replace fossil fuel energy sources."

And to come full circle, "The earth is not warming. Global warming ended in 1998; it was never a crisis."

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Most scientific theories are of interest mainly to scientists, conveying no immediate threat or advantage to human society. Not so global warming. If the scientists' worst-case scenario comes true, our world will become unrecognizable. The long, generally upward path of human progress will halt and descend, returning some parts of the world to the Stone Age. No corner of the planet will escape.

In 2006, the Stern Report of the British Government, overseen and named for Sir Nicholas Stern, former Economist and Senior Vice-President of the World Bank, concluded, "Our actions over the coming few decades could create risks of major disruption to economic and social activity, later in this century and in the next, on a scale similar to those associated with the great wars and the economic depression of the first half of the 20th century. And it will be difficult or impossible to reverse these changes."²

But in the three years since the report appeared, the threat has grown more dire. Under business-as-usual carbon emissions, scientists now project that global temperatures will rise by 9-12.6°F (5-7°C) by 2100 and that sea level could climb as much as 6 feet (2 m). Such changes would not merely cause "disruptions" like those induced by wars and economic depressions. Rather they would threaten to destroy the world as we know it, as though every great disaster of human history—every drought, hurricane, storm surge, crop failure, famine, pandemic, heat wave, economic depression, and war—were to happen at once. Moreover, unless within the next few years we begin to reduce emissions, the long lag time of carbon dioxide in the atmosphere and oceans will ensure that a new dark age lasts for a millennium—or more.

If the world experiences anything close to worst-case global warming, these are a few of the effects. Rising seas drown low-lying oceanic islands like Kiribati and Tuvalu and remove them

from the map. A three-foot increase inundates the seaward edge of every coastal city, providing a higher platform for the more frequent and larger storms that accompany global warming. Loss of confidence in the future of coastal cities causes insurers and lenders to withdraw, depopulating of some of the world's largest and most important cities.

With the North Sea surging in on three-foot higher seas, Holland, one third of it below sea level in 2000, ceases to exist as a nation. One-third of Bangladesh is underwater, sending 100 million climate refugees on the move. Around the world, a billion displaced persons from poorer, hotter regions like Bangladesh, Mexico, and North Africa seek refuge. Richer countries learn that no border fence or guards can stop people whose children are dying of hunger and thirst.

A 10°F (5.5°C) temperature rise melts most of the world glaciers, depriving billions of water. The great melting decimates supplies along the Andean Coastal strip, in the Punjab and Bangladesh, and in many European countries. Nearly half the world's population depended on rivers rising from glaciers that feed the great Himalayan rivers: the Brahmaputra, Ganga, Indus, Mekong, Salween, Yangtze, and Yellow. Now each of those great rivers runs dry for part of the year.

Almost all of Pakistan's water came from melting glaciers in disputed Kashmir. Rather than let its people die of thirst, Pakistan demands that India give up the water it is taking from the Punjab and threatens to use its nuclear weapons. Iran commands Israel to provide more water to the Palestinians and backs it up with underground nuclear tests. Ethiopia and the other upriver countries on the Nile insist that Sudan and Egypt allow them to retain more of the great river's water. Water is life and people and nations will do what they must to get it, including going to war and including using nuclear weapons.

Regions that are already hot and dry, like the Punjab and the African Sahel, grow hotter and drier. Phoenix, Arizona is as hot as Death Valley is today and runs low on water, starting a Grapes of Wrath exodus in reverse. Around the world, reservoirs lose water and gain silt, steadily reducing their ability to supply water and power.

Fire is the handmaiden of drought and both afflict Australia, the driest continent, forcing Australians to abandon large sections of their country. In western North America, bark beetles kill hundreds of thousands of trees, and most of the national forest burns. Smoke clogs the western skies. In the Amazon, slash-and-burn agriculture and fires strengthened by global warming destroy the rain forest.

As temperatures rise and rain patterns change, crop belts shift, in some cases from one country into another. The great Punjab wheat belt, without enough water from the melted Himalayan glaciers, withers and famine spreads. The American grain belt migrates north into Canada. The wine industries of Australia, California, and Europe shrink or vanish. People find they can live without wine, but not without rice and wheat.

Biologists estimated that global warming would drive one-third of species to extinction and they were right, as tens of thousands disappear. The sedentary birds, 80 percent of all species, are especially vulnerable. Not a Silent Spring, but a Silent Year, descends on much of the planet.

The lesson bears repeating: global warming is the greatest danger that our planet and its species have ever faced.

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Given the size of the threat and the virtual unanimity of opinion among practicing scientists, one would expect that the

public would accept scientific opinion and demand action to reduce carbon emissions. After all, people admire scientists and usually accept their findings. According to a 2003 Harris poll, the public ranked scientists as having more "prestige" than any other profession, followed by doctors, teachers, nurses, and military officers respectively.³ A 2009 poll by Pew Research that asked which professionals had contributed most to society's well-being ranked scientists third, after the military and teachers.⁴ Almost every advance in the quality of human life has come from science and its partners, engineering and medicine. Yet paradoxically, as concern among scientists over global warming has risen, concern among the public has fallen.

A March 2009 Gallup poll found that 66 percent of Republicans believe that scientists exaggerate global warming, having nearly doubled in the last decade.⁵ Over the same period, the opinion of Democrats failed to budge. In another section of the poll, Gallup found that fewer than 40 percent of U.S. adults believe that global warming poses a "serious threat" to themselves or their way of life. Among eight environmental problems—water and air pollution, loss of rain forest, species extinction, and the like—global warming ranked last in the percentage of respondents who were worried "a great deal or a fair amount" about the problem. The percentage that listed global warming as an important concern fell more between March 2008 and March 2009 than did opinion about any other category.

A Pew Research Center poll in January 2009 found the same result: global warming stood last among 20 voter concerns. The economy and jobs topped the list, far outranking global warming. In 2008, 35 percent of those questioned agreed that global warming was "a top priority"; a year later, the percentage had fallen to 30 percent.

On October 22, 2009, Pew reported the results of its latest poll. In answer to the question of whether there is solid evidence that the earth is warming, in 2006 71 percent had said yes and 17 percent had said no, with the rest undecided. By the fall of 2009, the number answering yes had fallen to 57 percent and the number answering no had risen to 33 percent. Thus barely more than half the public agree with the overwhelming scientific consensus on global warming. Moreover, as scientific certainty has increased, public acceptance has fallen.

How can we explain the disconnect between increasing scientific certainty and decreasing public concern? A clue comes from evolution, the other scientific topic on which many American adults disagree with scientists. Another Harris poll found that the percentage of Americans who do not believe that humans evolved from earlier species had risen from 46 percent in 1994 to 54 percent in 2005. One section of that poll reveals the reason: almost two-thirds of American adults believe that "human beings were created directly by God." With few exceptions, those who deny evolution evidently do so because they believe in the Biblical account of creation, ranking the authority of the Bible higher than that of scientists and being unable or unwilling to reconcile the two.

The public gets its information about global warming not from the Bible or religion, nor from scientific journals, but from the media and the media do a dreadful job, having, as one author put it, "missed the story of the century."⁶ But the media do not deserve all, or even most, of the blame, for behind our newspapers, magazines, television, and radio reporting lies a well-funded industry of denial devoted to repudiating the theory of global warming and delaying action to prevent it. The denial machine employs some of the same people and uses some of the same propaganda techniques used to deny that tobacco smoke is a

health hazard, that chlorofluorocarbons (CFCs) deplete the ozone layer, that coal-fired plants cause acid rain, and so on. Denial has become a growth industry.

A coalition of "think tanks," called skeptic tanks in this book; Big Oil and Big Coal; free-market zealots; incorrigible right-wing pundits like George Will and Rush Limbaugh; masters of deception like authors Bjorn Lomborg and the late Michael Crichton; and an army of climate lobbyists (2,340 in 2008, 90 percent of them advocating against action to limit carbon emissions) has mounted a massive and well-funded propaganda effort to deceive the public into thinking that global warming is a hoax, or, if not, so uncertain that it makes sense to wait for more evidence. How many readers have heard of the Heartland Institute? What about the Center for the Study of Carbon Dioxide and Global Change, the Competitive Enterprise Institute, the Cooler Heads Coalition, the George C. Marshall Institute, the Global Climate Coalition, and the dozens of other skeptic tanks? How many are aware that deniers from former President George W. Bush on down have followed a set of cynical disinformation guidelines laid down by Republican Consultant Frank Luntz in a 2002 memo, guidelines modeled after the strategies of the tobacco companies, this time designed to sow doubt and delay action over global warming?

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Chapter 1 sets the stage by contrasting two outwardly similar meetings of "elite scientists." Confusingly, the two groups come to exactly opposite conclusions about global warming. One says it is real and dangerous; the other that global warming was over before it began and was never a crisis. To demonstrate the scientific consensus and how it evolved, in Chapters 2 and 3 I follow the greenhouse theory from its beginnings in the

nineteenth century through to the conclusion of the Intergovernmental Panel on Climate Change in 2007 that global warming is "unequivocal," that human emissions of carbon dioxide are the cause, and that the warming endangers humanity. The global warming deniers dispute all three claims and also argue that there is no scientific consensus. Chapter 4 presents the evidence for consensus; Chapter 5 shows how deniers attempt to debunk that evidence. I argue that the evidence for global warming is so strong that we can consider "case closed"; Chapter 6 briefly summarizes the critical evidence.

Who are the deniers? I divide them into two categories: those with scientific training and credentials (Chapter 7) and those without them(Chapter 8), the latter group including pundits, fiction writers, and self-appointed climate experts.

The deniers' message is organized and promulgated through a set of organizations I call "skeptic tanks." These have unobjectionable, even lofty-sounding names, but when you read the fine print of their mission statements, you find them dedicated to denying global warming and delaying action to prevent it. Chapter 9 profiles some of the most prominent.

The skeptic tanks are the factories of denial. To maintain them and get out their message of deceit costs money, of which the skeptic tanks have little. Never mind: as reported in Chapter 10, ExxonMobil and a few right-wing foundations have kept the skeptic tanks in business for two decades. The deniers and skeptic tanks could not have succeeded without the complicity of the media, who have covered global warming as though the deniers have as much credibility as mainstream scientists, even the entire global science community. In Chapter 11 I explain how the attempt by the media to provide balanced coverage of global warming has actually wound up producing a biased account that has badly misled the public.

To try to show that global warming is false, the deniers repeat the same arguments over and over. Chapter 12 examines and rebuts the most common denier arguments, which sound plausible at first but fall apart on closer examination. Former Vice President Al Gore has become the villain of choice for the global warming deniers. Chapter 13 recounts what happened when their fondest dream came true: when they got Gore and his Oscar-winning film, An Inconvenient Truth, into a court of law.

When the deniers run out of scientific arguments, they revert to claiming that global warming is a hoax, the greatest perpetrated in human history. Chapter 14 asks what it would take for global warming to be a hoax, a conspiracy of left-leading scientists and politicians. Chapter 15, the final chapter, reviews what we have learned about the deniers and their tactics.

Sidebar

Not Skeptics, Deniers

Scientists are supposed to reserve judgment until they fully corroborate new claims. Extraordinary claims, as Carl Sagan said, require extraordinary evidence. Sir Francis Bacon noted, "If a man will begin with certainties, he shall end in doubts; but if he will be content to begin with doubts, he shall end in certainties"⁷. T. H. Huxley put it this way: "The improver of natural knowledge absolutely refuses to acknowledge authority, as such. For him, skepticism is the highest of duties, blind faith the one unpardonable sin."⁸ Bertrand Russell summed up: "[I]t is not what the man of science believes that distinguishes him, but how and why he believes it. His beliefs are tentative, not dogmatic; they are based on evidence, not on authority or intuition."⁹

Why then should we not give the title of skeptic to those who refuse to accept the scientific consensus on global warming? Because when the evidence becomes strong enough, the honest skeptic has the obligation to accept it. But as the evidence for global warming has mounted relentlessly over the last twenty years, one group has not only refused to accept that evidence, it has become ever more shrill in denial, attacking individual scientists and even science itself. The global warming deniers do not merely question the evidence and ask for more and better research, much less present any of their own. Rather they denounce climate science and those who practice it, ridiculing them and questioning their ethics and honesty. They do not write articles in scientific journals, they issue press releases and "declarations." To call such people skeptics is to sully a term of honor, allowing the deniers to cloak themselves in the mantle of science even as they denigrate science. Like those who deny

the Holocaust and that men walked on the Moon, those who abjure global warming are not skeptics; they are deniers. To call them skeptics would be to debase language as much as to call the Ku Klux Klan "bigoted" or Holocaust deniers "anti-Semitic."

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Note to readers: The Intergovernmental Panel on Climate Change reported in 2007 that global warming is "unequivocal" and that it is "very likely," defined as greater than 90 percent probable, that humans are the cause. In this book, instead of speaking of "anthropogenic global warming," or "human-caused global warming," I will simply say "global warming."

Chapter 1. Tale of Two Conferences

In December 2008 and in March 2009, two organizations claiming to be devoted to science and the scientific method each sponsored a conference. The two were outwardly identical, as speakers at each conference made presentations, illustrated their remarks with charts and tables, and took questions and comments from their audience. But the resemblance was only skin-deep, for the two sets of speakers came to opposite conclusions. Those at the December meeting of the American Geophysical Union (AGU), held in San Francisco's Moscone Center, treated global warming as an observational fact. Speakers at the March 2009 conference of the Heartland Institute, held in New York, scorned global warming as not only false, but a hoax designed, as one put it, to effect "an enormous transfer of wealth from the people to the government."¹⁰ The title of the New York conference presaged its conclusions: "Global Warming: Was it Ever a Crisis?"

Dr. James Hansen of the NASA's Goddard Institute for Space Studies gave an invited lecture at the AGU meeting titled, "Climate Threat to the Planet: Implications for Energy Policy and Intergenerational Justice." Sixteen thousand AGU members had come to the bay city for the meeting and Hansen's audience filled the conference room. He had become the most authoritative and the most outspoken scientist on global warming, warning with increasing urgency that rising temperatures threatened the future of humanity. Twenty years earlier, Hansen had been one of the first to sound the alarm, testifying on a sweltering June day to members of the Senate Energy and Natural Resources Committee that he was 99 percent certain that global warming had begun. "It is time to stop waffling so much and say that the

evidence is pretty strong that the greenhouse effect is here," Hansen cautioned.¹¹ Now, two decades later, for Hansen and his colleagues, the evidence for global warming had grown from "pretty strong" to virtually certain.

Hansen's science and his forthrightness had earned him the respect of his peers, winning him election to the National Academy of Sciences, the AGU Award for "Scientific Freedom and Responsibility," as well as medals from The World Wildlife Fund and the American Meteorological Association, the latter for "outstanding contributions to climate modeling, understanding climate change forcings and sensitivity, and for clear communication of climate science in the public arena." EarthSky Communications and a panel of 600 scientist-advisors named Hansen "Scientist Communicator of the Year," praising him as an "outspoken authority on climate change" who had "best communicated with the public about vital science issues or concepts during 2008."¹² But the more awards Hansen accumulated and the more his climate forecasts turned out to be right, the more the deniers vilified him. They had no choice, for if Hansen is right, the deniers are wrong. One can even go to Facebook.com and sign a petition requesting that NASA fire Hansen.

The NASA scientist presented a series of slides that summarized the state of climate science at the end of 2008. Some were from his own research, but most were the work of other scientists. The overall impression was of global warming advancing more rapidly than scientists had suspected only a few years earlier. Hansen did show one slide that was unusual for a talk at an AGU meeting: a photograph of his newest grandchild, Jake, whom he said "will live in the greenhouse world that we choose to create."¹³

Another speaker at the 2008 AGU meeting, Wallace Broecker of Columbia University, was also a pioneer in climate science. In

1975, Broecker published a paper in Science Magazine titled, "Climatic Change: Are We on the Brink of a Pronounced Global Warming?"¹⁴ Broecker had made many pioneering discoveries, becoming best known for his idea that ocean currents not only operate on the surface, but at depth as a kind of conveyor belt that transports salty, dense seawater around the globe.¹⁵ Winds push surface currents like the Gulf Stream from the equator toward the poles, where they cool and sink, the deep water flowing in the opposite direction to well up thousands of miles away in a different ocean. The oceanic conveyor helps control global climate, leading Broecker to fear that as the planet warms, melting freshwater ice might dilute the salty current and shut down the conveyor. That might switch off the Gulf Stream, changing the climate of the North Atlantic dramatically and unpredictably.

But in his AGU talk, titled "Shifting Rainfall: A Paleo Perspective," Broecker exemplified science at its best: he rejected his own theory: "Twenty years ago my concern regarding the impacts of the ongoing CO2 buildup were centered on the ocean's conveyor circulation. Would the predicted increase in rainfall and runoff lead to a sudden shutdown? In the meantime, model simulations have made clear that this is highly unlikely."¹⁶

In the AGU conference session titled Global Environmental Change, scientists presented more than 100 papers describing new research results. Not one of them contradicted the greenhouse theory of global warming. They evidently regarded the evidence for global warming as so strong that it constituted an observational fact. The speakers did not acknowledge the existence of the deniers or make personal attacks on them. To say the AGU scientists shared a consensus on global warming would be an understatement.

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In March 2009, 800 "scientists, economists, legislators, policy activists, and media representatives" gathered in New York for the three-day conference sponsored by the Heartland Institute.¹⁷ According to the Institute, "The presenters at this year's conference are the elite in the world among climate scientists." If that were true, then many of the speakers would have done climate research and published the results in scientific journals, but almost none had. Many of the presenters did not even have degrees in science. Still, they included the last man to set foot on the Moon (a PhD scientist), the President of the Czech Republic and the European Union, and a distinguished MIT meteorologist.

Not only did the conclusions of the speakers at the two conferences differ, so did their methods. Having few if any research results of their own to report, presenters at the Heartland Conference tended to spend their time attacking the research findings of mainstream scientists, looking for any discrepancy or inconsistency. The speakers said that global warming is natural, not man-made; that atmospheric carbon dioxide does not cause global warming; that global warming will not harm humans or coral reefs or lead to extreme weather events. Computerized climate models do not work, they claimed, and the alleged scientific consensus on global warming is nothing more than a "urban myth." And that is the list from only the first morning of the conference. After the meeting, the Heartland Institute answered its own question of whether global warming had ever been a crisis with "a resounding 'no.'"¹⁸

One of the keynote speakers at the Heartland Conference, Richard Lindzen, the Alfred P. Sloan Professor of Meteorology at MIT, has outstanding scientific credentials, though most of his

research has not dealt directly with global warming. Lindzen titled his talk: "Climate Alarm: What We Are Up Against, and What to Do." He opened with these words: "Global warming alarm has always been a political movement," thus denouncing those who disagree with him as motivated by politics, not science, a necessary denier theme.

Speakers at the Heartland Institute conference spent much of their time in personal attacks, especially on Hansen and former Vice President Al Gore, whose book and film, An Inconvenient Truth, had made him the most visible spokesperson for the scientists' point of view. One might have hoped that Lindzen, a distinguished professor, member of the National Academy of Sciences, and AGU medal winner himself, would have risen with dignity above petty personal attacks, but no, he got down in the mud, accusing scientists who espoused global warming—even his own MIT colleagues—of dishonesty and worse: of selling out their scientific integrity for money. Lindzen named names:

Most of the atmospheric scientists who I respect do endorse global warming [but] the science that they do that I respect is not about global warming. Endorsing global warming just makes their lives easier. My colleague, Kerry Emanuel, received relatively little recognition until he suggested that hurricanes might become stronger in a warmer world. He then was inundated with professional recognition. Another colleague, Carl Wunsch...[has] politics [that] are clearly liberal. Wally Broecker['s] work clearly shows that sudden climate change occurs without anthropogenic influence. However, he staunchly beats the drums for alarm and is richly rewarded for doing so.¹⁹

Lindzen neither presented research results of his own nor did he explain why for twenty years he has been so certain that global warming is false.

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Another major difference between the conferences of scientists and those of deniers lies in the aftermath. When their meetings end, scientists rush back into their labs to continue their

research and to follow leads picked up at the meeting. Deniers conduct a public relations stunt by issuing a "declaration," a cleverly worded statement that dresses up their denial in fancy duds. To paraphrase my friend Kris Krishtalka, a denier declaration is just anti-science in a cheap tuxedo.

After a 1992 meeting just prior to the Rio Earth Summit, deniers put out the Heidelberg Appeal, saying, "We are...worried...at the emergence of an irrational ideology which is opposed to scientific and industrial progress and impedes economic and social development..." Three years later came the Leipzig Declaration, which proclaimed, "There does not exist today a general scientific consensus about the importance of greenhouse warming from rising levels of carbon dioxide. On the contrary, most scientists now accept the fact that actual observations from earth satellites show no climate warming whatsoever." Richard Lindzen signed both declarations.²⁰

After its conference in March 2008, the Heartland Institute upheld the tradition by issuing a "Manhattan Declaration on Climate Change." Among its conclusions were:

Carbon dioxide is not a pollutant but rather a necessity for all life...assertions of a supposed 'consensus' among climate experts are false...warmer weather is generally less harmful to life on Earth than colder...there is no convincing evidence that CO2 emissions from modern industrial activity has in the past, is now, or will in the future cause catastrophic climate change...We recommend that world leaders reject the views expressed by the United Nations Intergovernmental Panel on Climate Change as well as popular, but misguided works such as "An Inconvenient Truth" [and] that all taxes, regulations, and other interventions intended to reduce emissions of CO2 be abandoned forthwith.²¹

As we will learn, scientists have long disproven each of the alleged statements of fact in that statement. Moreover, since the Intergovernmental Panel on Climate Change (IPCC) and Al Gore jointly won the 2007 Nobel Peace Prize, it is unlikely that world leaders will reject their views.

The three declarations are most useful in revealing how the deniers operate. They:

- Engage in publicity stunts designed to gain media attention but that make no scientific contribution whatsoever.
- Repeat claims long after scientists have shown them to be false.
- Make false assertions without presenting the evidence to back them up. Had a speaker at the AGU meeting said that carbon dioxide does not cause global warming, the audience would have demanded to see the evidence. Its absence would have exposed the speaker as a fool or a charlatan.
- Have no scientific findings that falsify global warming.
- Have in many cases opposed global warming for twenty years, regardless of the growing evidence. True, back then, many scientists were also skeptical, but as the evidence mounted relentlessly, they changed their minds. The deniers never change their minds, a sure sign that they base their denial not on science, but on ideology. To paraphrase Lindzen, global warming denial has always been about politics, not science.

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As evidence for the last point, over the fall of 2008 and the ensuing winter, the press and scientific journals reported a number of new findings that showed that global warming was moving faster than scientists had thought even two years earlier. Speakers at the March 2009 Heartland Institute conference had access to this new evidence, but it had no effect on their presentations or their denial. Everything they said at the 2009 conference they could have said at the 2008 conference, and many did.

Consider this list of new findings that the deniers should have considered:

- Nature and Science Magazines: Sea level "most likely" to rise 0.8 to 2.0 meters by 2100. (Fall 2008.)
- U.S. Geological Survey: Sea-level rise in 2100 will likely "substantially exceed" IPCC projections. (December 2008.)
- Britain's Hadley Center: "Catastrophic 9-12.6°F (5-7°C) warming by 2100 on current emissions path." (December 2008.)
- MIT: Projection of global warming by 2100 doubles to 9.2°F (5.1°C.)" (February 2009.)
- Australian newspaper reports: Worst drought in Australia's history. On January 29, 2009, South Australia had its hottest nighttime temperature on record. Wildfires devastated the region and over 200 died, some incinerated in their cars.

- American Association for the Advancement of Science:
Climate change is coming much harder, much faster than predicted. (February 2009.)
- National Oceanographic and Atmospheric Administration (NOAA): Climate change "largely irreversible for 1,000 years," with permanent Dust Bowls in Southwest and around the globe. (February 2009.)
- IPCC in 2009: "Worst-case IPCC scenario trajectories (or even worse) are being realized." 2000 IPCC scientists meeting in Copenhagen to update the 2007 report. (March 2009.)
- NOAA: January and February 2009 warmer than in any year on record. (March 2009.)
- Environmental Protection Agency (EPA): Global warming a public danger. (March 2009.)

One claim of the deniers, repeatedly incessantly at the 2009 Heartland Institute conference, is that the IPCC exaggerated the case for global warming and the dangers it poses. But this new evidence showed that just the opposite is true: the IPCC underestimated the speed and danger of global warming.

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Science seeks the truth about Nature. In the process, scientists follow false trails and have to backtrack. They make mistakes; groupthink sometimes blinkers them from the truth. But the scientific method eventually exposes the inevitable mistakes. Even then, some cling to the old ways, taking their

outmoded beliefs with them to the grave. But science does not wait for the dissenters to catch up.

Most professions can be no better than their individual practitioners, but Science is far better than scientists. It is the best system we have for getting beyond human frailty and folly to the truth. Those who trample science are always in time the ones who suffer. Who stands higher in the courtroom of history: Galileo, or his inquisitors?

Endnotes

- ¹ Boykoff, M. T. and J. M. Boykoff (2004). "Balance as bias: global warming and the US prestige press." Global environmental change: human and policy dimensions **14**, p. 125-136
- ² Stern, N. H. (2006). Stern review on the economics of climate change. London, HM Treasury Executive Summary
- ³ http://www.harrisinteractive.com/harris_poll/index.asp?pid=406
- ⁴ <http://pewresearch.org/pubs/1276/science-survey>
- ⁵ <http://www.gallup.com/poll>
- ⁶ Romm, J. J. (2008). Hell and high water: the global warming solution. New York, Harper Perennial
- ⁷ Oxford University Press (1979). The Oxford dictionary of quotations. 3d ed. Oxford; New York, Oxford University Press, p. 24
- ⁸ Huxley, T. H. and P. M. Buck, Jr. (1910). Selected essays and addresses of Thomas Henry Huxley. New York, The Macmillan Company, p. 49
- ⁹ Russell, B. (1961). History of Western Philosophy, Allen and Unwin, p. 514
- ¹⁰ Presentation at the Heartland Institute Conference by former Senator Harrison Schmitt.
- ¹¹ "Global Warming Has Begun, Expert Tells Senate." Philip Shabecoff, New York Times, Friday June 24, 2008
- ¹² <http://www.earthsky.org/>
- ¹³ Hansen's slides can be downloaded at www.columbia.edu/~jeh1
- ¹⁴ Broecker, W. S. (1975). "Climatic Change: Are We on the Brink of a Pronounced Global Warming?" Science **189**, p. 460-463
- ¹⁵ Broecker, W. S. and R. Kunzig (2009). Fixing climate : what past climate changes reveal about the current threat--and how to counter it. New York, Hill and Wang
- ¹⁶ Broecker, W. S. (2008). "Shifting Rainfall: A Paleo Perspective." EOS **89**, p.
- ¹⁷ <http://www.heartland.org/events/NewYork09/index.html>
- ¹⁸ <http://www.heartland.org/events/NewYork09/proceedings.html>
- ¹⁹ <http://www.heartland.org/events/NewYork09/proceedings.html>
- ²⁰ Both are available at <http://www.sepp.org/>
- ²¹ <http://www.heartland.org/policybot/>