

free enterprise into research policy. He has already targeted the need to reduce bureaucratic controls over science and technology, and to substitute direct federal support for individual research projects with indirect measures that allow greater play to market forces. One proposal he is canvassing to meet both these objectives, for example, while increasing employment opportunities for young scientists, would be for the government to support small research-based companies engaged in transferring laboratory discoveries to the marketplace, a model directly based on the success of companies such as Cetus and Genentech.

At the same time, responding to the social criticism of science and its applications which has fueled support for

groups such as the Greens, Riesenhuber is stressing the importance of technology assessment. "In the past, technological advances have helped to overcome serious bottlenecks and indeed made it possible for us to achieve our prosperity," he says. "To derive benefits from technological innovations in the future, while also reducing the risks carried by each step forward, constitutes a permanent challenge."

The Social Democrats, also concerned about the possible loss of votes to the Greens—and the difficulties already experienced in Hamburg of bringing them into a coalition government—have taken up the same challenge but adopted a different approach. Rather than what they see as "top down" technology as-

essment, they are demanding more "social responsibility" in science, calling in their manifesto for steps to ensure that science and technology are "socially and environmentally acceptable."

"Either the public ultimately will decide to put restrictions on the development of science, or scientists will come to accept that freedom without responsibility should not be called freedom," says Meyer-Abich. He is proposing that the budgets of the nation's major research institutions be reduced by 1 percent a year if they cannot show that they are responding to social concerns.

Another subject on which the position of both parties reflects the impact of critics of science and technology is the question of fast breeders. Faced with a recent escalation in cost estimates for the Kalkar reactor from \$2.1 billion to \$2.7 billion, Riesenhuber and his colleagues are closely studying the economic future of the project and looking for ways of persuading an increasingly reluctant utility industry to share a major part of the cost increases.

The Social Democrats, who until losing power in October had consistently championed Kalkar, which they had initiated in the early 1970's, have now changed their minds (on the basis of reduced projections of future energy demand) at the prompting of the new party leader, Hans-Jochen Vogel. The SPD manifesto now clearly states that, if elected, the party will immediately stop the Kalkar project.

Other policy changes likely to be introduced if the SPD wins will be less dramatic. "To be realistic, I would not begin by reshaping the whole system," says Meyer-Abich, who is being tipped as a potential minister of research in a Vogel-headed coalition government with the Greens. "My idea is to plant seeds, to stimulate crystallization points for a new kind of research embracing social objectives that should be attractive to scientists in existing institutions."

The Christian Democrats, in contrast, are currently confident that German voters, frightened off by what author Robert Jungk describes as "the greening of socialism," will endorse a free enterprise view of the future, with policies governed, says Riesenhuber, "by the principles of competition of ideas and inventions." Meyer-Abich describes this as a return to the technocratic governments of the 1950's; Riesenhuber claims that "The government must allow the individual scientists and researcher more creative freedom if the general climate for research and innovation is to be improved."—**DAVID DICKSON**

## ARS Floats a Plan

The Agricultural Research Service (ARS) has developed a 6-year plan that goes some way toward meeting the many criticisms that have been heaped on the U.S. agricultural research system in recent years. Described by ARS administrator Terry Kinney as "the most significant planning activity that ARS has ever completed," it would begin to shift more of the ARS's \$420 million budget into basic research and reorder priorities among the agency's major programs.

The plan assumes that ARS's research budget will not grow in real terms during the next 6 years. Any growth in individual programs must therefore be funded by cutting back in lower priority areas—an approach that presidential science adviser George Keyworth has been pushing for all federal R & D programs. In general, the plan would increase support for research on human nutrition, postharvest technologies, and soil and water conservation, while reducing funding for work on plant and animal productivity. The latter two areas now account for 60 percent of the ARS research budget; in 6 years time, they would shrink to 52 percent.

Within each major program area, however, some programs would be increased while others would be reduced. For example, the plan calls for cuts in research on some individual insect pests and increases in support for more basic studies of insect biology. In the human nutrition area—which would grow from 7 percent to 10 percent of the total ARS budget—increases are provided for operation of a new \$32 million center at Tufts University.

By itself, the plan will not eliminate the inefficiencies and structural defects that critics have pointed to in the ARS's sprawling research empire. But its very existence may help the Department of Agriculture argue for politically difficult structural reforms, if it has the will to do so. "If we are going to have any change in the ARS, it must be in the context of a long-term plan," observes Denis J. Prager, an assistant director of the Office of Science and Technology Policy, who helped convene a critical review of the agricultural research system last year (*Science*, 24 September, p. 1227).

One structural reform urged by several observers is the closure of many underfunded ARS research institutes and the consolidation of programs in major centers. A General Accounting Office report published in January pointed out, for example, that the ARS operates 148 research facilities, many of which are used well below capacity. Several have fewer than 10 scientists. But whenever ARS moves to close a facility, the member of Congress in whose district it resides applies pressure to keep it open.

Now that ARS has developed a strategic plan for its research activities, the next, and politically more difficult, step is to develop a structural plan for its research facilities and sell it to Congress.—**COLIN NORMAN**