Dissent in the Maelstrom

Maverick meteorologist Richard S. Lindzen keeps right on arguing that human-induced global warming isn't a problem By DANIEL GROSSMAN

KATHLEEN DOOHER

RICHARD S. LINDZEN: CLIMATE SKEPTIC

- Born in 1940 and grew up in New York City; married with two children.
- Degrees from Harvard University; holds the endowed Alfred P. Sloan Professor of Meteorology chair at M.I.T.
- What he would do to global warming research if he held the federal purse strings: cut funding. "You would no longer have vested interests in the problem remaining" if funds were scarcer.

Adviser to senators, think tanks and at least some of the president's men, Richard S. Lindzen holds a special place in the today's heated debate about global warming. An award-winning scientist and a member of the National Academy of Sciences, he holds an endowed chair at the Massachusetts Institute of Technology and is the nation's most prominent and vocal scientist in doubting whether human activities pose any threat at all to the climate. Blunt and acerbic, Lindzen ill-tolerates naïveté. So it was with considerable trepidation recently that I parked in the driveway of his suburban home.

A portly man with a bushy beard and a receding hairline, Lindzen ushered me into his living room. Using a succession of cigarettes for emphasis, he explains that he never intended to be outspoken on climate change. It all began in the searing summer of 1988. At a high-profile congressional hearing, physicist James E. Hansen of the NASA Goddard Institute for Space Studies went public with his view: that scientists knew, "with a high degree of confidence," that human activities such as burning fossil fuel were warming the world. Lindzen was shocked by the media accounts that followed. "I thought it was important," he recalls, "to make it clear that the science was at an early and primitive stage and that there was little basis for consensus and much reason for skepticism." What he thought would be a couple of months in the public eye has turned into more than a decade of climate skepticism. "I did feel a moral obligation," remarks Lindzen of the early days, "although now it is more a matter of being stuck with a role."

It may be just a role, but he still plays it with gusto. His wide-ranging attack touches on computer modeling, atmospheric physics and research on past climate. His views appear in a steady stream of congressional testimonies, newspaper op-eds and public appearances. Earlier this year Lindzen gave a tutorial on climate change to President George W. Bush's cabinet.

It's difficult to untangle how Lindzen's views differ from those of other scientists because he questions so

CLOUD COVER over the Amazon basin and other tropical areas cools the planet, Lindzen argues. Other researchers think it heats the Earth.

much of what many other scientists regard as settled. He fiercely disputes the conclusions of this past spring's third report of the Intergovernmental Panel on Climate Change (IPCC)—considered by many investigators to be the definitive scientific assessment of climate change—and those of a recent NAS report that reviewed the panel's work. (Lindzen was a lead author of one chapter of the IPCC report and was an author of the NAS report.) But, according to him, the country's leading scientists (who, he says, concur with him) prefer not to wade into the troubled waters of climate change: "It's the kind of pressure that the average scientist doesn't need." Tom M. L. Wigley, a leading climate scientist at the National Center for Atmospheric Research, says it is "demonstrably incorrect" that top researchers are keeping quiet. "The best people in the world," he states, have contributed to the IPCC's reports.

Lindzen agrees with the IPCC and most other climate scientists that the world has warmed about 0.5 degree Celsius over the past 100 years or so. He agrees that human activities have increased the amount of carbon dioxide in the atmosphere by about 30 percent. He parts company with the others when it comes to whether these facts are related. It's not that humans have no effect at all on climate. "They do," he admits, though with as much impact on the environment as when "a butterfly shuts its wings."

The IPCC states that "most of the observed warming over the last 50 years" is of human origin. The report says that late 20th-century temperatures shot up above anything the earth had experienced in the previous 1,000 years. Michael E. Mann, a geologist at the University of Virginia and a lead author of the IPCC's past-climate chapter, calls the spike "a change that is inconsistent with natural variability." Lindzen dismisses this analysis by questioning the method for determining historical temperature. For the first 600 years of the 1,000-year chronology, he claims, researchers used only tree rings to gauge temperature and only those from four separate locations. He calls the method used to turn tree-ring width into temperature hopelessly flawed.

Mann was flabbergasted when I questioned him about Lindzen's critique, which he called "nonsense" and "hogwash." A close examination of the IPCC report itself shows, for instance, that trees weren't the only source of data—ice cores helped to reconstruct the temperatures of the first 600 years, too. And trees were sampled from 34 independent sites in a dozen distinct regions scattered around the globe, not four.

Past climate isn't the only point of divergence. Lindzen also says there is little cause for concern in the future. The key to his optimism is a parameter called "climate sensitivity." This variable represents the increase in global temperature expected if the amount of carbon dioxide in the air doubles over preindustrial levels—a level the earth is already one third of the way toward reaching. Whereas the IPCC and the NAS calculate climate sensitivity to be somewhere between 1.5 and 4.5 degrees C, Lindzen insists it is in the neighborhood of 0.4 degree.

The IPCC and the NAS derived the higher range after incorporating positive feedback mechanisms. For instance, warmer temperatures will most likely shrink the earth's snow and ice cover, making the planet less reflective and thus hastening warming, and will also probably increase evaporation of water. Water vapor, in fact, is the main absorber of heat in the atmosphere.

But such positive feedbacks "have neither empirical nor theoretical foundations," Lindzen told the U.S. Senate Commerce Committee this past May. The scientist says negative, not positive, feedback rules the day. One hypothesis he has postulated is that increased warming actually dries out certain parts of the upper atmosphere. Decreased water vapor would in turn temper warming. Goddard's Hansen says that by raising this possibility Lindzen "has done a lot of good for the climate discussion." He hastens to add, however, "I'm very confident his basic criticism—that climate models overestimate climate sensitivity—is wrong."

To Lindzen, climate research is "polluted with politic rhetoric"—the science remains weak.

In March, Lindzen published what he calls "potentially the most important" paper he's written about negative feedback from water vapor. In it, he concludes that warming would decrease tropical cloud cover. Cloud cover is a complicated subject. Depending on factors that change by the minute, clouds can cool (by reflecting sunlight back into space) or warm (by trapping heat from the earth). Lindzen states that a reduction in tropical cloudiness would produce a marked cooling effect overall and thus serve as a stabilizing negative feedback.

But three research teams say Lindzen's paper is flawed. For instance, his research was based on data collected from satellite images of tropical clouds. Bruce A. Wielicki of the NASA Langley Research Center believes that the images were not representative of the entire tropics. Using data from a different satellite, Wielicki and his group conclude, in a paper to appear in the *Journal of Climate,* that on balance warmer tropical clouds would have a slight heating, not a cooling, effect.

Looking back at the past decade of climate science, many researchers say computer models have improved, estimates of past climate are more accurate, and uncertainty is being reduced. Lindzen is not nearly so sanguine. In his mind the case for global warming is as poor as it was when his crusade began, in 1988. Climate research is, he insists, "heavily polluted by political rhetoric with evidence remaining extremely weak." To Lindzen, evidently, the earth will take care of itself. SA