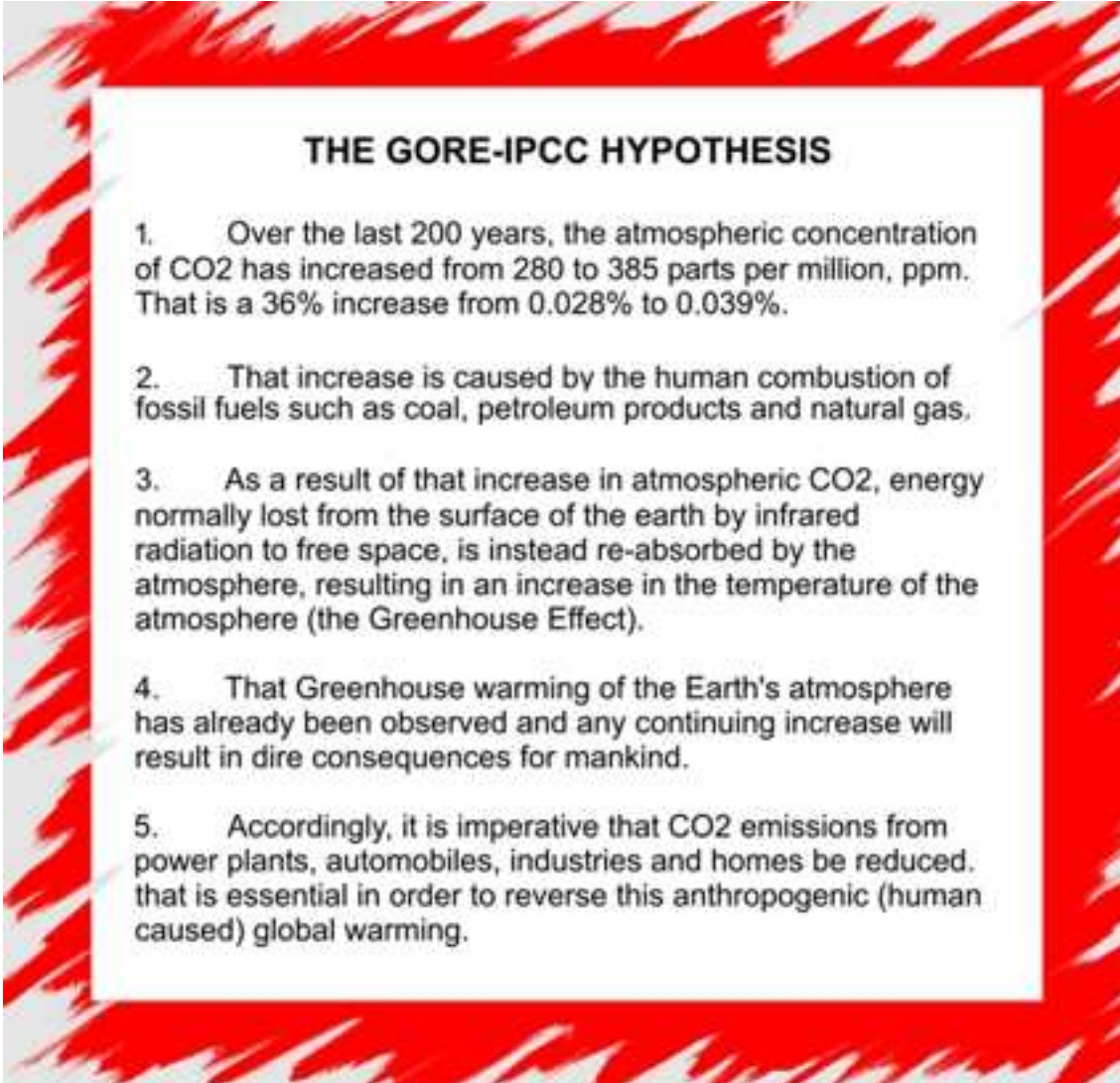


# The Lynching of Carbon Dioxide - The Innocent Source of Life

by Dr. Martin Hertzberg

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**Al Gore** and the International Panel for Climate Change (the **IPCC**) have for years presented the public with this argument:



**THE GORE-IPCC HYPOTHESIS**

1. Over the last 200 years, the atmospheric concentration of CO<sub>2</sub> has increased from 280 to 385 parts per million, ppm. That is a 36% increase from 0.028% to 0.039%.
2. That increase is caused by the human combustion of fossil fuels such as coal, petroleum products and natural gas.
3. As a result of that increase in atmospheric CO<sub>2</sub>, energy normally lost from the surface of the earth by infrared radiation to free space, is instead re-absorbed by the atmosphere, resulting in an increase in the temperature of the atmosphere (the Greenhouse Effect).
4. That Greenhouse warming of the Earth's atmosphere has already been observed and any continuing increase will result in dire consequences for mankind.
5. Accordingly, it is imperative that CO<sub>2</sub> emissions from power plants, automobiles, industries and homes be reduced. that is essential in order to reverse this anthropogenic (human caused) global warming.

Now Al Gore, the IPCC, and the vast majority of politicians in the US and Europe argue that this is all established science. But I am here to show that not only is this not established science, but that the objective evidence available indicates that it is false.

Shocking isn't it? You might ask, how can a lifelong Democrat like myself reject my party's position on global warming and join the camp of the skeptics, virtually all of whom are Republicans or neo-cons.

So, I'll tell you how it all started for me.

My involvement in this issue of global warming started in 1986 at a NATO-sponsored meeting on coal combustion that was held in the French Alps. A colleague from MIT, actually solicited my opinion on the subject of global warming.

Now, just being asked for an opinion by someone from MIT is a great honor. I had given a paper at a Combustion Symposium at MIT in which I had used the infrared emissions from CO<sub>2</sub> to measure explosion temperatures, so I was familiar with its spectrum, and he knew that I had once been a meteorologist, so he solicited my opinion.

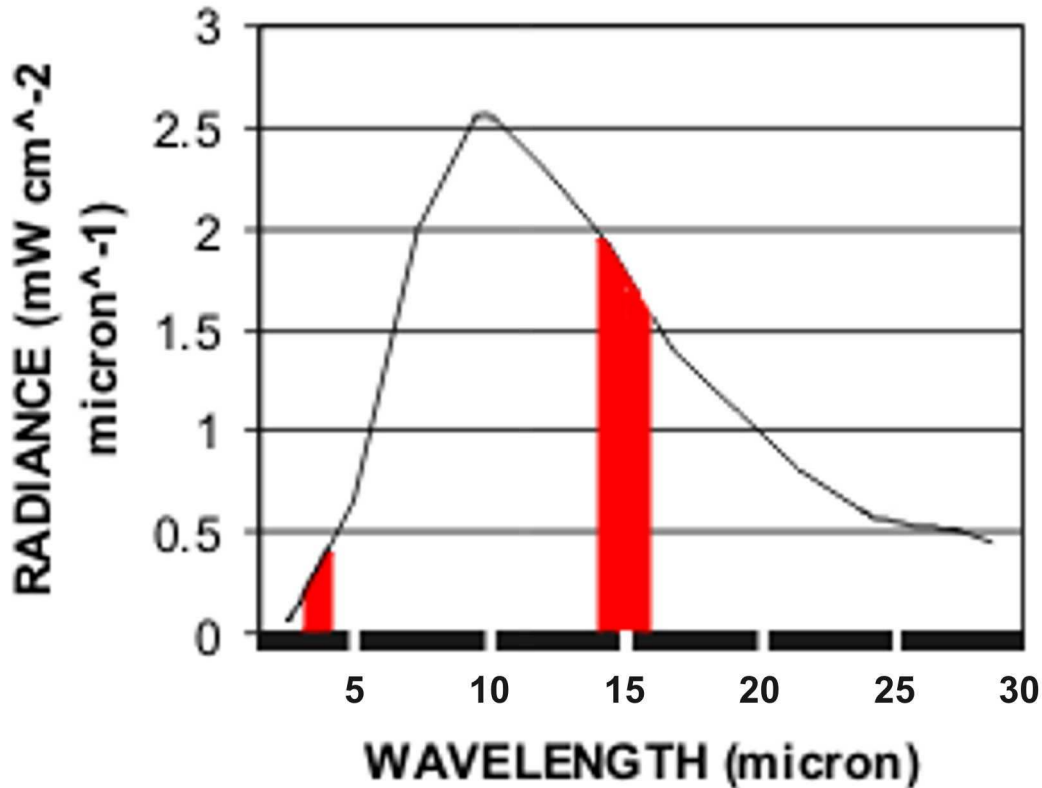
Shortly thereafter, a colleague from New Zealand, who had worked in our lab while on his sabbatical, wrote to me about the subject, and we proceeded to collaborate on a study of the problem.

We confined our attention to item 3 of the Gore-IPCC argument which dealt with the infrared absorption of atmospheric CO<sub>2</sub> and the atmospheric heating that would result. In 1994, I presented our paper at a Symposium in Irvine, California.

Let us look at the atmospheric absorption spectrum of CO<sub>2</sub>.

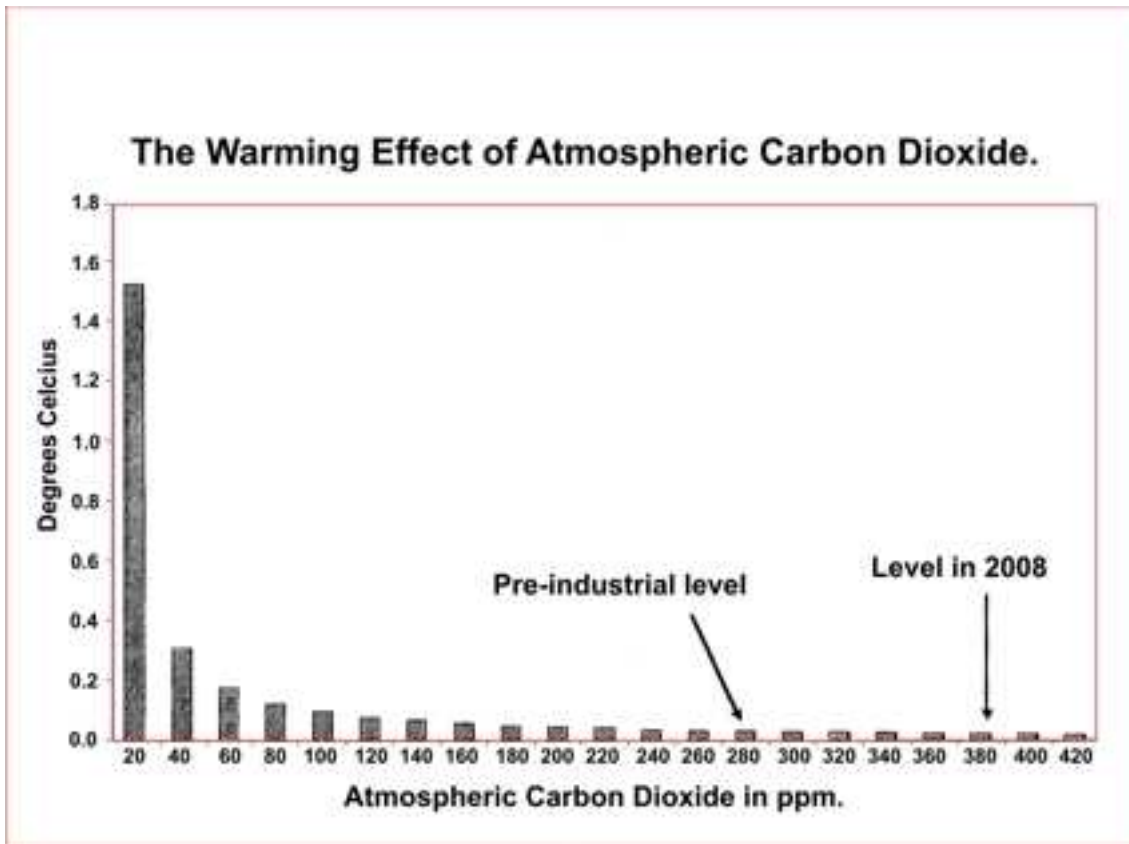
## ATMOSPHERIC CO<sub>2</sub> ABSORPTION

■ Main bands



This plot shows the approximate spectrum of the infrared heat radiated to free space from the surface of the earth at the earth's average temperature. It represents the maximum possible heat loss that would balance the heat gained from the sun. Plotted on the graph are the narrow absorption bands of atmospheric CO<sub>2</sub> that would represent its "greenhouse effect". They are at 4.3 and 15 microns. I used the 4.3 micron band for my measurements of gas temperatures. The bands are narrow and confined and at most they can absorb only a few percent of the total energy under this curve.

The situation is further clarified in this next figure, where we show the effect of increasing the concentration of CO<sub>2</sub> on atmospheric heating.

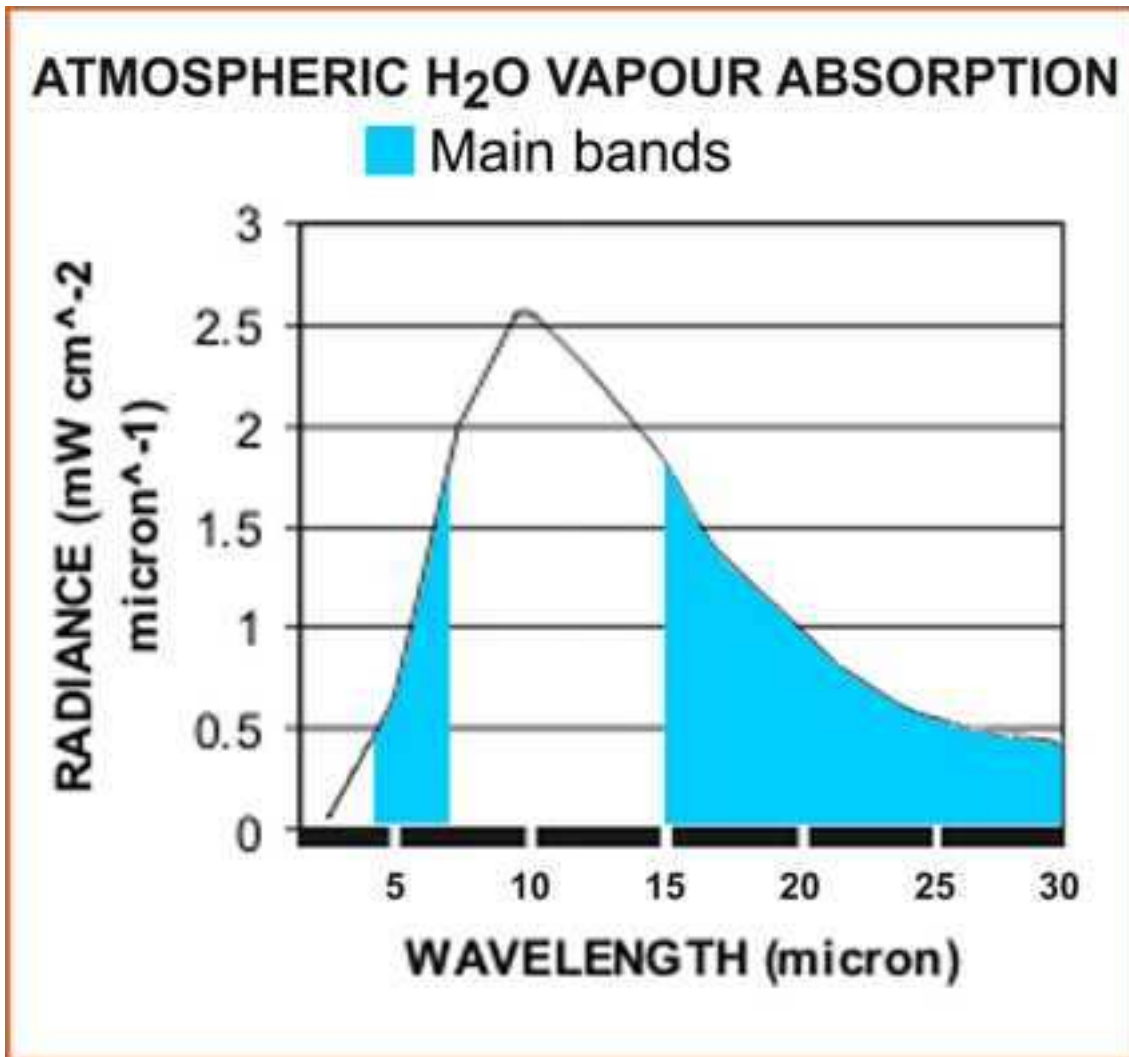


The first 20 ppm of CO<sub>2</sub> essentially makes the atmosphere almost opaque at those previously shown wave lengths, so that doubling the concentration to 40 ppm increases the heating effect by only 20 % more. Doubling it again to 80 ppm increases the heating effect by only 7 %.

As you can see, increasing the concentration further diminishes the heating effect, so that by the time we get to the last century's increase from 280 to 380 ppm, the effect is utterly trivial. It is as though you had blackened a glass window with one coat of paint so that it was 99 % opaque. Adding a second coat increases its opacity by only 1 % more, but it is now completely opaque. Adding a third coat, has no visible effect at all.

Even more significant is the effect of water vapor in the atmosphere, which for a tropical atmosphere can be as high as 20,000 parts per million. Its absorption bands in the infrared are far

more significant than those of CO<sub>2</sub>. They are shown here and they absorb an order of magnitude more than can be absorbed by CO<sub>2</sub>.



In addition, water in the form of cloud droplets covers on the average about 30 % of the earth's atmosphere, so that clouds will keep about 30 % of this central radiance from being lost to free space.

After looking at such data and evaluating it, the conclusion of our 1994 paper was (and I quote):

***“ The problem of obtaining a reliable value for the absorptivity to emissivity ratio for all the entities at the earth’s surface and in its atmosphere that participate in the radiative equilibrium process is a formidable task. It is unlikely that any proposed model contains a realist ratio for the entire globe over a long enough time scale....***

***“ It is implausible to expect that small changes in the concentration of any minor atmospheric constituent such as carbon dioxide, can significantly influence that radiative balance, despite the fact that carbon dioxide plays a major role in the biosphere. The most significant atmospheric component in the radiative balance is water: as a homogeneous absorbing and emitting vapor, in its heat transport by evaporation and condensation; as clouds, snow and ice cover, which have a major effect on the albedo, and as the enormous circulating mass of liquid ocean, whose heat capacity and mass/energy transport with the atmosphere dominate the earth’s weather.” (end quote)***

In the 14 years since that conclusion was drawn, all the data I have seen only further reinforces that conclusion. So much so, that I currently dramatize that conclusion on the subject by saying:

***“ In comparison to water in all of its forms, the effect of the carbon dioxide increase over the last century on the temperature of the earth is about as significant as a few farts in a hurricane!”***

In the intervening years, as the fear mongering hysteria on the subject of human caused global warming grew, and as Gore was able to negotiate the Kyoto protocol on the subject, I felt compelled to get my analysis published more widely. I wrote to Bert Bolin, the Swedish oceanographer, who headed the IPCC, and submitted the paper to Nature and Science, but despite the fact that I had published about 100 research papers by then, including a Navy manual on the use of computer models to forecast weather, they wouldn’t publish my analysis. Who was I to challenge all those sophisticated computer models that were predicting catastrophic

warming as a result of human emissions of CO<sub>2</sub>? Never mind that none of them had ever been verified, and besides I was challenging the results of an industry that was being supported by billions of dollars of research contracts and grants. Now since that 1994 paper, I have had the opportunity to study the data dealing with some of the other steps in this indictment of Carbon Dioxide, the Earth's innocent source of life, the essential ingredient of photosynthesis on which virtually all life on earth depends. We have dealt with step 3 of the Gore-IPCC table; now we shall move to consider step 2.

### THE GORE-IPCC HYPOTHESIS

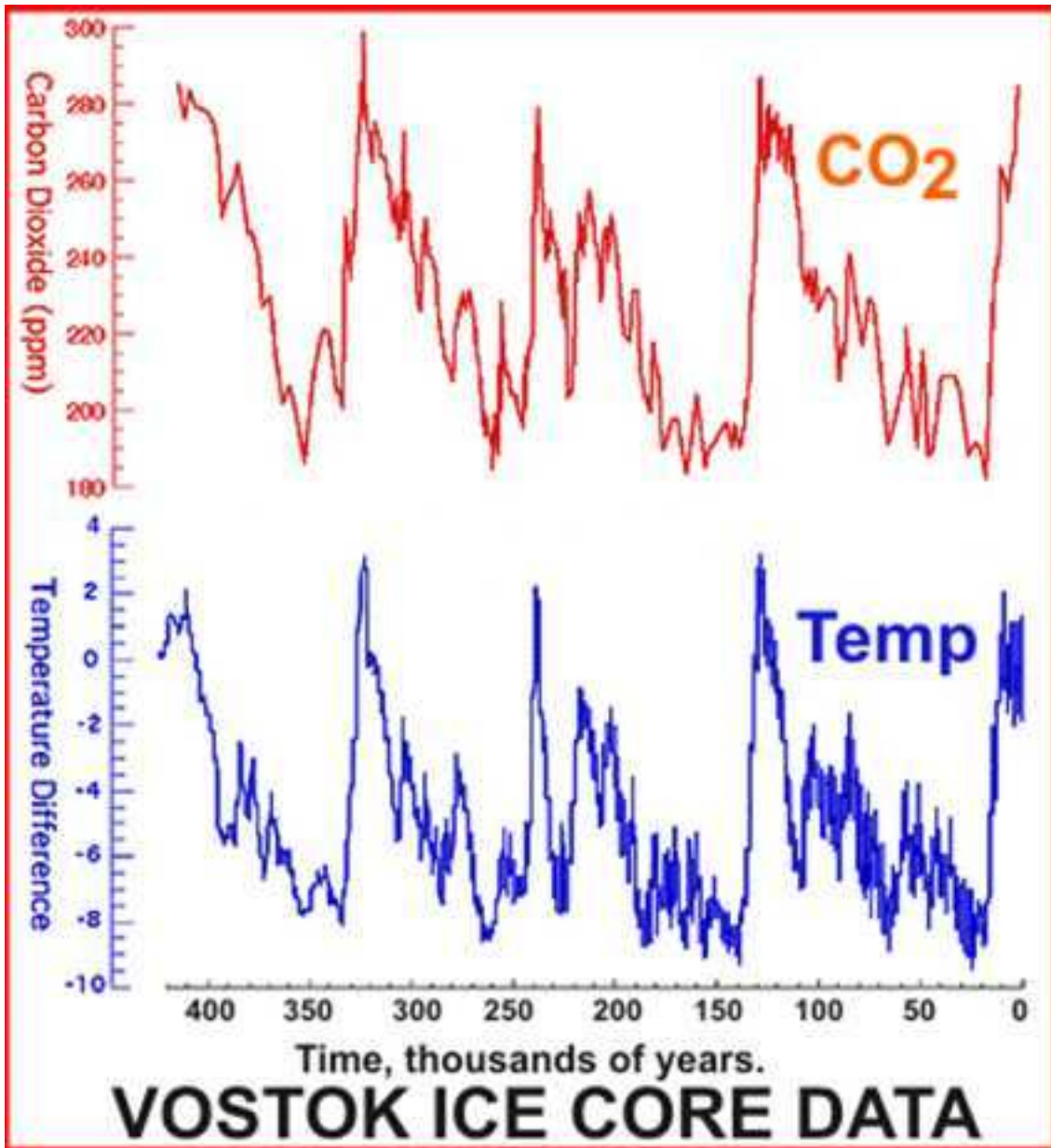
1. Over the last 200 years, the atmospheric concentration of CO<sub>2</sub> has increased from 280 to 385 parts per million, ppm. That is a 36% increase from 0.028% to 0.039%.
2. That increase is caused by the human combustion of fossil fuels such as coal, petroleum products and natural gas.
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Step 2 claims that the observed increase was caused by the human combustion of fossil fuel, step 4 argues that that anthropogenic increase represents a serious danger for mankind, and step 5 indicates that it is imperative that human emissions be reduced.

I will present some of the data that contradicts this Gore - IPCC hypothesis.

Also, several years ago, by pure chance, I met Alexander Cockburn, a columnist for the Nation magazine on a Nation cruise, and sensed that he too was a global warming skeptic. I sent him copies of my paper, my several letters to the editor, and other correspondence. Last year he wrote a series of columns based in part on my work. Copies of that series of columns are available for you to take with you. Politically, Cockburn is well to the left of me, and he has received lots of vituperative criticism from environmentalists and others for his articles. I myself have been accused of being a tool of the coal barons, which would come as a great surprise to them, since I spent most of my career advocating for more stringent safety regulations in their mines. So let's look at some more data, as shown here –





Here is the Vostok ice core data for the last 420,000 years. Gore showed this curve in his movie and in his book, "An Inconvenient Truth". The red line shows the atmospheric CO<sub>2</sub>, and the blue line is the temperature relative to recent values.

The data show a remarkably good correlation in the long term variations in temperature and CO<sub>2</sub>. There are four Ice Ages shown with average temperatures some 6 to 8 C below current values. Those ice ages are characterized by CO<sub>2</sub> concentrations as low as 170 - 190 ppm.

Five Interglacial Warming periods are shown with temperatures some 2 to 4 C above current values. They are characterized by CO<sub>2</sub> concentrations as high as 270 to 300 ppm.

The last warming period shown is the current one that started after the last ice age ended some 20,000 years ago. Gore uses this data to argue that this proves that high CO<sub>2</sub> causes global warming, and that the current levels at 385 ppm are higher than any over the past 420,000 years. And that's all you read about in newspaper headlines.

Is that an objective evaluation of this data? Let's look at what Gore failed to mention. First, this correlation has been going on for about half a million years, long before any significant human production of CO<sub>2</sub> which began only two hundred years ago.

Two hundred years is a bare pencil width on this time scale. Thus, it can be argued that the current overall increase in both CO<sub>2</sub> and temperature are merely the continuation of a natural process that has nothing whatever to do with human activity.

What he also fails to mention is data from the Eocene period some 20 to 30 million years before humans even appeared on the earth. In the Eocene, high latitudes were ice free, some 10 C warmer than they are today, and CO<sub>2</sub> concentrations were over 1,500 ppm, some 400 % higher than they are today.

But Gore's most egregious error is his contention that these high CO<sub>2</sub> values actually caused the temperature rises.

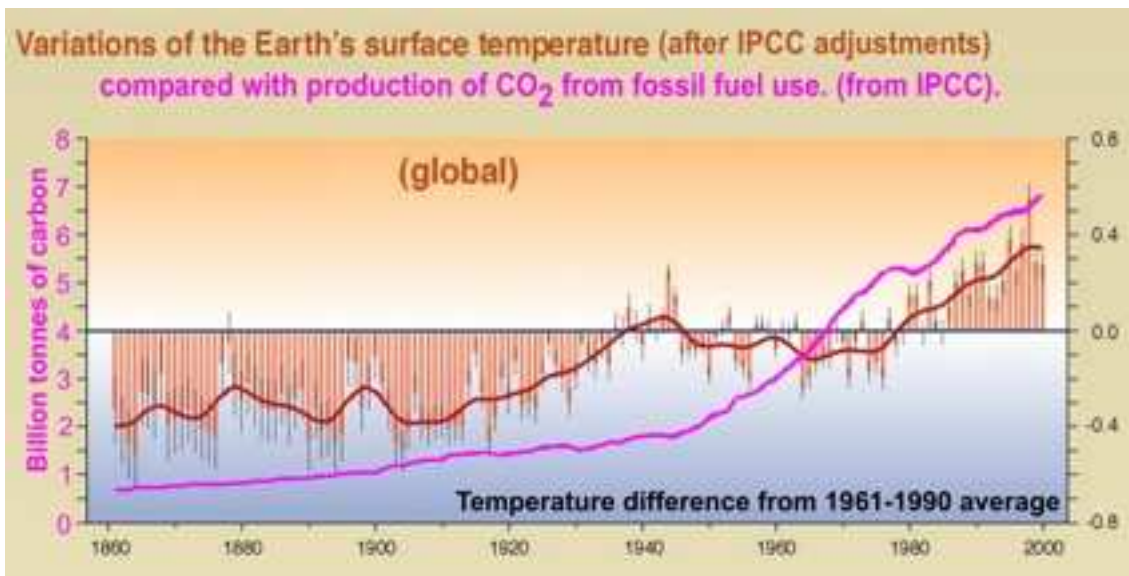
What he knows but fails to mention is that these same data show that the changes in temperature always precede the changes in CO<sub>2</sub> by about a thousand years.

The temperature increases or decreases come first, and it is after that that the CO<sub>2</sub> follows. Any objective scientist looking at that result would conclude that it is the warming that is causing the CO<sub>2</sub> increase, not the other way around as Gore claims.

Gore also neglects to ask the most logical question: where did all that CO<sub>2</sub> come from during those warming periods when the human production of CO<sub>2</sub> was essentially zero? The answer is that it came from the same place that the current increase is coming from: from the oceans. The amount of CO<sub>2</sub> dissolved in the Earth's oceans is at least 50 to 100 times greater than the amount in the atmosphere. As oceans warm for whatever reason, some of their dissolved CO<sub>2</sub> is emitted into the atmosphere, just as your soda pop goes flat and loses its dissolved CO<sub>2</sub> as it warms to room temperature. As oceans cool, CO<sub>2</sub> from the atmosphere dissolves back into the oceans, just as soda pop is manufactured by injecting CO<sub>2</sub> into cold water.

That explains not only the CO<sub>2</sub> variations in this data for the 420 thousand years before any human production of CO<sub>2</sub>, but also the much larger CO<sub>2</sub> increases that occurred some 20 - 30 million years before humans even appeared on the earth.

So Gore and the IPCC have it back asswards: it is the warming of the earth that is causing the increase in CO<sub>2</sub>, not the other way around as they claim. Let us look at some more data on the question of whether the current modest increase in the average temperature of the Earth is caused by the human production of CO<sub>2</sub>. The data for the recent decades is shown here:

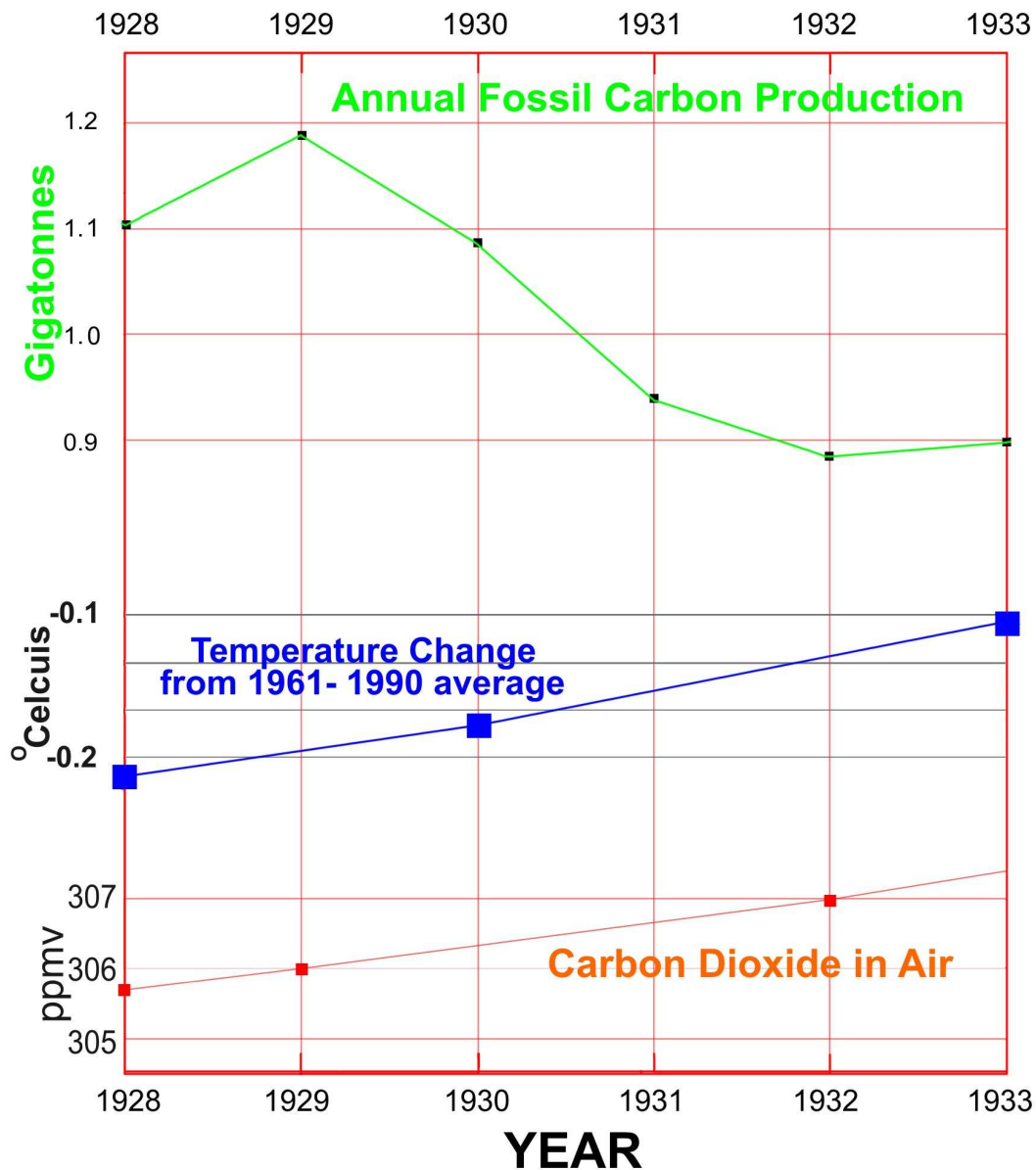


This is the IPCC data for temperature changes shown in red with the scale on the right. The orange line shows the overall temperature trends. It is compared with the human production of CO<sub>2</sub> from fossil fuels, shown in purple with the scale on the left. The overall increase in both quantities over the last century or so does not prove a causal relationship.

After all, lots of things have increased over the same period: the average height of buildings, the population of San Diego, the production of corn, the cost of living, and none of those is causally related to atmospheric temperature. The devil is in the details, for if we look at the period from 1940 to 1970, the average temperature of the earth dropped some 0.25 C at a time when the human production of fossil fuels tripled. I remember that period of the 1960's when we were warned that another ice-age was coming. Those warnings came from some of the same people who are now pushing the global warming scare. The rate of increase of temperature from 1910 to 1940 was about the same as from 1970 to 2000, yet the fossil production then was five times smaller than it is today.

One of the more dramatic contradictions to the Gore-IPCC hypothesis is one that I came up with myself, and which appealed to Cockburn and to an Australian group of fellow skeptics. Let's assume for the moment that Gore-IPCC are right; namely that the human production is dangerous and that we must reduce human production of CO<sub>2</sub>. So let's do it! Guess what? We've been there and done that, and we didn't need the Kyoto protocol to do it. We reduced the world wide production of fossil carbon dioxide by a whopping 30% starting one year before I was born. Here's the data:

## SOME CHANGES IN GREAT DEPRESSION



This is what actually happened during the years of the Great Depression. In 1929, production was at 1.17 Gigatons of carbon burned per year. Then the stock markets crashed, the depression hit, and human generation fell to 0.88 Gigatons per year.

What did the atmospheric CO<sub>2</sub> and temperature data show during those three years? As you can see from the lower curves, they

didn't skip a beat in their relentless rise at their normal rate. So a 30 % decline in fossil carbon dioxide emission has absolutely no effect on temperature or atmospheric CO<sub>2</sub>. Why? Again because the increase in CO<sub>2</sub> is coming from somewhere else: namely, the oceans, and the temperature is unrelated to human activity.

I don't have time now to go into all the details, but our best estimate of the human contribution of CO<sub>2</sub> to the atmosphere is that it trivial compared to the total amount generated naturally from respiration, the decay of vegetation, naturally occurring fires, volcanic eruptions, and the weathering of carbonate rock. Incidentally, when I indicated that the amount of CO<sub>2</sub> dissolved in the ocean was about 50 to 100 times greater than the amount in the atmosphere, I neglected to mention that the amount of CO<sub>2</sub> in carbonate rock in the earth's crust contains about 2000 times more than the amount dissolved in the ocean.

So far in my criticism of the Gore-IPCC hypothesis, we were dealing with lack of objectivity, or failure to ask the important questions. I will end this talk with two examples that go beyond that, and which border on fabrication.

The global warming advocates including the IPCC argue that the CO<sub>2</sub> we emit into the atmosphere lasts for centuries. Some even claim that it accumulates for thousands of years. Like unabsolved sins, they claim that our transgressions will pile up until the earth gets so hot that it burns up creating the hell we deserve.

The most authoritative study of the lifetime of CO<sub>2</sub> in the atmosphere was done by a Norwegian, Professor Tom Segalstad of the University of Oslo. The measured lifetime, based on the studies of some 50 independent researchers is at most about 5 years.

The best measurements came from the rate of decay of the radioactive isotope of Carbon, Carbon 14 which was injected into the atmosphere during past, above-ground nuclear weapons tests. It is an unambiguous and accurate measurement. You just measure its decay in the atmosphere as a function of time. Segalstad concludes that the short lifetime means that CO<sub>2</sub> is quickly taken out of the

atmosphere and recycled into the oceans. Despite such authoritative measurement, the global warming advocates still maintain that CO2 accumulates in the atmosphere for hundreds of years.

I will quote from Professor Segalstad's recent e-mail to me:

***“ It is incredible that this wild idea of CO2 being an evil gas in the atmosphere has paralyzed most of the world today, especially since it is the “gas of life” responsible for photosynthesis that makes the food we eat. Daily we see the news media presenting apocalyptic views, not backed by solid measurements or comprehensive scientific theory. When we try to correct them, our contributions are usually rejected.....Editorial committees in scientific journals are now IPCC-supporting people, not allowing critics to appear in print. A manuscript submitted by me to Nature was rejected with only one sentence: '30 years of greenhouse effect research cannot be wrong'. I was tempted to tell the editor that he should terminate his publication altogether. After all if everything they published in the last 30 years was correct, who needs any more research.”***

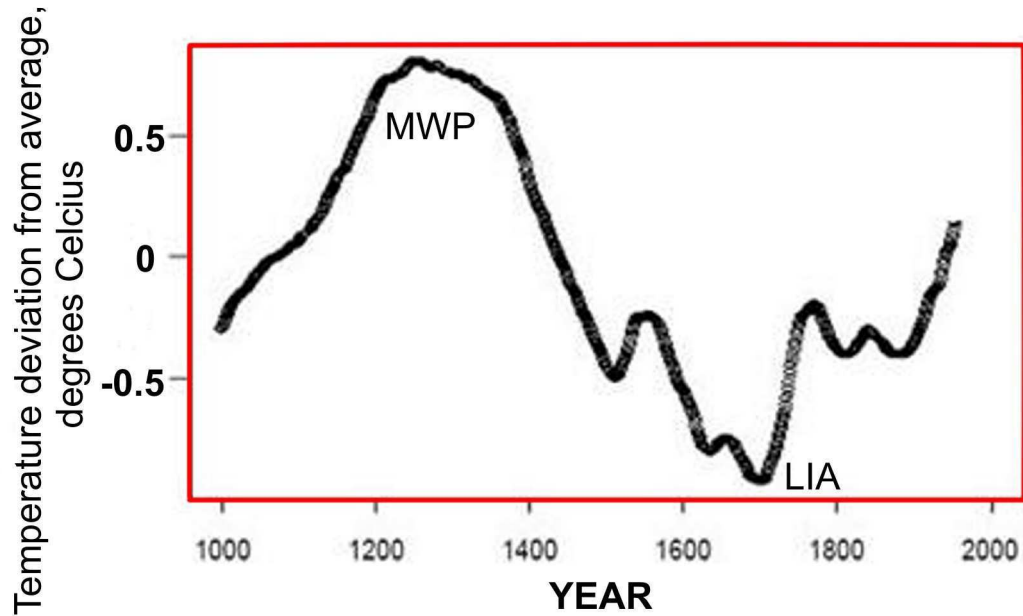
Too bad the small committee of the Norwegian parliament that awarded Gore and the IPCC the Nobel Peace Prize didn't have enough sense to consult with Prof Segalstad before they made their ghastly mistake. He was only a short distance away and he knew more about the subject than anyone of them.

But as you can see, Prof. Segalstad's experience in getting his work published is similar to mine.

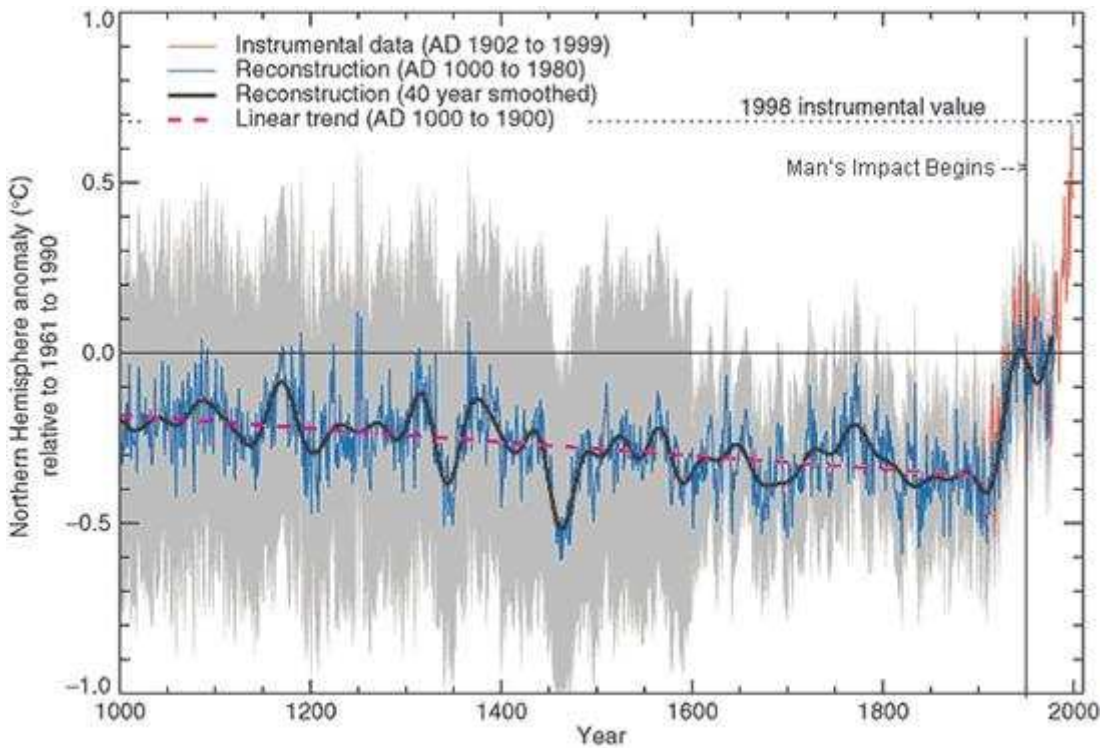
My final example is one of egregious fabrication. It is the infamous story of the hockey stick curve, as depicted here:

Now, the Hockey stick:

# ACCEPTED EARLY GLOBAL TEMPERATURE RECONSTRUCTION.



Source: IPCC 1990. Since adjusted.



In their 1990 report the IPCC published the upper graph, of



how global climate had changed over the past 1000 years. It shows the Medieval Warm Period from 1000 to 1400 AD, and the Little Ice Age from about 1400 until 1880 AD. Those periods were well established in European history: for example, the Viking colonization of Greenland during the Medieval Warm Period, and those settlements collapsed during the Little Ice Age, when even the Thames in London froze over. Like the Vostok data, this curve presented a serious problem for the global warmers: the Medieval period was warmer than today with no significant human emission of CO<sub>2</sub>, so what's so unusual about the current warming trend? The problem was solved for the global warmers by an obscure 1999 paper which used tree ring data to assess past temperatures.

Tree ring data are not a particularly reliable temperature proxies because tree rings are also influenced by other factors such as rainfall, sunlight, cloudiness, pests, competition from other trees, soil nutrients, frost and snow duration. Nevertheless, that tree ring curve is shown in the lower figure. As can be seen, it has the shape of a hockey stick.

Within a matter of months this hockey stick curve was accepted by the IPCC. Never mind that trees only grow on land and that 71 % of the earth is covered by water and thus have no trees. Never mind that the data were only from the Northern Hemisphere, but soon thereafter in a U. S. National Assessment, it became the global temperature curve. The coup was "total, bloodless, and swift and the hockey stick was greeted with a chorus of approval from the greenhouse industry."

Suddenly, the Medieval Warm Period and the little Ice Age became non events, consigned to a kind of Orwellian 'memory hole'. The global warmers argued that if those events had existed at all, they were strictly local, European phenomena.

The tree ring results were trumpeted in the media:  
***"New studies indicate that temperatures in recent decades are higher than at any time in the past 1000 years.....with the 1990's as the warmest decade and 1998 as the warmest year"***.

Many knowledgeable climatologists and others questioned those results, and asked for copies of the original data to check the analysis. The authors of the hockey stick report resisted, and only grudgingly yielded, so it took years to get the data and the complex computer program used to analyze the tree ring data.

An independent committee of statisticians was finally appointed to evaluate the tree ring results. They concluded that the authors had 'misused certain statistical methods in their studies, which inappropriately produced hockey stick shapes in the temperature history'. They also concluded that the claim that the decade of the 1990's was the hottest decade in the millennium and that 1998 was the hottest year in that millennium, could not be supported by the original data.

So how did the latest IPCC report of last year handle this issue? Did they make the appropriate correction and retract their previous assessment. Absolutely not. They simply never mention it, putting the whole issue into the same "memory hole" that they had earlier placed the Medieval Warm Period and the Little Ice age.

In recent years, climatologists have spread out all over the globe and found clear records of both the Medieval Warm period and the Little Ice Age in the following locations: the Sargasso Sea, West Africa, Kenya, Peru, Japan, Tasmania, South Africa, Idaho, Argentina, and California.

Here is the conclusion of a very distinguished, recently deceased, Australian climatologist, about this hockey-stick fiasco:

***"The evidence is overwhelming, from all corners of the world, the Medieval Warm Period and the Little Ice Age clearly show up in a variety of proxy indicators, proxies more representative of temperature than the inadequate tree ring data.***

***"What is disquieting about the hockey stick is not its original publication. As with any paper, it would sink into oblivion if found to be flawed. Rather it was the reaction of the greenhouse industry to it - the chorus of approval, the complete***

***lack of critical evaluation of the theory, the blind acceptance of evidence that was so flimsy. The industry embraced the theory for one reason and one reason only - it told them exactly what they wanted to hear.”***

Sound familiar? Remember the Iraqi defector code-named ‘curveball’ and his stories about all the weapons of mass destruction in Iraq?

What I have presented so far is just a small fraction of all the data available that directly contradicts the Gore - IPCC arguments. If we pursue the folly of carbon sequestration or carbon credit trading, we will be wasting hundreds of billions of dollars and it will have no effect at all, just as the 30 % reduction in fossil production during the great depression had no effect at all. The earth’s oceans and the photosynthesis process are much more effective in the sequestration of CO<sub>2</sub> than anything we can do artificially. Wasting hundreds of billions of dollars chasing this phantom of global warming won’t be as wasteful as our idiotic war in Iraq, but it is still real money, and it will have no effect at all.

There are real environmental problems caused by human activity: acid rain, acid mine drainage, heavy metal pollution from that drainage, deforestation, carcinogenic particulates in diesel exhaust, mercury pollution from power plants, PCB’s, the transportation and storage of nuclear waste, the contamination of drinking water supplies and the necessity of maintaining a reliable public infrastructure for such water supply. And of course there are the critical economic and political problems associated with our excessive dependence on imported petroleum. We should focus on those, and stop chasing the global warming phantom.

One final note: nuclear power plants generate no CO<sub>2</sub> in their normal mode of operation, so one would think that global warming believers would be pushing nuclear power as the cleaner alternative to coal-fired power plants. Yet, Gore, in his movie and in his book doesn’t even mention nuclear power. Cockburn, in his series of articles discusses that issue in more detail. In the late 1980’s, when I first started studying this issue, I spent a summer doing combustion

and fire research at the National Center for Scientific Research in Orleans, France. I was surprised to find so many otherwise intelligent scientists uncritically buying into the human caused global warming arguments.

But, of course, that was France, a nation that had already completed committed itself to nuclear power. Even here in the U. S., there are environmentalists who would normally be opposed to more nuclear power plants, but who are so taken in by the global warming hysteria, that they consider nuclear power as the lesser of two evils, and are leaning toward nuclear power as the solution to the global warming crisis. And if you believe that, I have some bridges in Brooklyn that I would like to sell you!

Dr. Martin Hertzberg is a combustion research scientist who worked on the prevention of fires and explosions in mines and other industries at the Bureau of Mines in Pittsburgh, PA. He also contributed to our understanding of the fundamental mechanism of combustion in gases and dusts. He currently teaches science and mathematics at various educational institutions, and occasionally consults as an expert on the causes of accidental fires and explosions. He served as a meteorologist in the US Navy and has been studying the global warming issue for the last twenty years.

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