Chairman MILLER. Isn't it true that the condition of the engine has a good deal to do with it? I can't be critical because I have driven some old cars myself, but every once in a while you see a car going down the street that has loose rings and there is a cloud of gas behind it. I think if we could get rid of some of those things that pollution would be reduced a great deal. A car with a poor engine in it isn't consuming its gas. I would guess that it gives out as much pollution as maybe a dozen good cars with tight engines, isn't that right?

Dr. HIBBARD. I think this is one of the problems with the current devices which are being put on the 1968 cars. They require adjustments of the carburetor in some cases or the maintenance of the engine; and if the public lets some of these adjustments go by the board, the abatement devices will be a lot less effective than they might otherwise be.

Mr. VIVIAN. On the subject of auto exhaust as I understand it, your principal involvement is an analysis of the exhaust gas problem, not the development of new devices. Have you spent any funds in the Bureau on the development of new control devices?

Mr. PERRY. The only work that the Bureau has done on this was some afterburner catalyst work. One of the ways to eliminate pollution from this source is to take the unburned hydrocarbons and partially burned hydrocarbons and burn them in the exhaust pipe where they are changed to carbon dioxide and water. We did some early work for the Public Health Service with respect to use of catalytic afterburners and the testing of a number of devices. We have also worked on the development of catalysts that might be useful for this purpose, particularly ones which would be not sensitive to the lead in the fuel, which is the real problem with these catalysts. However, with the announcement that the automobile industry had found a solution to this problem, other than the use of exhaust devices, the interest in this problem declined, although I think it will step up again now. We have not been working on this for the last 2 or 3 years, but prior to that we did work on this problem.

Mr. DADDARIO. We have another witness and even though we have a number of other questions, I hope we might be able to submit them to you and get your answers for the record. Thank you ever so much, all three of you, for coming.

(Additional questions and answers for the record may be found in vol. II.)

(The biographical statement and complete prepared statement of Dr. Walter R. Hibbard follows:)

BIOGRAPHICAL STATEMENT ON DR. WALTER R. HIBBARD, JR.

Dr. Walter R. Hibbard, Jr., one of the Nation's outstanding metallurgists, became Director of the Bureau of Mines on December 1, 1965, following earlier successes as an educator, researcher and as an industry manager of scientific and engineering research.

Born in Bridgeport, Connecticut, January 20, 1918, Dr. Hibbard was graduated from Wesleyan University, Middletown, Connecticut, and received a Doctor of Engineering Degree from Yale University in 1942. Following his military service in World War II as an officer in the Navy Department's Bureau of Ships, he joined the Yale faculty as an Assistant Professor and later became Associate Professor.

Dr. Hibbard's growing reputation in teaching and research attracted industry, and in 1951 the General Electric Company enlisted him for its Research and