Extract from Fred Singer's interview for PBS, published on May 28, 2007

Exercise of Week 1

Let's go back to the basic physical principles. People like John Tyndall did experiments in the nineteenth century, where he filled tubes with different gases and found that certain trace gases--CO_2 and also gases like water vapor-- had the ability to block infrared radiation. And that basic physics suggests the natural greenhouse effect takes advantage of this, suggests that part of the reason we have the climate we have is because of that, and that if you added to it continually and for long enough, you would increase the optical thickness of these gases and, therefore, would trap more heat in the system. From that standpoint, you don't deviate, do you?

There's nothing wrong with the basic physics. There's nothing wrong with laboratory physics, with measurements taken in the laboratory. They can be made very precisely, and under controlled conditions. Unfortunately, the atmosphere is not a laboratory that you can put into a building and control. The atmosphere is much more complicated.

For example, as carbon dioxide increases, you would expect a warming. But at the same time that you get this warming or this slight warming, you get more evaporation from the ocean. That's inevitable. Everyone agrees with that. Now, what is the effect of this additional water vapor in the atmosphere? Will it enhance the warming, as the models now calculate? Or will it create clouds, which will reflect solar radiation and reduce the warming? Or will it do something else? You see, the clouds are not captured by the models. Models are not good enough to either depict clouds or to even discuss the creation of clouds in a proper way. So it's not possible at this time to be sure how much warming one will get from an increase in carbon dioxide.

I personally believe that there should be some slight warming. But I think the warming will be much less than the current models predict. Much less. And I think it will be barely detectable. Perhaps it will be detectable, perhaps not. And it certainly will not be consequential. That is, it won't make any difference to people. After all, we get climate changes by 100 degrees Fahrenheit in some places on the earth. So what difference does a 1-degree change make over 100 years?

Some people would say that we've got inertias in the system. All we're seeing are delays caused by other anthropogenic forcings we're putting into the atmosphere--like aerosols--either directly or producing clouds...or ocean lag in the system...and that actually the lack of warming isn't a cause for complacency. It's really a worry, because when it comes, it will be hard to get out of. What about that as an argument?

We have to distinguish between delays, which have their cause in the heat capacity of the ocean. That's one issue. But we also must look carefully at other human activities that can produce a cooling, like the production of aerosols. How are aerosols produced? Well, one way is to burn coal and release a lot of sulphur into the atmosphere. Fortunately, now we [are] beginning to use clean coal. We're actually taking the sulphur out of the smokestacks so that the aerosol production is no longer

as important. Also biomass burning, burning of forests, produces a lot of smoke and particulates in the atmosphere. Agriculture disturbs the land surface so that winds can then pick up dust. And dust in the atmosphere is another aerosol.

All of these particles in the atmosphere have some effect on climate. Some will cause a cooling. Some will cause a warming. Different particles act in different ways. Depends on whether the particles are black (soot), in which case they absorb solar energy, or whether they're reflecting...whether they reflect solar energy back into space. That has to be done carefully.

One of the leading climate modelists is Jim Hanson. He actually was the man who, ten years ago, went out on a limb and said he was sure the enhanced greenhouse effect was here. He now says we can't really tell. He says the forcings are so uncertain that they're much more important than the climate models. In other words, until we get the forcings straight, the climate-model predictions are not worth very much. That is basically what he said.

But there's this argument: Yes, the aerosols are there and might counteract some of the enhanced greenhouse effect. But, they will be washed out within a few days and, therefore, wouldn't continue to accumulate in the way that CO_2 does. CO_2 stays around for 100 years. Therefore, the two things really aren't in balance. They might balance for a bit, but over a long period of time, if you go on producing CO_2, this will concentrate, while the other will get washed out. And if you look ahead and project the use of fossil fuels, isn't it going to overwhelm the other forcing factors?

Aerosols have a very short lifetime in the atmosphere, measured typically in a matter of a week, two weeks, something like that. And then they rain out, or they fall out. Carbon dioxide has a lifetime measured in decades. Some of it survives even beyond 100 years. So if carbon dioxide effects were important, then they would eventually predominate.

But the question is: Are they important in relation to the aerosol effects? Or, put it this way: Are the aerosol effects hiding the effect of carbon dioxide now? We can tell. We can find an answer to this, because we can look for fingerprints in the climate record. Since aerosols are mostly emitted in the northern hemisphere, where industrial activities are rampant, we would expect the northern hemisphere to be warming less quickly than the southern hemisphere. In fact, we would expect the northern hemisphere to be cooling. But the data show the opposite. Both the surface data and the satellite data agree that, in the last 20 years, the northern hemisphere has warmed more quickly than the southern hemisphere. So it contradicts the whole idea that aerosols make an important difference.

This is very embarrassing to the modelists, because they have been using the aerosol as an excuse to explain why the models do not agree with observations. I suggest that they now will have to look for another excuse.

If you're right and they're wrong, then is what they're doing falsifiable? If, for instance, the next ten years was unusually cold, would that make them give up their theory?

The climate business doesn't work the way laboratory science does. If the next ten years turn out to be cold, this by itself does not prove anything. It just makes it less likely that global warming is important. Because people will say, "Well, now instead of having 20 years of satellite data, we have 30 years of satellite data." They'll say, "Well, that's not really long enough. We need 100 years of satellite data that show cooling." And inevitably during the next 100 years, you're going to have some warming, because the climate is constantly changing. Certainly it will change as the solar radiation becomes stronger or weaker. And we know solar radiation does fluctuate on an 11-year cycle and on longer cycles.