

tion, perhaps its merchandising philosophy, is likely in, say, the next 50 years, to devote enough of its own research funds to come up with an alternative type of propulsion to the internal combustion engine?

Dr. MACLEOD. That would be very much of a personal opinion and I suppose from that point of view it is no better than that of anyone else, and perhaps not as good as many others. I believe that if we do bring to the attention of the people at large the magnitude of the problem and the kinds of solutions that are necessary and if we do set standards which will require new technology in order to market, that one can have a profound effect on the kinds of instruments that are developed.

In the case of the battery powered vehicle or the fuel cell powered vehicle, I don't believe that up until this time the public has been so convinced that this will be significantly better than the improved autos with less amount of effluent from the exhaust, that the public is really convinced that we need to push for it. I know that some of the battery companies are working on improved batteries and certain of the large electric companies are working on fuel cells. I don't know really whether they could be working harder and that they could bring the day closer. I just don't know whether the magnitude of effort could be increased to accomplish this.

Mr. BROWN. The point that I'm making, is that in California where this exhaust effluent problem is, the most serious, the public was well aware and eager for action 20 years ago and still no action was taken. When we decided that we needed fuel cells for the lunar program, the public didn't care whether we used fuel cells or not, but the needs of the project and the compulsion of the program resulted in their development. What I'm leading to is, Is it not possible that we are going to make rapid advances in this field only if the Federal Government takes a considerable amount of leadership in encouraging the necessary research and not rely on either the public or the industry?

Dr. MACLEOD. Yes, I believe, sir, the Federal Government must take leadership. I don't know how much in the way of resources the Federal Government needs to put into, for example, these two developments that we have been talking about, but I think this should be looked at, definitely.

Mr. DADDARIO. Dr. MacLeod, I hope we might have the opportunity to send some further questions to you. We have other witnesses today, but we hope you might provide us answers for the record. (Additional questions and answers for the record may be found in volume II.)

Dr. MACLEOD. I shall be very glad to.

Mr. DADDARIO. We certainly appreciate your being here.

(The complete prepared statement of Dr. Colin M. MacLeod follows:)

PREPARED STATEMENT OF DR. COLIN M. MACLEOD, DEPUTY DIRECTOR, OFFICE OF SCIENCE AND TECHNOLOGY

Mr. Chairman and members of the committee, although knowledge of the damaging effects of pollution has existed for a long time, particularly in industrialized societies, the impulse to do something about it has been slow in coming. While there are multiple reasons why this has been so, perhaps the most important have been first, the slow appreciation by the public that human sewage