'Evidence for global warming, ozone depletion is sparse and questionable'

by Dr. Dixy Lee Ray

Dr. Ray is a marine biologist, former chairman of the Atomic Energy Commission, and former governor of Washington State. Her book Trashing the Planet *was reviewed in the Nov. 16, 1990 issue of* EIR. *She delivered the following address, titled "Environmental Issues and Myths: Which to Believe?" to a meeting of the Jefferson Energy Foundation in Washington, D.C. on Oct. 15. Subheads have been added.*

If you assume from the title of my talk that I have a somewhat skeptical and irreverent attitude toward such popular environmental scenarios as "global warming" and "ozone depletion," you are correct. Yet it appears that nearly everyone believes that these are important problems from which the Earth must be saved! Why? Well, because everyone says so. But what of the evidence? What are the data that support these issues—and are there any contrary facts? This is what I will talk about.

First, global warming. The claim is that the Earth is warming up and that it is human activity, burning fossil fuels that increase the CO_2 content of the atmosphere, that is the cause. Moreover, the consequences of global heating are claimed to be disastrous, including changes in weather—rainfall, agricultural crops, sea level, etc.

Before examining the evidence, let us pause and look back to a similar set of claims made a decade and a half ago. Then the issue was not global warming, but global cooling!

Listen to what they said:

"An ice age, they said, would result in droughts, a shorter growing season, and worldwide hunger at first, and later in extensive glaciation. The deliberate melting of polar ice, strict pollution regulation, and the stockpiling of food were commonly proposed solutions to the crisis. . . .

"The cooling has already killed hundreds of thousands of people in poor nations. It has already made food and fuel more precious, thus increasing the price of everything we buy. If it continues, and no strong measures are taken to deal with it, the cooling will cause world famine, world chaos, and probably world war, and this could all come by the year 2000." (Lowell Ponte, *The Cooling,* 1976).

"The facts have emerged, in recent years and months, from research into past ice ages. They imply that the threat of a new ice age must now stand alongside nuclear war as a likely source of wholesale death and misery for mankind." (Nigel Calder, former editor of *New Scientists,* "In the Grip of New Ice Age," *International Wildlife,* July 1975.)

"There are ominous signs that the Earth's weather patterns have begun to change dramatically and that these changes may portend a drastic decline in food production—with serious political implications for just about every nation on Earth." (Peter Gwynne, *Newsweek,* April 28, 1975.)

"According to the academy [National Academy of Sciences] report on climate, we may be approaching the end of a major interglacial cycle, with the approach of a full-blown 10,000-year ice age of a real possibility . . . with ice packs building up relatively quickly from local snowfall that ceases to melt from winter to winter." (*Science,* March 1, 1975.)

"The continued rapid cooling of the Earth since World War II is also in accord with the increased global air pollution associated with industrialization, mechanization, urbanization, and an exploding population, added to a renewal of volcanic activity. . . ." (Reid Bryson, "Environmental Roulette, *Global Ecology: Readings toward a Rational Strategy for Man,* John P. Holdren and Paul R. Ehrlich, eds., 1971.)

"The sensitivity of climate was pointed up independently by a Soviet and an American scientist, who concluded that a permanent drop of only 1.6 to 2% in energy reaching the Earth 'would lead to an unstable condition in which continental snow cover would advance to the equator . . . [and] the oceans would eventually freeze,' according to a recent U.S. scientific advisory report." (Samuel W. Matthews, "What's Happening to Our Climate?" *National Geographic,* November 1976.)

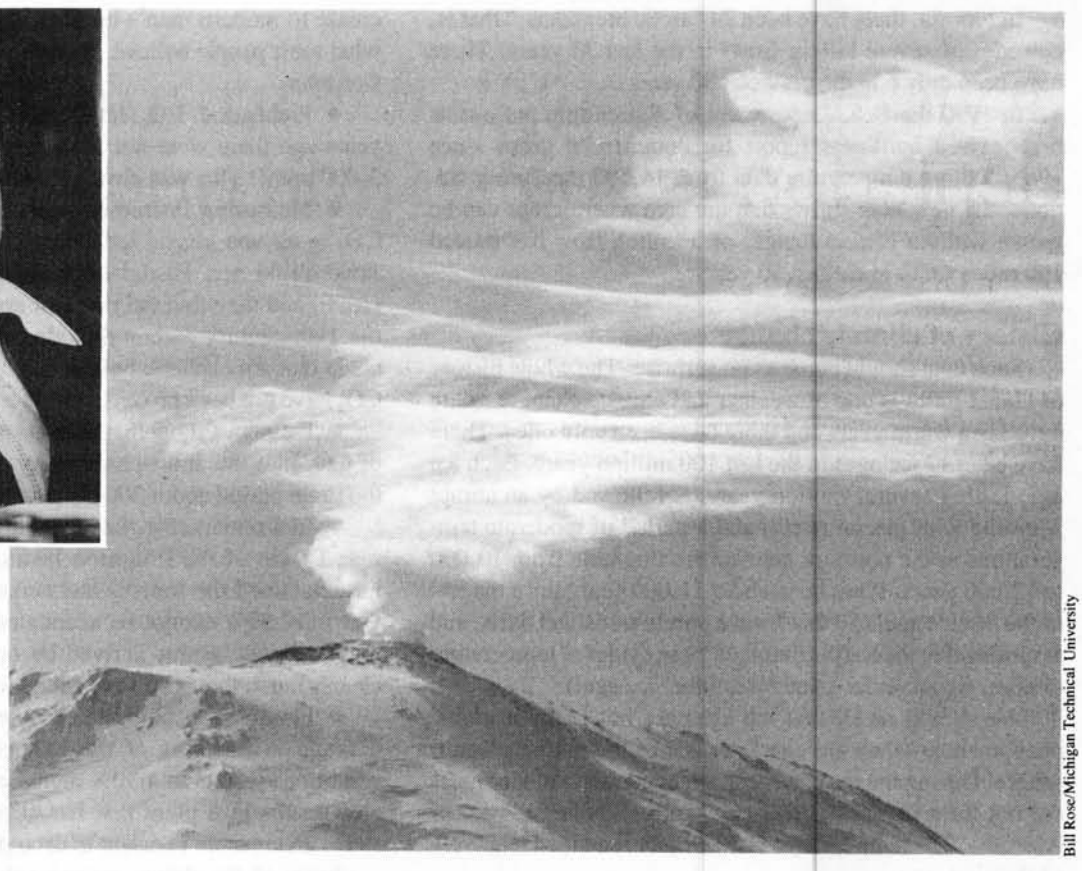
(All quotations were taken from "The Ice Age Cometh: Remembering the Scare of Global Cooling," by Anne J. Bray, *Policy Review,* Fall 1991, pp. 82-84.)

Global warming scare: déjà vu

How similar these warnings sound to what is being said today about global warming! Are our memories so short? Are they as serious and as frightening as the activists in these areas would have us believe? I think not. But let me explain why.

For more than 20 years, the American public has been subjected to a barrage of criticism about the way we live, about what we eat, about how we manufacture the materials that mark our incredibly productive society in the age of high

Westcott/Atomic Energy Commission



Bill Rose/Michigan Technical University

Mt. Erebus in Antarctica, only 10 kilometers upwind of the research station at McMurdo Sound, has been producing 1,000 tons of chloride each day for a century, and injecting it directly into the stratosphere. Inset: Dr. Dixy Lee Ray

technology, about how much and what kind of energy we use, and about how we handle the inevitable waste products of our activities.

Most recently we are told that we are destroying the Earth and its capacity to support life. These scoldings include predictions of catastrophe unless we make fundamental, unpleasant, and costly changes in the way we live. They have become a virtual litany of impending disaster. They have become a crusade to "Save the Planet." The charges are very serious; the question is, are they right? What *is* the evidence that supports them, and is there contrary evidence?

With respect to global warming there are two situations that are not in dispute:

First, the Earth and its atmosphere constitutes a "greenhouse"; our air is a porous blanket. If that were not the case, our planet would respond to the Sun's radiation the same as does the Moon whose temperature during the lunar day may reach +121°F and drop to −270°F during the lunar night. On Earth, roughly 30% of the incoming solar radiation is reflected back into space by the atmosphere, 20% is absorbed in the atmosphere, and 50% penetrates to the Earth's surface to cause warming. Of this latter, some fraction is reflected back as infrared radiation which in turn may be absorbed by certain constituents of air, the so-called "greenhouse gases." (Carbon dioxide, methane, hydrocarbons, and above all, water vapor.) Increase in the relative amount of any of these gases will, theoretically, result in elevated surface temperatures.

The theory is well established and well supported, by both theoretical and experimental evidence. There's only one problem—the theory doesn't appear to work in so simple a cause-and-effect manner in nature. If it did, the Earth would have warmed 2-4°C over the past 100 years. It has not. At best, there might have been about 0.5 °C increase in temperature, but that took place before 1940, and there has been about the same amount of cooling since then. Temperature records taken in the northern hemisphere over the past century show no upward trend. Further:

- Analysis of 135 years of surface ocean temperatures taken by ships at sea shows no upward trend (Prof. Reginald Newell, MIT).
- Analysis of 10 years (1978-88) of satellite measurements (TIROS II) taken continuously, day and night over land and sea shows no consistent change—up or down (published in *Science*).
- Analysis of certain plant species in the U.S.A. give an interesting picture: i.e.,

It used to be possible to grow citrus fruit in the southeast region of America as far north as the Carolinas. Now oranges will not ripen north of Orlando, Florida.

In Florida, there have been 24 "arctic breakouts," that is, episodes of severe killing frosts in the last 30 years. There have been only 6 in the previous 50 years.

In 1990 the U.S. Department of Agriculture put out its first revised hardiness report for commercial crops since 1965. Taking temperature data from 14,500 measuring stations, the new map shows that the area where crops can be grown without certain danger of a killing frost has moved 100 miles south in the last 50 years.

History of climate change

Such data should come as no surprise. The whole history of Planet Earth is one of weather and climate change. There have been warm years and there have been cold ones. There have been 17 ice ages in the last 100 million years. Each ice age, lasting several million years, is followed by an abrupt warming with glacial retreat and a period of moderate temperatures in the northern hemisphere that lasts from 10,000 to 12,000 years. It has been about 11,000 years since the end of the last ice age! (So that from a purely statistical basis, and assuming that the Earth continues these cycles of temperature change, we are indeed due for another ice age!)

We should recall that ice ages are not really a global phenomenon—they are characteristic of the northern hemisphere. During the ice ages past, great continental ice sheets did not form in South America, Africa, Southeast Asia, or Australia. The temperatures in the tropics remained relatively unchanged.

Moreover, during the current interglacial there have been significant climate shifts in the northern hemisphere. There are temperature oscillations of about 2,500 years in duration, with warmer periods centered about 1,000, 3,500 and 6,000 years ago and colder periods in between. Recall the medieval "little optimum (900 to 1100 A.D.). The Vikings sailed across an iceberg-free North Atlantic Ocean, settling Greenland and probably Labrador as well. This was followed by the "little ice age" (1430 to 1850). Cold was then so intense that trees froze and exploded from internal ice building in southern England, and the Thames River froze solid at London (1814). About 6,000 years ago the Sahara Desert was very different; cave paintings dating from that time show elephants, giraffes, crocodiles, and hippopotamus. Conclude: *data* do not support temperature rise. Claims based on computer projections cannot be accurate for the next five days; how can we expect them to be accurate in determining weather patterns for the next 50 years?

That brings us to the second situation: rise in the atmospheric concentration of CO_2.

So what do we know about CO_2? Quite a bit, including some little-discussed data. And yet, not enough. We know, with considerable certainty, that the CO_2 concentration in air has increased roughly 25% since the beginning of the industrial age—from 280 parts per million to 365 parts per million (0.035%). It is an easy conclusion to trace that increase to modern man's burning of fossil fuels—and that is what most people believe. But the situation is not so simple. Consider:

- Prehistoric CO_2 levels also changed—100 million years ago there were not 350 parts per million, but 3,000-5,000 ppm!! This was obviously not due to industry.
- Measuring instruments and techniques for detecting CO_2 in air and glacial ice have been critically reviewed by Jaworowski and Hisdal of the Norwegian Polar Institute (1990) and they find the range of error to approach 100% of the 19th-century carbon dioxide measurements. They conclude that atmospheric heating by anthropogenic releases of CO_2 have not been proved.
- Estimates show that humans pump about 7 billion tons of CO_2 into the atmosphere every year; nature produces in the same period about 200 billion tons of CO_2.
- In a remarkable, keenly analyzed paper (1990) Freeman Dyson of the Princeton Institute for Advanced Study has examined the sources and sinks for CO_2 and concludes that fully 50% cannot be accounted for. This corroborates previous conclusions derived by oceanographers. There is clearly much that is still not understood.
- Finally, we should remember that plants love carbon dioxide. A doubling of the CO_2 content under controlled conditions results in a 30% increase in growth and yield. It also results in a plant that has stronger, larger leaves and stems and is more resistant to drought and disease.

From all the above, we can only conclude that both the temperature regime and the CO_2 picture deserve greater study and understanding before trillions of dollars are spent to mitigate a problem that may not exist, or if it does, may not be very important.

Yet the supporters of the global warming theory are adamant. Here is what Dr. Stephen Schneider of the National Center for Atmospheric Research says:

"We need to get some broad-based support, to capture the public's imagination. That, of course, entails getting loads of media coverage. So we have to offer up scary scenarios, make simplified, dramatic statements, and make little mention of any doubts we may have. Each of us has to decide what is the right balance between being effective and being honest." (*Discover*, October 1989, p. 47.)

Now we must tackle the stratospheric ozone layer and its notorious "hole." What do we know for sure about this situation?

- The ozone layer is not stable; it is in a state of constant turbulence.
- Incoming radiation from the Sun—especially the UV spectrum—both creates and destroys ozone.
- Variations in the thickness of the ozone layer occur on a seasonal basis and vary according to latitude. Annual fluctuations are up to 25%.
- Greater thinning (up to about 50%) can occur at the South Pole. Thinning takes place at both poles but is greater

in the Antarctic.

- The so-called "hole" or thinning over the Antarctic appears annually at the end of the Antarctic winter; it lasts about 3-5 weeks and is then reconstituted. There is no permanent "hole."
- There is no overall loss of ozone.
- Polar thinning is related to the polar vortex—a cyclonic-type storm that forms each year in Antarctica at winter's end.
- Besides extreme cold (−85°C) for several weeks and return of the sunlight (and radiation), ozone "depletion" appears to require presence of the chloride ion.
- The belief persists that the chloride comes from the CFCs (chlorofluorocarbons)—mainly freons, but there is no documented proof of this—only theory.
- Chloride is one of nature's most abundant ions, with major sources in volcanic eruptions and oceanic storms.

Consider the following:

- The world production of chlorofluorocarbons is 1.1 million tons per year. This accounts for roughly 750,000 tons of chloride.
- Evaporation of sea water provides the atmosphere with 600 million tons of chloride per year.
- Passive outgassing from the Earth accounts for 36 million tons of chloride per year.
- Volcanic eruptions emit a few million to hundreds of millions of tons of chloride. Tambora erupted in 1813 with 211 million tons of chloride—at the present rate of production of CFCs, it would take humans about 282 years to produce as much chloride as this one eruption.
- We are living in a period of greatly increased volcanism; Mt. Erebus produces 1,000 tons of chloride daily and has been doing so for a 100 years. It is located in Antarctica, 10 kilometers upwind of McMurdo Sound and injects its chlorides directly into the stratosphere.
- Again, how much chloride comes from CFCs? About 0.75 million tons annually. Yet the amount of chloride calculated to be in the stratosphere at any one time is 50 to 60 times this figure.

If indeed chloride is necessary to the stratospheric breakdown of ozone, whose chloride is it, man or nature's?! There is no documented evidence of CFC molecules in the stratosphere. There are no measurement data, only theory. We can hope that the recently launched instruments to measure the composition of the ozone layer will remedy this.

'Ozone hole' occurs naturally

Recall that the so-called "ozone hole" was discovered in 1956 by the Cambridge meteorologist Gordon Dobson. It was Dobson who devised the instrumentation and techniques of measuring the stratospheric ozone. He considered the Antarctic ozone thinning to be an anomaly until the phenomenon occurred again in 1957 when he reported it as a natural annual event. The French investigators P. Rigabe and B. LeRoy also measured the "hole" in 1958 when it was thinner than at any time since—and this was 30 years ago, before the widespread use of CFCs. Their conclusion was briefly stated:

> "[T]he thinning [is] related to the polar vortex . . . and the recovery is sharp and complete." French scientists also related the ozone "depletion" to increased solar activity; "we are now living in a period of greater solar flares and sunspots than at any time since Galileo's day."

Concern about the loss of stratospheric ozone relates to penetration of ultraviolet (UV) radiation. The thinner the ozone shield, the greater UV penetration to the earth's surface. But, measuring instruments set up in the U.S. in 1974 show *no* increase in surface UV radiation. Moreover, it should not be forgotten that all people, and especially light-skinned ones, require some direct exposure to sunlight (UV) to prevent the development of rickets and/or later onset of osteoporosis or other bone-thinning maladies.

Of course, overexposure to UV radiation can cause skin cancer, this is well established. But people have been unduly frightened by not being told that there are two differnt kinds of skin cancer. One, related to too much ultraviolet (or sunbathing or tanning salons) is unsightly, irritating and annoying, but curable in 99% of the cases. The other, more rare form is malignant melanoma. This cannot be correlated with exposure to UV, is usually fatal, and appears to be genetically determined. To imply that ozone loss (even if it occurred) would lead to an increase in malignant melanoma is a false and malicious misuse of science.

On April 4, 1991, William Reilly, the administrator of the U.S. Environmental Protection Agency, said, "The ozone has thinned 4-6%, which doubles the previous estimate. This means 200,000 more cancer deaths over the next 50 years."

He called the situation "grim." His statement is wrong, both as the purported thinning and the skin cancers. Even if he were right, a 4-5% increase in exposure to UV is far less than a simple shift to a lower latitude. Moving from Washington, D.C. to south Florida increases one's UV exposure about 22%, and a journey from either pole to the equator subjects a person to a natural increase in UV radiation of 5,000%!

Finally, those who would ban the production and use of CFCs on the basis of computer simulations and undocumented theory, choose to overlook the reasons why chlorofluorocarbons were developed and put into use in the first place. They are nonvolatile, nontoxic, and present no direct hazards to living organisms. CFCs are used in refrigeration and air-conditioning equipment, in fire-fighting (halon foams), and in degreasing and cleaning electronic components. Despite many promises to the contrary, no substitutes have been developed and put into production. All of the proposed substitutes have turned out to be toxic, flammable, corrosive,

and inefficient. Use of any of them, or return to cumbersome, ineffective refrigerants like ammonia or sulfur dioxide would require total redesign of equipment. In the U.S. alone there are 5,000 companies that use CFCs; the value of the goods they produce is $28 billion per year. There are millions of individual and commercial refrigerating and air-conditioning units. The capital investment exceeds $150 billion. The entire food transportation and marketing system throughout the western world depends upon refrigeration. Is it sensible to throw all this away on the flimsy evidence so far offered as a reason to ban CFCs? Why not simply seal the units better and recycle the freon?

In conclusion, careful scrutiny of the evidence shows that supporting data for both global warming and ozone depletion is sparse and questionable. Yet the U.S. has already entered into an international agreement to ban the production of CFCs—and the cost of freon has already gone up 30%. Dr. Richard Benedick, who negotiated the CFC ban on behalf of the U.S. has acknowledged that this action sounded the "death knell" for an important part of the chemical industry. Yet he insists the ban was necessary even though the scientific basis for it has not been established. I believe that we are entitled to ask "Why?" The costs are enormous, yet they pale by comparison with the financial burden put upon the American people if the 'ming" advocates prevail. And the United States is now preparing its position for an International Conference on Global Climate to take place in Brazil in June of 1992. The conference will propose to reduce the emissions of carbon dioxide to 1988 levels and to bring about a further 25% reduction by the year 2000. This cannot be accomplished without serious curtailment of industry and without severe reduction in our standard of living. Estimates place the cost at more than $3 trillion. Does our firm knowledge of the problem and its possible consequences justify such a sacrifice?

My answer is *no*.

Remember, too, that our very liberty depends upon a strong and vigorous economy. Destroy that economy and we will also destroy our liberty. Consider the following quotation:

> When one is deprived of one's liberty, one is right in blaming not so much the man who puts on the fetters as the one who had the power to prevent him, but did not use it. Why are we still considering whether we have enemies instead of how we can resist them?

Who said this? It was the Corinthian emissaries to Sparta in the year 432 B.C.—but it is still applicable today.

We still have to fight for what we believe.