in Los Angeles may decline by as much as 20 percent, and visibility in Denver may decline by as much as 50 percent.

After considering all these problems, the NRC committee decided that the risks were not great enough or well enough defined to justify the EPA's 1985 standard of 0.2 gram of particulates per mile. Instead, the report concludes, the EPA should keep the present standard and review it every 3 years, beginning in 1983, to see whether it needs to be strengthened. "Only a relatively small number of diesel-powered cars will be made and sold in the next few years," the report notes, "so the benefits and risks will appear slowly. Exposure to diesel emissions, for instance, will be at a low level for some years. . . ." The authors claim that society may benefit by encouraging "dieselization" of the auto fleet: oil consumption may be reduced and traffic fatalities may be reduced if people take advantage of the economies of switching from fragile gas-powered to heavier and safer diesel-powered cars. In general, the report urges the EPA to be more flexible, to impose strict standards first on heavy polluters (trucks and buses), and to set less ambitious standards at shorter intervals.

One of the NRC's recommendations for relaxing standards has already been adopted. On 24 December, the EPA published in the *Federal Register* a proposal that would change the way the agency calculates particulate emissions for light-duty diesel trucks and cars. Rather than require every vehicle in 1985 to meet a standard of 0.2 gram of particulates per mile, the EPA would allow manufacturers to average the emissions from several types of engine, requiring the entire company fleet of diesels to meet the standard. As an EPA official explained, this will benefit companies that produce several types of diesel engine. The effect will be to make it cheaper to produce large diesel cars, the EPA says, saving U.S. automakers several hundred million dollars.

There is an important flaw in the NRC report, according to David Doniger, an attorney at the Natural Resources Defense Council. (He has asked the government on NRDC's behalf to reject General Motors' petition.) Doniger claims that the study is a year and a half out of date, and that "technology for controlling diesel emissions has advanced at a breakneck pace" since the last deliberations of the NRC committee in August 1980. He singles out for particular criticism this statement in the report's summary:

> None of the particulate control devices now under development has yet been proven in road durability tests of 50,000 miles. The history of developing the catalytic converter for gasoline engines in the early 1970's suggests about a five-year lag between the design and demonstration of such devices and their production and commercialization—an interval that will make it difficult for the larger and heavier diesel cars and pickup trucks to meet the EPA's 1985 standard.

Doniger says, first, that the car manufacturers themselves have told the EPA in public proceedings that it will take 3, not 5, years to deploy a particulate exhaust filter once they have decided on the correct technology. He pointed this out in written comments to the authors of the report earlier this year.

In addition, Doniger says one company, Johnson Matthey of West Chester, Pennsylvania, has already developed a good particulate filter and that the device has all but proved its viability in a long-distance trial being run in Texas. The NRC report may be correct that no device has endured the full 50,000 miles required by EPA's road test, but the Johnson Matthey device has gone 40,000 miles with no problems.

George McGuire, vice president in charge of research at Johnson Matthey, says that last summer and fall he wrote twice to Frank Press, president of the National Academy of Sciences. McGuire says he asked the diesel study committee to "come again and see what we've accomplished since their last visit" in 1980. He got no answer to the first letter. Then on 20 November he received a brief note from Press saying that his letters had been forwarded to the diesel committee. By then, of course, the report had been written. The committee had held its last meeting in January of 1981, 10 months earlier, and it was not about to rewrite the report just to accommodate one small exhaust device.

McGuire claims that his filter, a trap oxidizer that fits onto the tail pipe, has proved its effectiveness for use on a Volkswagen Rabbit. He expects it will soon be certified by the EPA as having passed the 50,000-mile test, with insignificant effects on fuel economy. By next spring, McGuire says, his company could be producing the device at a rate of 100,000 a year. Within 2 years, the annual production rate could be in the millions, if the capital were available. McGuire says the price charged to the car manufacturers would be $75 to $100 per filter in 1985 dollars.

The chairman of the diesel impacts study committee, Henry Rowen, has taken leave from Stanford to work at the CIA and does not wish to comment. However, David Hazen, executive director of the National Academy of Engineering, did offer an opinion. He says Doniger is correct; the report is a year old. There were problems in production and in getting some of the calculations finished. But Hazen adds that committee members were given copies of Doniger's critique of the draft report, and after seeing it they did not find it necessary to make any changes.

"It really is stretching a point," Hazen believes, "to say that the technology is available today when the 50,000-mile durability test has not been completed." The assertion that it will take 5 years to deploy a particulate control device, according to Hazen, is based by historical analogy on the time needed to develop the catalytic converter for gasoline engines. Finally, Hazen agreed that the committee may have shown bad judgment in deciding not to hold an open meeting to review data in the report with interested people like Doniger before publication.—ELIOT MARSHALL

Philip Handler Dies

Philip Handler, president of the National Academy of Sciences from 1969 until his retirement last June, died on 29 December in Boston where he had been hospitalized for several months. Death was attributed to lymphoma complicated by pneumonia. Handler was 64.

As a statement from the Academy noted, Handler was always open about the satisfaction he felt in the NAS presidency which he held for the statutory limit of 12 years. "I have had an absolutely glorious time," he said just before his retirement. "Opportunities for service which are at the same time warm, loving, rich experiences are very rare. I have been very fortunate. . . ."

In October, President Ronald Reagan awarded Handler the National Medal of Science, citing among other qualities his "national leadership in furthering the state of American science."

Handler, a biochemist, spent most of his academic career at Duke University, to which he had hoped to return after leaving the Academy.

—B.J.C.

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