



**TESTIMONY OF DR. S. FRED SINGER,  
ATMOSPHERIC PHYSICIST; PRESIDENT,  
THE SCIENCE & ENVIRONMENTAL POLICY PROJECT**

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**TO THE HOUSE COMMERCE COMMITTEE  
SUBCOMMITTEE ON OVERSIGHT AND INVESTIGATIONS  
August 1, 1995**

Mr. Chairman, Ladies and Gentlemen,

My name is S. Fred Singer. I am professor emeritus of environmental sciences at the University of Virginia and the founder and president of The Science & Environmental Policy Project in Fairfax, Virginia.

**My Relevant Background:**

I hold a degree in engineering and a Ph.D. in physics. I have specialized in atmospheric and space physics. My professional career includes the early design of satellites, for which I received a Special Commendation from President Eisenhower. I established the U.S. Weather Satellite Service in 1962, was its first director, and received a Gold Medal award from the Dept. of Commerce. I devised the instrument that is currently used to measure stratospheric ozone from satellites.

As a Deputy Assistant Administrator of the U.S. Environmental Protection Agency in 1971, I chaired an interdepartmental panel of scientists looking into the possible effects of a proposed fleet of supersonic transports (SSTs) on stratospheric ozone. Ours was the first group to examine the issue of possible damage to the ozone layer and its health consequences, including skin cancers. During the 1980s, while serving as Chief Scientist of the Department of Transportation, I provided expert advice to the White House Science Adviser on the effects of man-made substances on the ozone layer.

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### Outline of Testimony:

This morning I would like to review with you very briefly the current status of the science, mentioning a scenario that does not accord with current control policy, and then touch on three topics: First, I want to state clearly that there is no scientific consensus on ozone depletion or its consequences. Next, I want the record to show that the 1987 Montreal Protocol [on Substances that Deplete the Ozone Layer] was negotiated without adequate concern for scientific evidence. Finally, I want to comment on why it makes no scientific sense at this time to phase out methyl bromide.

### Scientific Summary:

The bottom line is this: Currently available scientific evidence does not support a ban on the production of chlorofluorocarbons (CFCs or Freons), halons, and especially methyl bromide. There certainly is no justification for the accelerated phase-out of CFCs, which was instituted in 1992 on nothing more than a highly questionable NASA press conference.

In fact, the history of the CFC-Ozone depletion issue is rife with selective use of data, faulty application of statistics, disregard of contrary evidence, and other scientific distortions. The policy before and since the Montreal Protocol has been driven by wild and irresponsible scare stories: EPA's estimate of 3 million additional skin cancer deaths, blind sheep in Chile, plankton death, the disappearance of frogs--all passed along to the public by an uncritical news media.

The hypothesis that CFCs deplete ozone is still just that: a hypothesis. The theory did not predict the Antarctic ozone hole and cannot predict what will happen globally. There is no firm evidence as yet for a long-term depletion of global ozone. Much of data is contaminated; the ozone record is dominated by large, natural fluctuations on many time scales; and there are even long-term changes of natural origin extending over decades. In spite of what you may have read, there is no credible evidence for a long-term increase of ultraviolet radiation at the earth's surface--as a result of a depletion of ozone. And finally, laboratory experiments have now established that malignant melanoma, the deadly form of skin cancer, may be caused by a band of ultraviolet radiation that is not absorbed by ozone at all.

### A Different Scenario:

Are halocarbons, like CFCs, really the major culprit when it comes to ozone damage? Let me give you a very different scenario, but one which is also scientifically plausible. We saw the Antarctic ozone hole grow in size and extent quite suddenly between about 1978 and 1983. We know now that this phenomenon depends not only on the presence of chlorine--coming from natural and man-made sources--but in a crucial way also on the presence of ice crystals. These form when the humidity is high enough and the temperature low enough. The role of ice crystals as a catalyst was not predicted by the CFC-ozone depletion theory. Two researchers with the National Oceanographic and Atmospheric Administration earlier this year published evidence that stratospheric water vapor has been increasing for some time. I believe that the most likely source of the additional water vapor is methane gas added to the earth's atmosphere by human-related sources like cattle raising and rice growing, and natural sources like wetlands. Methane is, in fact, increasing in the earth's atmosphere, as I had predicted in 1971. We also know that the global stratosphere is cooling, probably as a result of the increase in carbon dioxide. It is quite possible, therefore, that the controlling factors in the creation of an ozone hole in the Antarctic--and potentially elsewhere--are methane and carbon dioxide rather than the growth in CFCs. If this is so, then ozone holes would persist, even in the absence of CFCs, because of the existing natural sources of chlorine.

For backup and more detail I refer you to numerous publications. Some are attached to my testimony and I ask that they be entered into the record.

### Scientific Consensus?

The argument put forth constantly in trying to substantiate ozone depletion is the notion of a scientific consensus. But "consensus" is a political concept, not a scientific one. Scientific truth is never arrived at by a show of hands; every advance has come from controversy. At one time there was "consensus" that the earth was flat, that the sun revolved around the earth, that the atom could not be split. More recently, consensus was claimed for the global warming issue. Yet the official report from the UN Intergovernmental Panel on Climate Change specifically mentions the existence of "minority" views that the editors could not, or perhaps would not, "accommodate."

During the summer of 1991, the Science & Environmental Policy Project surveyed a substantial number of IPCC contributors and reviewers. About half of the respondents said that the IPCC Summary did not reflect their views and might convey a misleading message to policymakers. Unfortunately, we have not had an opportunity to carry out a similar survey of the scientists associated with the UN Ozone Assessment.

### The Montreal Protocol Was Founded on Theoretical Speculation, not Firm Data

Turning to the matter of scientific support for the Montreal Protocol, we have the statements of the chief U.S. negotiator, State Department official Richard Benedick. In his book, *Ozone Diplomacy*, on page 2, we read: "Perhaps the most extraordinary aspect of the treaty was its imposition of substantial short-term economic costs...against unproved future dangers--dangers that rested on scientific theories rather than on firm data."

Again, on page 18: "In July 1987, practically on the eve of the final negotiating session in Montreal, NOAA concluded that the 'scientific community is currently divided as to whether existing data on ozone trends provides sufficient evidence... that a chlorine-induced ozone destruction is occurring.'" And further: "Writing in 1989, [Prof.] Sherwood Rowland, [an originator of the CFC-ozone theory and fervent advocate of a ban on CFCs,] observed that 'statistical evaluation through 1986 gave no indication of any trend in global ozone significantly different from no change at all.'"

Benedick does not mention the fact that, as late as 1988, published information on stratospheric chlorine showed no upward trend, thus indicating that neither CFCs nor other manmade chemicals were contributing significantly to the known natural sources, like volcanoes and oceans. An article by MIT professor Ronald Prinn in a book edited by Rowland, and published in 1988, makes this point quite clear.

It is evident from the above quotes that the negotiators and their scientific supporters were not the least bit inhibited by the absence of scientific information--or indeed by the presence of contrary information. To quote Benedick again, the negotiators were quite aware of the "very real short-run economic dislocations" but viewed the whole matter as an "unusual challenge to diplomacy". Indeed, the 1987 Montreal Protocol was to become the first example of an international treaty controlling the production and release of a manmade chemical.

### Phasing Out Methyl Bromide Makes No Sense:

Phasing out CFCs on an accelerated schedule would be bad enough, but a ban on methyl bromide makes absolutely no sense at this stage. There are at least three scientific arguments: (1) Unlike CFCs, which do contribute to stratospheric chlorine--along with many natural sources--we have no evidence that bromine or any of its compounds are increasing in the stratosphere. This is not surprising; bromine can hardly even be measured. (2) Unlike CFCs, methyl bromide enters the atmosphere mostly from natural sources in the world's oceans. (3) Finally, methyl bromide has an atmospheric lifetime of only a year, while CFCs survive for a century. In other words, if methyl bromide were ever found to cause a problem, it would disappear from the atmosphere one year after its production is stopped.

### A Common-Sense Conclusion:

Let's put the whole issue in perspective. Promoters of the ozone-CFC theory are projecting about 5 percent depletion. This would create a 10 percent increase in surface ultraviolet radiation--on a clear day. But UV naturally increases by some 5,000 percent from the poles to the equator because of the steepening angle of the sun. Therefore the projected UV increase from a worst-case global ozone depletion--the basis for all of these scare stories and an international policy that will conservatively cost the U.S. economy alone some \$100 billion dollars--can be experienced right now by moving just 60 miles closer to the equator, from Washington to Richmond.

The scare stories don't pass what I call the common-sense test. New Yorkers moving to Florida experience a more than 200 percent increase in UV. Why aren't they dropping like flies? Mail-order nurseries in the upper mid-west ship field-grown plants all over the United States. Why don't these plants die?

Promoters of the CFC-ozone depletion theory have insisted that governments must do something--even without scientific evidence--because if we don't do something now it will be too late. I disagree. If we don't know the extent of the problem--or even if it exists at all--then we cannot be sure that what we are doing will have any effect. We are flying blind on this issue--at a huge cost to the economy and ultimately to every household.