includes institutional review boards and NIH advisory councils within each of the NIH funding institutes, they recommended no further levels of administrative review. And they seemed content that present-day laws on donating hearts, kidneys, and other organs from the deceased are adequate to cover tissue from deceased fetuses.

Law professor Patricia King of Georgetown University Law Center was particularly articulate on this point. "Society accepts and endorses" organ transplantation and has laws on how to go about it. "We don't accept selling organs, for instance," she said. "Fetal tissue transplantation is analogous," she asserted. "We [the panel] spent far too much time on abortion."

Although the focus of discussion was on ethical issues, an entirely practical consideration also figured in the panel's decision to endorse fetal tissue research— the "If we don't do this research, others will, perhaps without safeguards" argument. Within the past few weeks, physicians at the University of Colorado and at Yale have actually transplanted fetal neural tissue into Parkinson's patients, using only private funds but following ethical guidelines. Physicians in Mexico, Sweden, England, and elsewhere also are currently conducting human experiments with fetal tissue for Parkinson's victims.

Citing the U.S. experience with in vitro fertilization, Ryan of Harvard pointed out that because of a continuing federal moratorium on the research, a whole medical procedure has been developed here and abroad with private funds and little research. This, he argued, should not be repeated with fetal tissue research. Panel chairman Adams shared that view. "Without federal funding, other efforts to continue research with human fetal tissue would undoubtedly proceed without federal supervision," Adams said. Better to do it with NIH oversight than without.

The fetal tissue panel, like similar bodies before it, was carefully populated with persons of diverse backgrounds and opinions. It included white, black, and Hispanic women, scientists, lawyers, and religious leaders, those who oppose abortion and those who support "freedom of choice." That its conclusions would be unanimous is asking the impossible. However, a majority opinion of 17 to 4 is seen as a strong consensus indeed.

NIH director Wyngaarden will now review the panel's report and transmit it to assistant secretary Windom on 9 January with the hope that the moratorium will be lifted so that NIH-funded research in this area can be developed.

■ BARBARA J. CULLITON

Budget Advice From the Academy

The President and Congress would see more clearly what should be done in U.S. science and technology if they could peer beyond the departmental agendas in Washington and focus on broad national trends. So say the nation's scientific elite in a plea for thinking big—specifically, in a report on the federal budget, released on 20 December by the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine.

According to these reviewers, the budget-writing process would be vastly improved if the top staff at the White House would take the initiative each year and set out broad goals for science and technology. Then, with the help of Congress, the budget could be adjusted to reflect how much money is available for progress toward each goal. The hope is that an approach like this would clear out some of the underbrush that makes the present system so confusing and do away with the impression that good connections are as important as good ideas. The authors also hope that those who get a low priority rank in this process would recognize that they had had a fair hearing, and would not try to make an end run.

Frank Press, president of the National Academy of Sciences, got this review started last May in a much-quoted speech on the need for setting priorities. If scientists would examine their own priorities more carefully, he said, they could give better advice to the government. Congress agreed. On 6 June it asked the Academy to suggest ways to improve the fragmented process that now produces the science and technology budget.

The government has "quite consistently supported" science and technology, the report says. But with big deficits looming in the 1990s, civilian science may fall under the knife as other nondefense programs did last year. The assumption of this report is that it would be better for scientific leaders to discuss the choices now rather than to wait until after they have been made. This view, endorsed by Press and 12 colleagues, "begins the public dialog," says a Senate budget aide.

The academicians conclude that no change is needed in the way federal departments draw up their internal scientific budgets, because mission-oriented R&D already works quite well. However, improvements are needed elsewhere, in less focused, multi-agency efforts. These need more examination, as follows:

■ **Infrastructure.** The President's science adviser and the Office of Management and Budget should collect data from all the agencies that pay for equipment, give basic research grants, or support technical education and training. In the President's special analysis of R&D funding, attention should be given to long-term goals for growth of this "science and technology base."

■ **Political Objectives.** Congress and the President get swept up in special crusades that require technical support. These specialized parts of the budget need coordination and tracking of a kind that can only be done by a central office such as the President's Office of Science and Technology Policy. Recent examples of programs that need this attention are efforts to improve superconductivity research, the drive to make U.S. industry more competitive, AIDS prevention and treatment, and biotechnology initiatives.

■ **Big Science.** This is another area in which coordination is needed because individual departments take a parochial view of their projects and may not be aware of the impacts they will have elsewhere on science and technology. Some examples cited are the superconducting supercollider, the space station, and the campaign to map the human genome. Reviews of these mammoth projects should document the quality of science or technology they aim to produce, the size of the capital investment, the commercial spinoffs that may develop, the opportunities for sharing costs among other agencies or nations, and the time-urgency (why now rather than later?).

■ **Appropriations** should be made for two years, not one, to reduce the amount of paperwork and lend stability to research.

■ **Military R&D.** The authors think that spending in this category is not comparable to civilian R&D because it is focused on testing specialized weapons. Perhaps $30 billion of the Pentagon's budget is specialized, Press says, and present reports on the budget may exaggerate the military's contribution to science and technology for this reason. The new administration should empanel a group of experts to look at this issue.

■ ELIOT MARSHALL