

that we formulated—without any specific regard to noise—very definitely placed noise among the other kinds of pollution.

I agree with all the things you say, but I say both that if you try to define pollution in at all general terms, noise is there, and if you look at things that affect the quality of people's lives, noise is there too.

Mr. DADDARIO. It creeps in even though you don't look at it scientifically.

Dr. TUKEY. Even though you didn't expect it in the beginning.

Mr. DADDARIO. Dr. Tukey, I would like to touch on two parts of your committee's report and ask you to talk about them.

On page 3, in the third paragraph, in the second sentence, your report states "attempts to identify possible effects of ordinary urban air pollution on longevity or on the incidence of serious disease have been inconclusive."

And then on page 14, in the fourth paragraph, your report states: "We now know that the full effects of environmental changes produced by pollution cannot be foreseen before judgments must be made. The responsible judgment, therefore, must be the conservative one. Trends and indications, as soundly based as possible, must provide the guidelines; demonstration of disaster is not required." How do you read into all of this the fact that even though, in many areas, we have no conclusive evidence to go on as to effects, that the approach must be conservative with the idea that a demonstration of disaster is not required before we begin?

Dr. TUKEY. No, I think this sort of thing, trying to bring such points together, is very desirable.

As I take it, you are asking about the application of the rather general principles on page 14 to the specific question of long-term exposures to ordinary urban air pollution, how would I personally relate them?

The situation is approximately as follows: I think almost all the members of the Panel felt that there must be unfavorable effects from long-term exposures to urban air pollution, but were unable to find any solid evidence that this is in fact so.

The question of doing statistical epidemiological studies as to the effects of chronic influences on people is an extremely difficult one. You will still find a fair amount of discussion about the effect of cigarette smoking on human health, which is an effect that ought to be more easily measured than many pollution effects because it is caused by an individual activity. We all believe that such effects are due to the cigarettes an individual smokes and not the ones our neighbors smoke. To try to get at the effects of more pervasive, less individually attached influences such as pollution, is much more difficult.

There has been a fair amount of effort in trying to make studies of this sort directed to urban air pollution. I think that one can clearly say that these studies have shown that the effects that appear to be associated with urban air pollution are not as large as the effects that appear to be associated with cigarette smoking.

That doesn't mean that they aren't important.

I would, myself, include a concern for the human health effects of urban air pollution in coming to judgments and decisions about what we are to do about it. I would not feel that there was evidence by