For U.S. Science Policy, It's Time for a Reality Check

By Richard E. Sclove

DOUG PAULIN FOR THE CHRONICLE

A report by the House Science Committee concentrates on the natural sciences and slights the social sciences. It ignores advances in computer design, telecommunications, biotechnology, transportation, and energy production.

ADVANCES in information technology, genetic engineering, and other technical fields are reshaping the world minute by minute. A year and a half ago, House Speaker Newt Gingrich announced an initiative to bring U.S. policy in line with those fast-moving developments. The Speaker asked the House Science Committee to develop "a new, sensible, coherent long-range science and technology policy," a charge that clearly went beyond the committee's usual jurisdictional boundaries. Aware that obsolete Cold War imperatives can no longer justify current federal research-and-development policies, Mr. Gingrich told the committee's members: "You give me a set of strategic investments . . . a mission large enough to mobilize the nation . . . and then make it my problem to go out and figure out how to find the money."

Invited to blast home-run number 62 over the centerfield wall, the House Science Committee has instead just bunted foul. Ignoring the Speaker's charge to be visionary, the committee released a report on September 24 that opts, in the document's own words, for timid "mid-course corrections" and "fine-tuning."

In his original charge to the committee, the Speaker referred to the report "Science: The Endless Frontier," prepared by President Roosevelt's wartime science adviser, Vannevar Bush, in 1945. Mr. Gingrich declared starkly that "the Vannevar Bush approach is no longer valid." The science committee's new report, however, reaffirms all the core elements in Bush's vision.

First, although Mr. Gingrich requested a new "science *and technology* policy," the committee emulates Vannevar Bush in focusing on federal support of basic research in the natural sciences. The committee's report does not examine or recommend any national policies governing technological advances in computer design, telecommunications, biotechnology, transportation, and energy production—all areas that have significant potential to transform our society. For example, depending on the policy environment governing the evolution of telecommunications systems, the Internet could foster the creation of neighborhood telecommuting centers that would help revitalize community life, or—through electronic commerce—it could sap revenue from local economies and thus weaken communities.

In concentrating on the natural sciences, moreover, the committee slights the social sciences, which one might have imagined would play an essential role in illuminating contemporary social issues.

Second, the committee reaffirms Vannevar Bush's insistence that scientists must have substantial autonomy in deciding which basic-research projects most deserve federal financial support. This would perpetuate the current system, which typically denies any meaningful role in science-and-technology decisions to those who pay for and are directly affected by research and innovation—that is, Americans in all walks of life.

During the Cold War, policy makers rationalized the exclusion of the public from discussions about research priorities by appealing to the supreme imperative of national security. Today, however, non-scientists already have won several battles to contribute to research decisions: For instance, AIDS activists have influenced the design of clinical trials of drugs to fight the disease, and women's organizations have redirected medical-research agendas to insure that women's health concerns are studied. We need more, rather than less, participation by the public and public-interest groups in policy making, given the magnitude of the potential changes in our lives that may be wrought—to take just one example—by advances in genetic testing and telecommunications that raise concerns about privacy.

Further, the committee insists that industry and market forces must remain the paramount players in deter-

mining which new products are introduced into our lives. The market certainly is an important mechanism through which consumers can vote for their preferences, and that is precisely why a decent portion of commercial innovation winds up scratching where we itch. Nonetheless, the market is hardly a perfect mediator between society's needs and the products or technologies that businesses decide to spend money to develop. As consumers, we can't vote for products that never are made available; for the types of energy, water-management, and other infrastructural systems that we would like industry to develop; or for products offered by the military for national defense. Nor can we vote on the social results—intended or not—that our individual purchases combine to produce.

To join science and innovation to the public good, we must seek ways of making the market more responsive to democratically decided priorities. Including representatives from public-interest, grassroots, and workers' groups on all government boards that advise on technology policy and regulations would be one step in the right direction.

If the House Science Committee seems determined to freeze U.S. science policy in a Cold War time warp, what does it see as the preeminent contemporary challenge for science and technology? Unraveling the mysteries of the cosmos? Curing dread diseases? Preventing nuclear proliferation, halting global warming, improving schools? No. The committee pronounces "the single most important challenge" confronting science and engineering to be bolstering popular support for the public financing of science.

Can it be that the committee believes that the most serious change in post–Cold War science policy should be in the realm of public relations? Rather than insuring that science and technology become responsive to pressing social and environmental concerns, this is a policy custom-designed to insure that Cold War–era institutions can conduct their business as usual.

The committee didn't get the message that it's time to tow the nation's science policy in for a 50-year reality check. For instance, military research and development represented a whopping 53 per cent of the federal research-and-development budget in fiscal 1998. That's greater than the 45- or 50-per-cent levels that prevailed even during the Vietnam War, at the height of the Cold War.

The United States currently spends more than $20-billion annually to support a vast network of government laboratories, some of the largest of which are Cold War relics widely acknowledged to be searching desperately for missions that would justify their continued existence. The committee does not recommend closing or even shrinking any of these anachronistic behemoths; it simply suggests continuing their federal financing while experimenting with privatizing their management.

Bolstering corporate welfare is prominent among the committee's concerns. For example, the committee proposes a permanent research-and-development tax credit for corporations. That recommendation ignores the most recent volume of the National Science Foundation's *Science and Engineering Indicators*, which shows that spending on applied industrial research jumped 30 per cent from 1993 through 1997, in constant dollars. Furthermore, the same report concludes that there is no evidence to prove that research-and-development tax credits produce net benefits to society.

After the Pentagon, the National Institutes of Health has the largest federal budget for research and development. The N.I.H. had a $13-billion budget for fiscal 1998, and Congress and the Administration both support dramatic increases in that budget over the next five years. The House Science Committee sensibly cautions Congress against permitting the current popularity of health research to overshadow other fields of research. But the committee's report does not address such basic questions as: Does the N.I.H.'s traditional interest in medical cures mean shortchanging efforts to prevent disease? Might that focus tend to increase health-care costs? Are the fruits of N.I.H. discoveries shared equitably among rich and poor Americans? When a widely cited 1993 *New England Journal of Medicine* article has shown that Americans make more visits to practitioners of unconventional medicine (such as acupuncturists, chiropractors, and homeopaths) than to primary-care physicians, why is less than two-tenths of 1 per cent of the N.I.H.'s budget devoted to research on alternative medicine?

To its credit, the committee does emphasize the importance of research on environmental problems. The panel is also deeply concerned with improving the public's understanding of science, but its report never mentions the urgent complementary need to improve understanding—among laypeople, government decision makers, and researchers alike—of the social impacts of science and technology, including the unplanned disadvantages as well as benefits. Indeed, although the committee declares that "the ramifications for society and for the environment of new technologies" require consideration, its report doesn't comment on Congress's rash 1995 decision to eliminate its own Office of Technology Assessment—the only agency in the federal government that routinely and systematically examined such ramifications. Why didn't the committee consider re-establishing some way to assess the social consequences of technology?

How could the committee labor so long and wind up so far out of touch? Committee members solicited advice from traditional luminaries of the scientific community, including leaders of the National Academies of Science and Engineering and of major government laboratories, along with representatives of various universities and industry groups, such as the Massachusetts Institute of Technology and the Chemical Industry Institute of Toxicology.

But the committee left representatives of the other constituencies directly affected by U.S. science policy out in the cold. It did not invite testimony from a single representative of an environmental, civil-rights, or women's organization. The committee also ignored groups involved in occupational health or defense conversion. And it heard from no one representing local governments. That is hardly a socially responsible approach to a post–Cold War science-and-technology policy.

While U.S. policies toward science and technology remain mired in the past, other countries are racing ahead to make science and technology within their borders more socially responsive. Non-scientists make up a majority of the Swedish government's Council for Planning and Coordination of Research, which is noted for promoting innovative programs of interdisciplinary research. Japan and European nations such as Germany have pioneered processes that foster collaboration between industrial engineers, university scientists, workers, and end-users in developing new technologies.

For a decade, the Danish government has appointed panels of everyday citizens to cross-examine a range of experts and other interested parties—such as representatives of industry, labor, and consumer groups—and then to deliberate on what they've heard and announce non-binding recommendations for science-and-technology policy at a national press conference. As an example, a 1989 Danish citizens' panel on the social implications of the Human Genome Project endorsed the experts' support for basic genetic research, but the panel called for more research on the interplay between environmental factors and genetic inheritance, and on the social consequences of science. It also influenced the Danish Parliament to prohibit the use of information from genetic tests in employment and insurance decisions.

The Danes' carefully structured participatory process is already being emulated in other countries, including France, Japan, the Netherlands, Switzerland, and the United Kingdom. A pilot demonstration of the process took place in the greater Boston area in April 1997 on the topic of telecommunications and the future of democracy.

When a broader range of citizens participates in making decisions about science and technology, the public is more likely to accept those decisions. For example, after the Danish government sponsored several citizens' panels and hundreds of local debates on biotechnology, a study by the European Commission in 1991 found that more Danes understood and supported their national biotechnology policies than citizens of other European countries. Industry also can benefit when the public participates, by learning about and being able to address popular objections early in the process of developing new products.

In the United States, various federal agencies have set up small programs to support collaborations between university researchers and community groups. For example, the Childhood Cancer Research Institute, affiliated with Clark University, has received funds from several federal agencies, including the National Institute of Environmental Health Sciences. The cancer-research institute has used those grants to work with several American Indian tribes to study the health effects of exposure to nuclear radiation.

Although academics who have conducted research with members of the public report challenges in negotiating research timetables, cultural differences, and power disparities with their lay colleagues, the scholars often say they believe that the collaboration improves the quality of their research. It also gives them the tremendous satisfaction of seeing their work directly address people's urgent needs.

A recent study by my own non-profit organization, the Loka Institute (http://www.loka.org), estimates that for about $450-million per year—less than one-quarter of 1 per cent of the total U.S. expenditure, both public and private, on research and development—the United States could expand such small programs into a decentralized national network of community-research centers. By responding to the concerns of grassroots and public-interest groups and local governments, such a network would, in effect, assist the national laboratory system in fulfilling its core obligation—to conduct research that is in the public interest, but that existing university, business, and government research facilities will not perform or could not do well.

Deliberative citizens' panels on science-and-technology policy, lay participation in the design of new technologies, and community-based research exemplify the type of creative changes required in the post–Cold War period. Until members of Congress and senior scientists permit other Americans to join their chummy policy dialogues, we should not be surprised when citizens begin telling their elected representatives to "just say no" to paying for the status quo.

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