have consistently and forcefully set forth the technical aspects of these problems so that when decisions are made by the appropriate officials they will not be made in ignorance. This is all that any science adviser can hope or expect. Scientists advise on scientific matters; they do not (and are not competent to) decide on issues in which nonscientific elements may be overriding.

In his summary, Perl blames the lack of "effectiveness" in certain areas on the "multiple functions" of the scientific establishment. In fact, this is one of the great strengths of the advisory system. How could its functions be other than "multiple" in view of the growing multiplicity of national problems that have some scientific content? They should be more multiple and be extended into areas such as transportation and housing.

Perl expresses his greatest concern about environmental problems, which are serious and which, by their nature, cannot be solved by scientists alone. Yet many scientists are working hard on the technical problems. Responsible groups have not attempted to advocate impractical panaceas—such as prohibiting the use of the automobile, of DDT, or of phosphates in detergents. On each of these issues there are many pros and cons—scientific as well as economic. There is no known nonpolluting substitute for the motor vehicle, although the new ones are getting better every year. DDT, many scientists think, has done far more good than harm in the world, and there is no general substitute for it, as there is none for phosphates in detergents.

Our nation faces many different problems—as does the whole world. Shall we blame only the scientists? What about economists, political scientists, lawyers, businessmen, labor leaders—and the *people?* We all share the burden and the responsibility. To discredit one group, who are, and have been for a long time, working on advancing our knowledge and promoting its more humane use is only to impede, not accelerate, progress.

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In Clark's letter and in much of DuBridge's letter just the first two-thirds of my article are discussed. Generally they agree with my conclusions that the scientific advisory system is effective on limited technical questions but ineffective on broad technical questions. Their criticisms are either that it is inappropriate to judge the scientific advisory system on broad technical questions, or that the scientific advisory system should not be expected to be effective on such questions. In studying the scientific advisory system, I did not concern myself with what was appropriate or with what was to be expected, but only with the behavior of the advisory system and the response of the executive branch. Certainly the broad technical questions should be included in such a study.

More important, Clark and DuBridge ignore the last third of my article, where I concluded that "the advisory system, as presently constituted, combined with the multiple functions of the scientific establishment, is detrimental in important ways to the process of technical decision-making in this country." This conclusion does not depend upon whether one agrees with my evaluation of the effectiveness of the scientific advisory system on broad technical questions. Obviously, if one agrees with that evaluation, this conclusion is more distressing.

DuBridge, in the latter part of his letter, suggests that I was criticizing all of science or all scientists. This I was certainly not doing. I do not lay the failures of the scientific advisory system on all of the scientific community.

With respect to Long's letter, I am in general agreement—there is more work to be done. But I see no value in describing as an informal scientific advisory system the groups he mentions, groups which I also indirectly referred to in my discussion of the scientific community. These groups, when they are effective, are usually acting as pressure groups or as political groups, not as advisory groups. When they act only as advisory groups, they are usually ineffective.

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Pregnant Baboons

I am engaged in automobile safety research. I am designing and testing the most appropriate restraint systems for pregnant occupants of motor vehicles. This research has utilized pregnant baboons in different stages of pregnancy. At the present time, our

supply of pregnant baboons is waning, and in order to complete the research, I need more than our breeding colony can supply. Would anyone with baboons in the early stages of pregnancy, who would be interested in selling them, please contact me. All inquiries should be directed to my address below.

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Coal Workers' Pneumoconiosis

Despite Joseph Pichirallo's attempt to be impartial, there are several half-truths in his account (News and Comment, 8 Oct., p. 132) of the present dispute over coal workers' pneumoconiosis (CWP). This is a disease caused by the inhalation and retention of particles of coal, and a definition of the disease has been agreed upon by both the International Labor Office and the World Health Organization—the retention of coal dust in the lung and the tissues' reaction to it. Furthermore, it has been shown that there is a strong relationship between the amount of coal dust in the lungs and x-ray category. Since the onset of complicated CWP is directly related to the dust content of the lung, and since this form of CWP is universally accepted as both disabling and as a cause of premature death (in contrast to simple CWP), the x-ray remains the only way of quantifying dust exposure and hence the likelihood that complicated CWP will develop.

Simple CWP leads to only minor impairments of pulmonary function that are not associated with respiratory disability and cannot be diagnosed from a chest film. However, the issue is confused by the fact that chronic bronchitis and emphysema probably occur more frequently in coal miners than in the general population and likewise cannot be recognized in a chest x-ray. The major cause of these diseases in miners is cigarette smoking, although it is likely that dust exposure has an additive effect.

The chest x-ray is used by the Social Security Administration to determine dust retention in the lungs, and there would seem to be much justification for their policy. However, under the