NIH officials stress that their only criticism of the report and Harvard's behavior has to do with the issue of federal notification. Any other possible comments will wait, they say, until the NIH investigation of the affair is finished. A four-member team† of advisers to NIH will meet in February for initial review of the case and then travel to Harvard in March to conduct an investigation. NIH has not yet decided whether the report will be made public.

†Howard E. Morgan, chairman of the committee and professor of physiology at Pennsylvania State University; Francis J. Klocke, professor of medicine at the State University of New York at Buffalo; John T. Sheperd, dean of the Mayo Medical School; C. Kern Wildenthal, dean of Southwestern Medical School, University of Texas at Dallas.

On the issue of notification, however, the NIH has taken a strong stance. Raub appeared in a live interview on the news program "CBS Morning with Charles Kuralt and Diane Sawyer" the day after Harvard released the blue-ribbon committee's report. Asked if Harvard or any medical center using federal funds had "a legal or at least an ethical or moral responsibility to notify NIH when something like this happened," Raub replied: "They do have an obligation, and we in turn have an obligation to the public whose tax money this is to ensure that every case of real or apparent misdoing in science is identified and dealt with promptly and forcefully." Raub later told *Science* that in the Harvard case the prompt notification of federal officials applied even if the contentions of Darsee's colleagues were ignored or the questions about the retention of raw data were left unanswered. "Where an incident is witnessed, where it is admitted—that is enough to go over my threshold," says Raub, who spoke on the subject for NIH at a 1981 congressional hearing on fraud in biomedical research. "The event itself is then worthy of notification. On the other hand, reporting it doesn't necessarily mean banishing the guy into the outer darkness. I think they could very well expect the feds to participate in a positive effort to try to help deal with the individual."

—WILLIAM J. BROAD

"Prevention of Dishonesty in Science"

In addition to evaluating Harvard's response to the recent incident of fraud, the blue-ribbon committee offered suggestions about preventing dishonesty in research and also called for a national conference to consider several important questions about the scientific environment and the responsibilities of institutions in which dishonesty occurs. The essence of their statement follows:

. . . The committee believes that the preventive measures most likely to be effective are those directed at the circumstances and practices in the laboratory which stimulate dishonest behavior in some people. In addition, observing the behavior of investigators working in the laboratory can be helpful.

The committee observed that a reported major scientific discovery will be confirmed or refuted rapidly because of the great impact it will have on the direction of science and the strong motivation of other laboratories to verify important data. The probability that spurious or fraudulent results will be discovered by others relates directly to the significance of the report and the number of scientists working in the same field. Therefore, the practice of reporting research results in small segments affords an opportunity for dishonesty because such reports are less likely to be verified by others.

The following measures are suggested as helpful in preventing dishonesty and its detection if it does occur:

- Special attention should be given at the time of recruiting to the motivation and integrity of the applicant through careful examination of credentials and claimed accomplishments.
- Written, detailed, explicit procedures for data gathering, storage, and analysis are essential and should be available in all laboratories.
- Fellows should be supervised by experienced scientists in the laboratory including regular, in-depth scrutiny of the primary data and the calculations leading to the presentation of results. The laboratory director should, by example, develop in the fellows a respect for primary data and its preservation.
- The conduct of studies which are blind or coded, and the exchange of reagents or methods between laboratories should be encouraged. The repetition of research in the same laboratory and by different research teams is desirable whenever possible.
- Fellows should be encouraged to work with other colleagues, to share data and to engage in free discussion of results. Secrecy about methods and data should be discouraged.
- Emphasis should be placed upon the quality and significance of research rather than on quantity and visibility. The laboratory director should accept responsibility for the quality of the work reported from the laboratory and should actively discourage the submission of multiple abstracts to national meetings. Abstracts should be considered as reports of results worthy of publication and as forerunners of complete papers rather than as bids for appearance on a national program.
- There should be close personal interaction between faculty and fellows. Among the many benefits of such close interaction could be the early detection of personal problems or unusual personality traits.

We further suggest that a national conference involving the NIH and universities be convened to consider a number of unanswered questions:

- Are there steps which could be taken at the national level to encourage the evaluation of young scientists on the basis of quality rather than numbers of publications? These policies must be addressed not only by universities, but also by editorial boards, granting agencies, and study sections. It has been suggested that scientists who fragment their results into many papers should be criticized rather than rewarded.
- Should national societies examine their policy regarding limitation of multiple abstracts with the same first author?
- What is the responsibility of the institution discovering dishonesty in scientific research to other institutions, to the scientific and medical community, and to the public at large?