A PUBLICATION OF HILLSDALE COLLEGE

Imprimis

OVER 1,250,000 READERS MONTHLY

August 2007 . Volume 36, Number 8

Global Warming: Man-Made or Natural?

S. Fred Singer

Professor Emeritus of Environmental Sciences, University of Virginia

S. FRED SINGER is professor emeritus of environmental sciences at the University of Virginia, a distinguished research professor at George Mason University, and president of the Science and Environmental Policy Project. He performed his undergraduate studies at Ohio State University and earned his Ph.D. in Physics from Princeton University. He was the founding dean of the School of Environmental and Planetary Sciences at the University of Miami, the founding director of the U.S. National Weather Satellite Service, and served for five years as vice chairman of the U.S. National Advisory Committee on Oceans and Atmosphere. Dr. Singer has written or edited over a dozen books and monographs, including, most recently, *Unstoppable Global Warming: Every 1,500 Years.*

The following is adapted from a lecture delivered on the Hillsdale College campus on June 30, 2007, during a seminar entitled "Economics and the Environment," sponsored by the Charles R. and Kathleen K. Hoogland Center for Teacher Excellence.

In the past few years there has been increasing concern about global climate change on the part of the media, politicians, and the public. It has been stimulated by the idea that human activities may influence global climate adversely and that therefore corrective action is required on the part of governments. Recent evidence suggests that this concern is misplaced. Human activities are not influencing the global climate in a perceptible way. Climate will continue to change, as it always has in the past, warming and cooling on different time scales and for different reasons, regardless of human action. I would also argue that—should it occur—a modest warming would be on the whole beneficial.

This is not to say that we don't face a serious problem. But the problem is political. Because of the mistaken idea that governments can and must do something about climate, pressures *are* building that have the potential of distorting energy policies in a way that will severely damage national economies, decrease standards of living, and increase poverty. This misdirection of resources will adversely affect human health and welfare in industrialized nations, and even more in developing nations. Thus it could well lead to increased social tensions within nations and conflict between them.

If not for this economic and political damage, one might consider the present concern about climate change nothing more than just another environmentalist fad, like the Alar a or the global cooling fears of the 1970s. Given that so much is at stake, however, it is that people better understand the issue.

Man-Made Warming?

The most fundamental question is scientific: Is the observed warming of the past 30 years due to natural causes or are human activities a main or even a contributing factor?

At first glance, it is quite plausible that humans could be responsible for warming the climate. After all, the burning of fossil fuels to generate energy releases large quantities of carbon dioxide into the atmosphere. The CO_2 level has been increasing steadily since the beginning of the industrial revolution and is now 35 percent higher than it was 200 years ago. Also, we know from direct measurements that CO_2 is a "greenhouse gas" which strongly absorbs infrared (heat) radiation. So the idea that burning fossil fuels causes an enhanced "greenhouse effect" needs to be taken seriously.

But in seeking to understand recent warming, we also have to consider the natural factors that have regularly warmed the climate prior to the industrial revolution and, indeed, prior to any human presence on the earth. After all, the geological record shows a persistent 1,500-year cycle of warming and cooling extending back at least one million pars.

In identifying the burning of fossil fuels as the chief cause of warming today, many politicians and environmental activists simply appeal to a so-called "scientific consensus." There are two things wrong with this. First there is no such consensus: An increasing number of climate scientists are raising serious questions about the political rush to judgment on this issue. For example, the widely touted "consensus" of 2,500 scientisb on the United Nations Intergovernmental Panel on Climate Change (IPCC) is an illusion: Most of the panelists have no scientific qualifications, and many of the others object to some part of the IPCC's report. The Associated Press reported recently that only 52 climate scientists contributed to the report's "Summary for Policymakers."

Likewise, only about a dozen members of the governing board voted on the "consemus statement" on climate change by the American Meteomlogical Society (AMS). Rank and file AMS scientists never had a say, which is why so many of them are now openly rebelling. Estimates of skepticism within the AMS regarding man-made global warming are well over 50 percent.

The second reason not to rely on a "scientific consensus" in these matters is that this is not how science works. After all, scientific advances c u s tomarily come from a minority of scientists who challenge the majority view—or even just a single person (think of Galileo or Einstein), Science proceeds by the scientific method and draws conclusions based *on* evidence, not on a show of hands.

But aren't glaciers melting? Isn't sea ice shrinking? Yes, but that's not proof for human-caused warming. Any kind of warming, whether natural or human-caused, will melt ice. To assert that melting glaciers prove human causation is just bad logic.

What about the fact that carbon dioxide levels *are* increasing at the same time temperatures are rising? That's an interesting correlation; but as every scientist knows, correlation is not causation. During much of the last century the climate was *cooling* while CO_2 levels were rising. And we should note that the climate has not warmed in the past eight years, even though greenhouse gas levels have increased rapidly.

What about the fact — as cited by, among others, those who produced the IPCC port-that every major greenhouse computer model (there are two dozen or so) shows a large temperature increase due to human burning of fossil fuels? Fortunately, there is a scientific way of testing these models to see whether current warming is due to a mall-made greenhouse effect. It involves comparing

Imprimis (im-pri-mis), [Latin]: in the first place

EDITOR
Douglas A. Jeffrey

DEPUTY EDITOR
Timothy W. Caspar

COPY EDITORS
Monica VanDerWeide
Jeremy Young

ART DIRECTOR
Angela Lashaway

PRODUCTION MANAGER
Lucinda Grimm

CIRCULATION MANAGER
Patricia A. DuBois

STAFF ASSISTANTS
Kim Jackson
Wanda Oxenger
Kim Tedders

SUBSCRIPTION FREE UPON REQUEST.

ISSN 0277-8432

Imprimis trademark registered in U.S. Patent and Trade Office #1563325.

the actual or observed *pattern* of warming with the warming pattern predicted by or calculated from the models. Essentially, we try to see if the "fingerprints" match—"fingerprints" meaning the rates of warming at different latitudes and altitudes.

For instance, theoretically, greenhouse warming in the tropics should register at increasingly high rates as one moves from the surface of the earth up into the atmosphere, peaking at about six miles above the earth's surface. At that point, the level should be greater than at the surface by about a factor of three and quite pronounced, according to all the computer models. In reality, however, there is no increase at all. In fact, the data from balloon-borne radiosondes show the very opposite: a slight *decrease* in warming over the equator.

The fact that the observed and predicted patterns of warming don't match indicates that the man-made greenhouse contribution to current temperature change is insignificant. This fact emerges from data and graphs collected in the Climate Change Science Program Report 1.1, published by the federal government in April 2006 (see www.climatescience.gov/Library/sap/sap1-1/finalreport/default.htm). It is remarkable and puzzling that few have noticed this disparity between observed and predicted patterns of warming and drawn the obvious scientific conclusion.

What explains why greenhouse computer models predict temperature trends that are so much larger than those observed? The answer lies in the proper evaluation of feedback within the models. Remember that in addition to carbon dioxide, the real atmosphere contains water vapor, the most powerful greenhouse gas. Every one of the climate models calculates a significant positive feedback fmm water vapor—i.e., a feedback that amplifies the warming effect of the CO_2 increase by an average factor of two or three. Hut it is quite possible that the water vapor feedback is negative rather than positive and thereby *reduces* the effect of increased CO_2.

There are several ways this might occur. For example, when increased CO_2 produces a warming of the ocean, a higher rate of evaporation might lead to more humidity and cloudiness (provided the atmosphere contains a sufficient number of cloud condensation nuclei). These low clouds reflect incoming solar radiation back into space and thereby cool the earth. Climate researchers have discwered other possible feedbacks and are busy evaluating which ones enhance and which diminish the effect of increasing CO_2.

Natural Causes of Warming

A quite different question, but scientifically interesting, has to do with the natural factors influencing climate. This is a big topic about which much has been written. Natural factors include continental drift and mountain-building, changes in the Earth's orbit, volcanic eruptions, and solar variability. Different factors operate on different time scales. But on a time scale important for human experience—a scale of decades, let's say—solar variability may be the most important.

Solar influence can manifest itself in different ways: fluctuations of solar irradiance (total energy), which has been measured in satellites and related to the sunspot cycle; variability of the ultraviolet portion of the solar spectrum, which in turn affects the amount of ozone in the stratosphere; and variations in the solar wind that modulate the intensity of cosmic rays (which, upon impact into the earth's atmosphere, produce cloud condensation nuclei, affecting cloudiness and thus climate).

Scientists have been able to trace the impact of the sun on past climate using proxy data (since thermometers are relatively modern). A conventional proxy for temperature is the ratio of the heavy isotope of oxygen, Oxygen-18, to the most common form, Oxygen-16.

A paper published in *Nature* in 2001 describes the Oxygen-18 data (reflecting temperature) from a stalagmite in a cave in Oman, covering a period of over 3,000 years. It also shows corresponding Carbon-14 data, which are directly related to the intensity of cosmic rays striking the earth's atmosphere. One sees there a remarkably detailed correlation, almost on a year-by-year basis. While such research cannot establish the detailed mechanism of climate change, the causal connection is quite clear: Since the stalagmite temperature cannot affect the sun, it is the sun that affects climate.

Policy Consequences

If this line of reasoning is correct, human-caused increases in the CO_2 level are quite insignificant to climate change. Natural causes of climate change, for their part, cannot be controlled by man. They are unstoppable. Several policy consequences would follow from this simple fact:

> Regulation of CO_2 emissions is pointless and even counterproductive, in that no matter what kind of mitigation scheme is used, such regulation is hugely expensive,

> The development of non-fossil fuel energy sources, like ethanol and hydrogen, might be counterproductive, given that they have to be manufactured, often with the investment of great amounts of ordinary energy. Nor do they offer much reduction in oil imports.

> Wind power and solar power become less attractive, being uneconomic and requiring huge subsidies.

> Substituting natural gas for coal in electricity generation makes less sense for the same reasons.

None of this is intended to argue against energy conservation. On the contrary, conserving energy reduces waste, saves money, and lowers energy prices—irrespective of what one may believe about global warming.

Science vs. Hysteria

You will note that this has been a rational discussion. We asked the important question of whether there is appreciable man-made warming today, We presented evidence that indicates there is not, thereby suggesting that attempts by governments to control greenliouse-gas emissions are pointless and unwise. Nevertheless, we have state governors calling for CO_2 emissions limits on cars; we have city mayors calling for mandatory CO_2 controls; we have the Supreme Court declaring CO_2 a pollutant that may have to be regulated; we have every industrialized nation (with the exception of the U.S. and Australia) signed on to the Kyoto Protocol; and we have ongoing international demands for even more stringent controls when Kyoto expires in 2012. What's going on here?

To begin, perhaps even some of the advocates of these anti-warming policies are not so serious about them, as seen in a feature of the Kyoto Protocol called the Clean Development Mechanism, which allows a CO_2 emitter—i.e., an energy user—to support a fanciful CO_2 reduction scheme in developing nations in exchange for the right to keep on emitting

CO_2 unabated. "Emission trading" among those countries that have ratified Kyoto allows for the sale of certificates of unused emission quotas. In many cases, the initial quota was simply given away by governments to power companies and other entities. which in turn collect a windfall fee from consumers. All of this has become a huge financial racket that could someday make the UN's "Oil for Food" scandal in Iraq seem minor by comparison. Even more fraudulent, these schemes do not reduce total CO_2 emissions—not even in theory.

It is also worth noting that tens of thousands of interested persons benefit directly from the global warming scare—at the expense of the ordinary consumer. Environmental organizations globally, such as Greenpeace, the Sierra Club, and the Environmental Defense Fund, have raked in billions of dollars. Multi-billion-dollar government subsidies for useless mitigation schemes are large and growing. Emission trading programs will soon reach the $100 billion a year level, with large fees paid to brokers and those who operate the scams. In other words, many people have discovered they can benefit from climate scares and have formed an entrenched interest. Of course, there are also many sincere believers in an impending global warming catastrophe, spurred on in their fears by the growing number of one-sided books, movies, and media coverage.

The irony is that a slightly warmer climate with more carbon dioxide is in many ways beneficial rather than damaging. Economic studies have demonstrated that a modest warming and higher CO_2 levels will increase GNP and raise standards of living, primarily by improving agriculture and forestry. It's a well-known fact that CO_2 is plant food and essential to the growth of crops and trees—and ultimately to the well-being of animals and humans.

You wouldn't know it from Al Gore's *An Inconvenient Truth*, but there are many upsides to global warming: Northern homes could save on heating fuel. Canadian farmers could harvest bumper crops. Greenland may become awash in cod and oil riches. Shippers could count on an Arctic shortcut between the Atlantic and Pacific. Forests may expand. Mongolia could become an economic superpower. This is all speculative, even a little facetious. Rut still, might there be a silver lining for the frigid regions of Canada and Russia? "It's not that there won't be bad thing happening in those countries." economics professor Robert O. Mendelsohn of the Yale School of Forestry & Environmental Studies says. "But the idea is that they will get such large gains, especially in agriculture, that they will be bigger than the losses." Mendelsohn has looked at how gross domestic product around the world would be affected under different warming scenarios through 2100. Canada and Russia tend to come out as clear gainers, as does much of northern Europe and Mongolia, largely because of projected increases in agricultural production.

To repeat a point made at the beginning: Climate has been changing cyclically for at least a million years and has shown huge variations over geological time. Human beings have adapted well, and will continue to do so.

* * *

The nations of the world face many difficult problems. Many hive societal problems like poverty, disease, lack of sanitation, and shortage of clean water. There are grave security problems arising from global terrorism and the proliferation of nuclear weapons. Any of these problems *are* vastly more important than the imaginary problem of man-made global warming. It is a great shame that so many of our resources are being diverted from real problems to this non-problem. Perhaps in ten or 20 years this will become apparent to everyone, particularly if the climate should stop warming (as it has for eight years now) or even begin to cool.

We can only trust that reason will prevail in the face of an onslaught of propaganda like Al Gore's movie and despite the incessant misinformation generated by the media. Today, the imposed costs are still modest, and mostly hidden in taxes and in charges for electricity and motor fuels. If the scaremongers have their way, these costs will become enormous. But I believe that sound science and good sense will prevail in the face of irrational and scientifically baseless climate fears.