

But what is the real problem that confronts us? We want to know the effects of pollutants, particularly mixtures of them, on human subjects undergoing very long-term exposures to quite low concentrations. So, it would seem that the work that had been done was just the opposite of what was needed. And, to add the coup de grace, enough was known about the effects of air pollutants on human populations to realize that certain predisposed individuals—the respiratory cripples, asthmatics, chronic bronchitics and cardiopulmonary cases—were especially liable to adverse effects. But there were no analogous experimental studies on such special types of population; that is, animals in which a functional impairment had been established before exposing them to pollutants.

We approached representatives of the coal-burning electric power utilities a few years ago with the suggestion that biological studies be undertaken in which many of the defects seen in earlier work would be overcome by means of adequate experimental design. In due course, the Edison Electric Institute and the National Coal Association, with minor contributions from two or three other sponsors, authorized a five-and-a-half-year series of investigations at a cost of \$2.2 million. A recent analysis indicates that the program will actually require 7 years to complete and the total cost will be \$3.3 million. The work on this program commenced in June 1966, a year and a half prior to the adoption of the Air Quality Act of 1967.

Mr. DADDARIO. Has that 7-year and \$3.3-million proposal been approved? Do you have the funds for it? Are you going ahead with it?

Dr. MACFARLAND. We haven't the funds for it yet.

Mr. DADDARIO. You have the funds for the 5-year study at \$2.2 million, but do you expect the same people would support the additional expenses?

Dr. MACFARLAND. We have hopes of getting an additional sponsor now to provide the remaining \$1.1 million that we need. In the months preceding the authorization of this contract in June 1966, we had approached the U.S. Public Health Service to see if they would contribute to the financial support of this project. They refused. More recently, particularly with the enactment of the Air Quality Act, we believe there is a possibility now that they may be prepared to reconsider their earlier decision. So we have started to approach them with a view to seeing if they might provide the additional \$1.1 million that will be needed to complete the program.

Mr. DADDARIO. Was the Public Health Service refusal based on financial reasons or was it based on their disagreement with the way in which the studies would take place?

Dr. MACFARLAND. I think for financial reasons. The history of the development of this project, and the design of the experiments is a rather long and involved one, and the opinion of experts in the field was solicited many times before the project took its final form. Among the experts whose opinions were sought were some from the Public Health Service, so that when the final proposal was prepared it carried the imprimatur of the Public Health Service. They had no objections from a technical point of view. I assume, then, it was a financial limitation that resulted in their refusing to help at that time.

Let me give some of the details of the design of this study. The pollutants selected for examination are sulfur dioxide, a gas; sulfuric