case of cars to be sold in California, interim standards were set which, in effect, mean that converters must be installed. As a result of these decisions, General Motors, which sells roughly half of all cars sold in the United States, plans for most, if not all, of its 1975 model cars to have the catalyst and not merely those cars destined for the California market; Ford and Chrysler plan to install them on all 1975 cars sold in California. The result is that up to 6 of the 10 million new cars built next year could have catalysts. EPA is due to begin certification tests on the 1975 cars in November, and Detroit's mass production begins next July. If the catalyst turns out to be "a bust," as one agency legal expert said recently, "Can you hold them [the manufacturers] to any standard? . . . What's at stake here is a whole regulatory program."

This by now agency-wide concern originated from some tests made by industry and EPA beginning about a year ago, which showed that relatively large amounts of sulfuric acid, which in the atmosphere eventually become sulfate, were coming from the tailpipes of catalyst-equipped cars.

John B. Moran, director of fuel registration for EPA, is the scientist who first drew the problem of the catalyst to the attention of officials. He says that all researchers who have looked at the catalyst-sulfate problem agree that more sulfates are emitted from catalyst-equipped cars than from cars not so equipped. In his opinion, EPA should not permit catalysts to be used unless they are shown to pose no health hazard.

Data from the tests made thus far vary widely, but they are alarming enough to have caused the EPA to launch a special $1.8-million research program to examine the problem further. This crash research program is expected to reduce those uncertainties which have arisen from the use of various test methods and assumptions.

Esso Research and Engineering Co., running a catalyst-equipped car fueled with gasoline having 0.04 percent sulfur, found that 14 percent of it was converted into sulfuric acid mist by the time of emission. For pedestrians at the roadside, Esso calculated, this could result in concentrations of 35 to 45 micrograms per cubic meter. EPA scientists in Research Triangle Park, North Carolina, using the same test procedure and sulfur weight fuel, found that 30 percent of it converted to sulfuric acid mist; EPA estimates roadside concentrations during peak periods could be 60 $\mu g/m^3$. The highest numbers so far have been obtained by Ford, whose scientists, using this same test procedure and sulfur weight in fuel, found 80 percent of it converted to sulfuric acid and estimated roadside concentrations of from 80 to 150 $\mu g/m^3$. Moran estimates that under "worst case" atmospheric and traffic conditions, where emissions would not disperse away from the roadside, concentrations three to four times these levels could result.

In the above tests a type of catalyst but by Engelhard Co. was used. But GM, using a different catalyst, has obtained different results. GM scientists using 0.04 percent sulfur fuel have found only 10 to 15 percent of it converted to sulfuric acid mist, and found average, 8-hour city-street concentrations of 5 $\mu g/m^3$. Frederick W. Bowditch, who is in charge of GM's emissions research, points out that so far virtually everyone's assumptions in these various tests are different. GM's lower numbers, he says, are most "obviously" explained by intrinsic differences between the GM catalyst and the Engelhard one. But he added, "None of us has run our cars in the other guy's lab. It could be a difference in test procedures, or in the cars themselves, or something else."

Science Still in Public Favor

Whatever the strength of the antiscience movement, it is not enough to have shaken the general public's faith in science and scientists or to have turned the man in the street into a raving Luddite. Such, at least, is the gravamen of a survey conducted for the National Science Foundation (NSF) by the Opinion Research Corporation of Princeton, N.J., and published in the 1973 report of the NSF board.* Based on interviews in 1972 with some 2200 people representing a cross section of the adult population, the survey depicts generally favorable attitudes toward science and its ability to solve national problems.

Asked the predominant emotion they nurtured toward science and technology, 49 percent of the respondents checked "satisfaction and hope," 23 percent confessed to feelings of "excitement or wonder," and only small minorities expressed "fear or alarm" and "indifference or lack of interest" (6 percent each). In a prestige list of nine professions, scientists were ranked second, a notch less esteemed than physicians, but one above ministers of God. Fifty-four percent of the sample believed that science and technology do more good than harm, only 4 percent subscribing to the converse proposition.

Other favorable attitudes toward science were expressed in the answers to questions such as, Do you feel that science and technology change things too fast? (22 percent), too slowly? (16 percent), or just about right? (51 percent). There is quite considerable optimism that science will eventually solve major problems of society such as pollution, drug abuse, and crime. (Thirty percent believe science will solve most problems, 47 percent that it will solve some, and 16 percent that none will be solved.) The NSF's pollsters conclude that, on the whole, "public attitudes toward science and technology appear to be positive."

But the survey turned up some negative or puzzling features. Queried about the role of science and technology in causing society's problems, 48 percent of the sample held them responsible for some problems, 7 percent for most. Asked which areas of science they would most like to see their tax dollars support, the respondents gave first priority to improving health care and fighting crime and pollution, but the area described as "discovering new basic knowledge about men and nature" appeared near the bottom of the public wish-list. This response raises doubts both as to how well the respondents may have understood the not unsubtle questions being posed, and to how high the concept of science for science's sake may stand in the public's affections.—N.W.

* *Science Indicators 1972* (Government Printing Office, Washington, D.C., 1972), price $3.35. For other aspects of the report see *Science*, 21 September, p. 1150.