

plans that they had for certain atomic developments because of this waste problem. So I think it is fine to do these things. I think we have to work harder on these problems than we have in the past. Many people knew and saw these things coming but they were voices in the wilderness.

I think right now the very fact that we are interested in Lake Erie, or I'm interested in the pollution of the inland waters of California, is a good thing because others will become more conscious of the problem. I would like to make that observation and see whether you agree with it or not.

Dr. MACLEOD. Chairman Miller, indeed I do agree with what you said. In the examples of very large scale effects that may be occurring, I did not choose the sea, but I might just as well have. The examples I used concerning the production of carbon dioxide and the raising of carbon dioxide in the atmosphere and the possible depletion of oxygen from the atmosphere could just as well have been exchanged for the oceans themselves. We don't have an understanding of what we are doing when we are dumping wastes of all kinds into them and they are not the inexhaustible sink that used to be thought of.

We know that, particularly in the estuaries and in the coastal regions, there is extensive contamination. We don't know yet how significant this is in the broader reaches of the ocean. However, I should recall that penguins in the Antarctic are already demonstrated to have had it in their fat. How it got there we don't know, but the fact of its presence seems to be incontrovertible.

This seems to indicate some very widespread contamination in creatures, with the same biochemicals.

Mr. BROWN. Mr. Conable?

Mr. CONABLE. I would like to ask a few questions about carbon dioxide level in the air. Does this result in the striking of a new balance? Does it encourage the growth of new green plants in which photosynthesis can occur? Is this one of the reasons we get the so-called greenhouse effect?

Dr. MACLEOD. I will attempt to answer those, sir.

With an increase of carbon dioxide in the atmosphere, there will be some increase in photosynthesis with uptake of carbon dioxide. However, the increase in carbon dioxide uptake by the photosynthetic plants might not be nearly enough to compensate for the great increase that has been put into the atmosphere.

Now, as to the greenhouse effect, if I might explain that very briefly. The sun's radiation falling on the earth comes through a blanket of carbon dioxide and the visible light comes through very easily. However, carbon dioxide in the atmosphere has a very definite effect on holding down the infrared radiation—the heat radiation that goes back up—so that if you increase the content of carbon dioxide in the atmosphere you prevent the dissipation of heat from the earth's surface. Therefore, the heat rises, and this is why it is called a greenhouse effect.

Mr. CONABLE. Is there already a demonstrable increase in the carbon dioxide content of our atmosphere?

Dr. MACLEOD. There have been some studies that indicate it. I wish that the information were better than it is, but the problem is