MERCHANTS OF DOUBT

How a Handful of Scientists Obscured the Truth on Issues from Tobacco Smoke to Global Warming

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and

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to organize his work. The outfit was initially affiliated with the Washington Institute for Values in Public Policy, which was itself financed by the Reverend Sun Myung Moon's Unification Church. The Unification Church was known for its passionate anti-Communism, perhaps an attraction to Singer. One of its supporters was Eugene Wigner, the Ph.D. advisor and mentor of Fred Seitz. The church owned a newspaper, the Washington Times, and it also operated a publisher, Paragon House. In the years to come, Singer would use both to expand the reach of his views.

In 1991, Singer reiterated his claim that the science of ozone depletion was too uncertain in the Washington Times and Consumers' Research Magazine. He also introduced a new argument: that the Ozone Trends Panel was wrong to use the "ground-based rather than the more accurate satellite ozone data." But we've seen that the satellite data had shown larger depletions, and that the panel had concluded that the higher satellite-derived depletion rate was an artifact of instrument decay in space (a phenomenon that should have been very familiar to Singer, given his origins in rocket research). If the panel had used the satellite data, Singer no doubt would have attacked them for ignoring the problem of instrument decay.

But whether or not they had any basis in fact, Singer's efforts began to bear fruit. In 1990, Dixy Lee Ray, a zoologist and former chair of the Atomic Energy Commission, as well as former governor of the state of Washington, was the lead author of the book Trashing the Planet: How Science Can Help Us Deal with Acid Rain, Depletion of Ozone, and Nuclear Waste (Among Other Things). Billed as an effort "to separate fact from factoid, to unmask the doom-crying opponents of all progress, and to re-establish a sense of reason and balance with respect to the environment and modern technology," it was a tirade against the environmental movement—and the science that supported it. Ray dismissed energy conservation and renewable energy, attacked toxic chemical "scares" promoted by environmentalists, and constructed a narrative that sedulously omitted the findings of the scientific experts and replaced them with the claims of professional critics and skeptics. Here's what she had to say about ozone.

Although there is widespread belief that the necessary chloride ion [that damages ozone] comes from chlorofluorocarbon this has not been unequivocally established. On the other hand, the eruption of Mount St. Augustine in 1976 injected 289 billion kilograms of hydrochloric acid directly into the stratosphere. That amount is 570 times the total world production of chlorine and fluorocarbon compounds in the year 1975. Mount Erebus, which is located just 15 kilometers upwind from McMurdo Sound, has been erupting, constantly, for the last 100 years, ejecting more than 1,000 tons (907,184 kg) of chlorine per day... We cannot be sure where the stratospheric chloride comes from, and whether humans have any effect upon it.

Where did she get these claims? Ray cited a 1989 article by Singer in his Global Climate Change, which she praised as one of only two "significant, critical contributions" to the subject of ozone depletion and global warming—the other being the National Acid Precipitation Assessment Program, which had nothing to do with either ozone or global warming. If you read Singer's paper, you find that he presented no original data. He had simply cited other papers, without explaining what those papers actually said.

The details about Mt. Erebus and Mt. Augustine can actually be found in two articles, published in 1989, by a man named Rogelio Maduro, in a political magazine called 21st Century Science and Technology, which is supported by Lyndon LaRouche's organization. In 1992, Maduro would publish a book, The Hole in the Ozone Scare: The Scientific Evidence that the Sky Isn't Falling, but the basic argument was already laid out in his 1989 work. Maduro had concluded that the ozone depletion theory was a "fraud" after interviewing Reid Bryson for an article on the "hoax" of global warming. Bryson, an expert on paleoclimate studies using pollen and tree rings—nothing to do with ozone—had told Maduro that Mt. Erebus erupted more chlorine into the atmosphere in a week than CFCs released in a year.

Ray had apparently confused chlorine emission to the atmosphere and chlorine concentration in the stratosphere. Mt. Erebus did produce substantial chlorine emissions, but it did not erupt explosively, so whatever chlorine it released did not get injected into the stratosphere; it would have to have been transported upward by tropospheric winds. Yet the Antarctic data collected by the two NASA/NOAA field expeditions showed very little chlorine in the troposphere and a great deal in the stratosphere. Moreover, balloon measurements showed that the bitterly cold stratospheric air was sinking, not rising, so there was simply no way that air masses carrying materials upward from Mt. Erebus could be the source of the chlorine.

Maduro's claims were published in an obscure source, and they might easily have vanished into obscurity—but for Dixy Lee Ray. When she repeated them in her book, they suddenly gained currency and credibility.
After all, she was a scientist, and had been chairman of the Atomic Energy Commission. Surely she was credible? The press thought so, as the mass media extensively reviewed the Trashing book. It sold well enough that Ray expanded it into a 1993 bestseller, Environmental Overkill. In addition to repeating the claims of the 1990 book, Ray expanded them, by insisting that CFCs were too heavy to rise into the stratosphere in the first place.82

Sherry Rowland was disturbed by the rapid spread of this misinformation and dedicated his 1993 AAAS presidential address to combating it.83 Without naming names, Rowland chided “senior scientists” for helping to spread such erroneous claims. Then he addressed specifics, starting with the idea that CFCs didn’t reach the stratosphere. In fact, CFCs had been measured “in literally thousands of stratospheric air samples by dozens of research groups all over the world.”84

Rowland also addressed the volcano red herring. First, he debunked the 1980 Science paper that had argued that a single eruption of Mt. Augustine, Alaska, in 1976 had put as much chlorine into the stratosphere as the entire 1975 CFC production. That claim was based on the chlorine content of ashfall, not on what had actually reached the stratosphere. Rainout would have reduced the amount reaching the stratosphere, but the rain’s chemistry hadn’t been measured. “No actual evidence was presented in this Science paper to show that any hydrogen chloride had really reached the stratosphere in this volcanic plume.”85 He then recounted evidence that the eruption of El Chichón in April 1982 had produced an increase of hydrogen chloride in the stratosphere of less than 10 percent, and that the June 1991 eruption of Pinatubo—a much larger eruption—had increased it even less. Yet hydrogen chloride levels had increased steadily between those two eruptions, despite the lack of any other explosive eruptions during the interceding nine years. This showed conclusively that the chlorine did not come from volcanoes.

Rowland traced the next phase of confusion over volcanic effects to Fred Singer’s 1989 National Review article. The confusion had been amplified by Ray’s attributing extremely high chlorine releases to Mt. Augustine.86 This had been taken as fact by people “who are relying, often unquestioningly, upon such fourth-hand descriptions of the volcano problem, rather than going back to the original literature.” Then the error had been broadcast far and wide by a variety of media outlets.87

Rowland’s attempt to correct these errors didn’t make a difference. In March 1994, Singer repeated the now-refuted claim that the evidence “sug-


63. Ibid.

64. Ibid.

65. Ibid.

66. Ibid.


70. Ibid. The discussion of Dobson is on p. 37; the quote regarding CFCs is on p. 38.

71. See Roan, Ozone Crisis, chap. 11.

72. Christie, The Ozone Layer, 46–47.


78. Ibid., 45.

79. Ibid., 175; see also Singer, Global Climate Change.


85. Ibid., 1574.


87. F. Sherwood Rowland, “President’s Lecture,” 1574.


90. Ibid., 54.


95. Data from Science and Environmental Policy Project IRS Form 990 for 2007 (lines 8d and 21), dated 15 May 2008.