

BRIEF ANALYSIS

No. 299

For immediate release:

Wednesday, June 30, 1999

The Collapsing Scientific Cornerstones of Global Warming Theory

In 1988, James Hansen, director of NASA's Goddard Institute of Space Studies, testified before the Senate that based on computer models and temperature measurements he was "99 percent sure . . . the [human caused] greenhouse effect has been detected and it is changing our climate now." His statement was widely covered by the media and brought the term "global warming" to the general public's attention for the first time. Many of his colleagues thought, and still think, that his announcement was premature at best and rash at worst. But critics received little attention in the rush to publicize this most apocalyptic of all environmental threats.

The basis of global warming theory. Hansen and other proponents of the theory that humans are causing a dangerous change in the earth's climate base their belief on several sets of data (e.g., temperatures, greenhouse gas levels and climate phenomena). For example:

- Ground-level temperature measurements show the earth has warmed between 0.3 degrees and 0.6 degrees Celsius in the last century.
- Atmospheric carbon dioxide (CO₂), a primary greenhouse gas, has increased by approximately 30 percent in the last century and a half.

Using these facts to simulate atmospheric conditions in computerized climate models, some scientists infer that the earth's current warming is due to the increase in atmospheric CO₂ caused primarily by the use of fossil

fuels (oil, coal and gas). According to the models, absent a sharp and immediate reduction in the level of CO₂ emissions, the earth will warm a further 0.8 degrees to 3.5 degrees Celsius over the next 100 years. Proponents of the models argue the earth's warming will cause such calamities as rising ocean levels from melting polar ice caps, increased hurricane activity and severe droughts.

Global warming theory rests on three cornerstones: climate models, scientific analyses of past and present climate data and trends, and the assertion that increases in greenhouse gases drive up global temperatures. However, recent scientific discoveries are chipping away at these cornerstones.

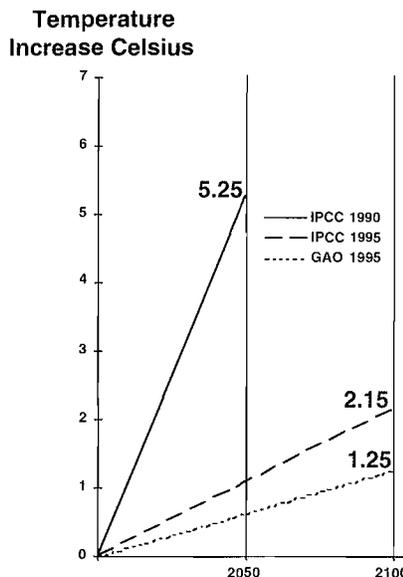
er, recent scientific discoveries are chipping away at these cornerstones.

Eroding Cornerstone: Temperature trends and climate models match. The increase in the earth's surface temperature during the past 150 years is far less than the best climate models predicted.

Based on models, the Intergovernmental Panel on Climate Change predicted in 1990 that if no further action were taken to curb greenhouse gas emissions, we could expect an increase in temperature between 4.5 degrees and 6.0 degrees Celsius by 2100. In 1996 a new IPCC prediction was for an increase of 0.8 degrees to 3.5 degrees Celsius by 2100 — less than half the warming in twice the time. A U.S. government survey of the global climate model literature con-

ducted predicted even less warming — between 0.5 degrees and 2.0 degrees Celsius by 2100. [See the figure.] With every new report the range of warming falls, which implies that the early models on which the most catastrophic claims were based were crude predictors of global climate change.

Mid-range Predicted Temperature Rise from Global Warming Models



Source: IPCC, "Climate Change 1990, 1995;" GAO, "Global Warming Limitations of General Circulation Models and Cost of Modeling Efforts, 1995."

BRIEF ANALYSIS

No. 299

Page 2

As the models improve they show less and less warming — which is in line with actual temperature data — and a reduced likelihood of harmful environmental events. Yet even the improved climate models are flawed. When the models' past and present temperature estimates are compared to actual past and present temperature measurements, the models are off by more than a degree. If the models cannot describe past or present temperatures correctly, why should we base public policy decisions on their predictions of future temperatures?

Eroding Cornerstone: Natural climate change takes thousands of years. Environmentalists have argued that the slight surface warming of just over 1 degree Fahrenheit the earth has experienced since the mid-1800s must be the result of human activities, since natural temperature changes this substantial occur over hundreds or even thousands of years. But a study published in the October 2, 1998, issue of *Science* showed that around 12,500 years ago global temperature rose by more than 20 degrees in approximately 50 years. This natural change was more than 10 times the “catastrophic” warming environmentalists claim humans are causing — and it occurred in half the time. The finding confirms that global climate can change dramatically within a very short period and can do so absent human influence.

Eroding Cornerstone: Increased CO₂ emissions, primarily from the United States, are responsible for current surface warming. Environmentalists also have argued that since the United States is the largest emitter of CO₂, the greenhouse gas of primary concern, it should take the lead in reducing emissions of greenhouse gases. Unfortunately for their argument, it turns out that the U.S. is in fact a leading “air filter.” According to an October 16, 1998, article in *Science*, North America removes more carbon (about 2 billion tons) from the atmosphere than it emits (1.5 billion tons) each year. One reason is the tremendous regrowth in the eastern U.S. of forests that act as carbon sinks, removing CO₂ from the atmosphere.

Even more damaging to the environmentalists' argument is the fact that most of the warming over the last century occurred before 1940 — preceding the vast majority of human-caused carbon dioxide emissions worldwide. Global warming alarmists have been unable

to explain this mismatch between warming theory and scientific data.

Two scientific papers published in March of this year may explain the mismatch quite well. In the March 11 issue of *Nature*, scientists report that contrary to the belief that both CO₂ and global temperature have remained fairly constant during the last 11,000 years, global temperature has remained relatively stable ($\pm 1/2$ degree Fahrenheit from the average), but CO₂ levels have varied greatly.

In a March 12, 1999, paper in *Science*, a team of researchers concluded that when the earth shifts from glacial to warm periods, as it does every 100,000 years or so, temperature rise consistently precedes increased CO₂ levels by between 400 and 1,000 years. This finding is at odds with global warming theory and the idea that increased levels of CO₂ force climate temperatures upward, but it does correspond with reality. The earth came out of a “Little Ice Age” during the middle of the last century. During that time global temperature was about 1 degree cooler than at present. If the current research is correct, one could surmise that the temperature increase at the end of the Little Ice Age has, like previous warming, preceded an entirely natural increase in CO₂. While human activities have probably contributed to the current CO₂ increase, the link between that increase and warmer temperatures becomes more uncertain with each new scientific discovery.

Conclusion. James Hansen, whose 1988 pronouncements started the clamor for action to prevent global warming, wrote in the 1998 *Proceedings of the National Academy of Sciences* that “the forcings that drive long-term climate change are not known with accuracy sufficient to define future climate change.” So much for being sure.

While the theory of global warming still may be correct, new evidence chipping away at its cornerstones should preclude precipitous, costly and perhaps unnecessary government actions. Whether human-induced climate change is occurring and, if so, what response is appropriate are questions that merit further research.

This brief analysis was written by NCPA Senior Policy Analyst H. Sterling Burnett.