Evgenii Velikhov agrees: "The [academy] institutes will fight to keep their budgets."

Previous attempts to establish granting systems within the academy or universities have almost always been unsuccessful, say Bendookidze and others. "We referees just gave all the money to each other," he confesses. The committee hopes to solve this problem, says Nikolaev, by using as many reviewers as possible from outside Russia. Already, he says, he has been overwhelmed by offers from U.S. professors to help. But he still fears that the foundation, which like the academy has no budget yet for 1992, will remain "just a name on a bank account."

With or without the foundation, recovery for Soviet science will be, at best, slow and painful. Says high-energy physicist Sergei Kapitsa of Moscow's Institute for Physical Problems, "It took the Germans and the Japanese 20 years after the war to begin to build fine motorcars, and 20 years after that to become scientific powers."

Many researchers, however, fear something worse than a decades-long climb out of the morass: a collapse of the democracy movement and a return to totalitarianism. "People who are calling themselves 'democrats' are using the methods of the Bolsheviks," says Smirnov, who has taken to carrying a gas pistol [air gun] since receiving anonymous threats to stay out of Russian politics. Freedom, Skulachev adds, may turn out to be a dangerous commodity, primarily because in a country with no history of liberal, constitutional government, people do not know how to use it. "In a sense," says Skulachev, "we are still slaves in our mentality despite our new freedom. This is why the wrong people may come to power very easily." But for scientists, there is at the moment no choice but to tie their fortunes to those of Yeltsin and Russia and hope for the best. Should Yeltsin falter, the present problems of science may seem small indeed. ■ STEVEN DICKMAN

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AAAS to Explore Assistance

At a meeting last week, the AAAS board of directors decided to explore ways the association could assist researchers in the former Soviet Union. As a first step, the board is hoping to collect data on the status of research institutes and individual scientists, perhaps with a view to sending teams to the various republics over the next year or so. Information from any contacts within the former USSR will be coordinated by Sandra Burns, at the AAAS USSR Program.

Breast Cancer: Stalemate In the War on Cancer

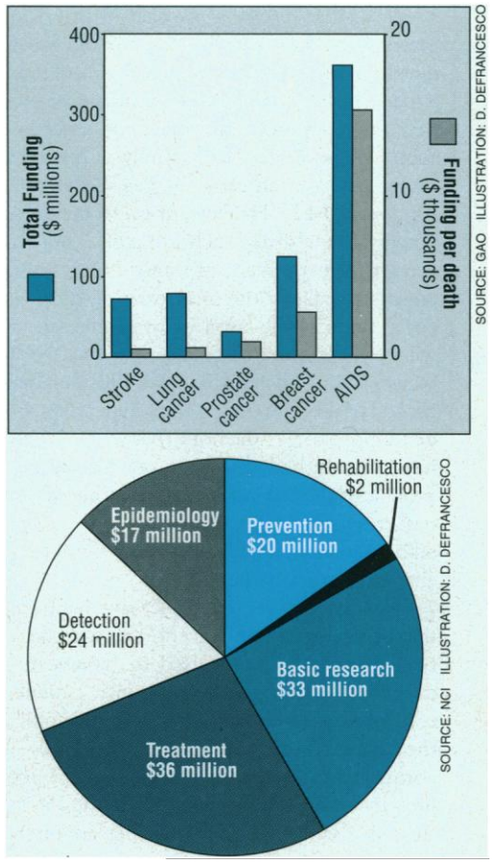
A GAO report documents new research and better treatments for breast cancer, but incidence and mortality are rising

EVEN THE LEADERS OF THE WAR ON CANCER seemed subdued last week as they surveyed the battlefield. Twenty years after the big push to find "magic bullet" cures began with the signing of the National Cancer Act, they were called up to Capitol Hill by Representative Ted Weiss (D–NY) to explain why the incidence of the most common cancer among women, breast cancer, has increased over the past few decades.

What emerged from the hearing was a saga of substantial investments—the National Cancer Institute (NCI) has spent more than $1 billion on breast cancer alone over the past two decades—and spectacular progress at the research level, but limited success in the area that counts most: reducing mortality. According to NCI, 26.9 women out of every 100,000 died of breast cancer in 1973; by 1988, the number had grown to 27.5 per 100,000, and the trend seems to be heading upward. The rising incidence of the disease led several witnesses at the hearing to question NCI's focus on treating the disease rather than finding ways to prevent it.

In many respects, what's happening in breast cancer is an extreme example of the way the War on Cancer is going in general. After spending $22 billion in the past two decades, NCI can point to a wealth of new research findings, better treatments, a dramatic reduction in deaths from less common childhood cancers, and significant improvement in survival times for cancer patients under age 65. But overall death rates from many common cancers remain stubbornly unchanged—or even higher than when the war began. Only a few years ago, NCI leaders were setting super-optimistic goals, such as aiming to reduce the cancer death rate within the next decade by 50%. Now, reflecting a new touch of realism, that target has been dropped from NCI literature.

This represents a "very sharp change from 5 years ago," says John Bailar III, a former NCI biostatistician who was one of the first to challenge what he calls "the cancer establishment" about the slow rate of progress. When he published a statistical analysis in 1986 pointing out that people had been dying of cancer at the same rate for nearly two decades, the response from NCI leaders was "absolute rage," says Bailar. But much, including the leadership, has since changed.



Funding snapshot. *Breast cancer ranks below AIDS in 1990 NIH extramural research* (top)*; most 1992 NCI funding for breast cancer will go to treatment.*

Bailar's message got some support from General Accounting Office (GAO) experts who testified at the Weiss hearing on breast cancer last week. In the fifth of a series of reports on the cancer program, GAO found that "the likelihood is increasing that any woman will be diagnosed with breast cancer in her lifetime," and "we must conclude that there has been no progress in preventing the disease." Treatment has improved the chances of surviving, but only slightly. From 1976 to 1983, the 5-year survival rate for breast cancer patients increased from 74% to 77%. NCI's spending on breast cancer has brought some improvement, but "progress is in the eye of the beholder," says George Silberman, one of the authors of the GAO

study. "We have done well" in developing a basic understanding of the biological processes that lead to cancer, and in providing better care for patients, he adds.

At the Weiss hearing, National Institutes of Health director Bernadine Healy picked up on that theme, describing the "superb basic research" on breast cancer funded by NIH. Healy pointed out that funding for breast cancer research since 1985 has been growing faster than the total NCI budget. Much of that research, she said, focuses on genes that appear to affect the rate of cancer development—the *p53* tumor suppressor gene, which is often defective in cancer patients and a genetic abnormality on chromosome 17 associated with family clusters of breast cancer at an early age (see *Science*, 9 August, p. 612). Healy went on to mention potential new drugs such as taxol, a potent extract from the bark of a rare Pacific yew, which she called "the most exciting drug to come along in the last 15 years." She said it will be tested on breast cancer patients. NCI is also about to launch a 16,000-member clinical trial of the drug Tamoxifen, an estrogen suppressor, in the hope that women who have already had cancer in one breast can avoid it in the second. Although none of the basic research has yet put a dent in the mortality statistics, there have been significant changes in cancer therapy.

One big improvement, GAO says, has been the medical community's effort to scale back the severity of surgery used to remove tumors, and a new attempt to give patients control over their own therapy. For example, the use of radical or Halsted mastectomies—commonplace in the 1950s—was "not present" in the hospital charts from the 1990s the GAO sampled, indicating they are rarely used now. Surgeons are likely to use more limited "lumpectomies" and, in recent years, combinations of surgery plus some form of chemo- or hormone therapy. The report concludes that "breast cancer patients are treated better than they were, but it is not clear that they are treated more effectively." The GAO concludes that the quality of life for cancer patients has improved because "the management of the disease has improved."

There's even more uncertainty about why the incidence of the disease is rising. The statistics are alarming: A U.S. woman's chances of becoming a breast cancer patient are now double what they were in 1940. Or, as patient rights advocate Ruth Spear said at the hearing: "It is inconceivable to me that my daughters should have a higher risk of developing breast cancer than their grandmothers." (Yet, at the same time, their chances of dying of heart disease have declined.) One reason for the increase in breast cancer risk, Healy said, is the improved screening, which detects slow-growing tumors at an early stage. But she added that "some of the increase cannot be explained."

This led several witnesses to argue that the government should shift the emphasis of funding for breast cancer research toward prevention. Devra Davis, scholar in residence at the National Academy of Sciences, noted that only 30% of breast cancer cases are now linked to identifiable causes. And most of these have to do with diet or genes. "Clearly there are environmental factors, broadly conceived, that are involved" in triggering the disease, Davis said. She cited two recent studies, one from Israel and the other from Vermont, suggesting that women with breast cancer may have been exposed to more toxic chemicals than cancer-free controls. Davis' general message was that more funding should go to finding potential carcinogens in the environment.

The commanding general in the War on Cancer, NCI director Samuel Broder, agreed with the logic but said the agency has already completed or is planning "well-designed studies" on the chemical 2,4-D, on potent amines, and on polycyclic hydrocarbons. And Healy reminded the audience that she is organizing a large (140,000 strong) study of women's health that will examine the effects of diet, artificial hormones, and vitamins on cancer, heart disease, osteoporosis, and stroke. The "enormity of the breast cancer problem," Healy said, was one of the things that prompted her to ask for the study.

While NIH is gearing up for a more vigorous attack on breast cancer, there are still no magic bullets in sight. As the GAO's Silberman put it, "Nowhere in the pipeline is there any drug that is going to transform the situation dramatically." The same, unfortunately, is true for most other common cancers 20 years after the government declared war on the disease. ■ ELIOT MARSHALL

Canadian Biotech Regs Under Fire

For years Canadian industry has complained that regulations governing the introduction of new biotechnology products are cumbersome. Indeed, some critics charge that Canadian regulations are a decade behind those in the United States—and that Canadian industry suffers as a result. Another example of special pleading by a regulated industry? Not according to a government report issued last month by the National Biotechnology Advisory Committee (NBAC), which reports directly to the minister of science. It concludes that current delays and regulatory uncertainties are discouraging new research and investments in commercial facilities, driving up the costs of innovation, and undermining public confidence in biotechnology.

Take pharmaceuticals. Due to a lack of expertise and staff reductions at the federal ministry that is responsible for biopharmaceuticals, approvals are slow: They can take from 1 to 3 years. According to the report, Health and Welfare Canada should give "urgent priority to increasing the number of professionals and technical personnel committed to assessing new biopharmaceuticals," and regulations should be "harmonized" with those of other countries.

One way to shortcut the approval process, the report says, is to cut out duplication of clinical trials that have already been held in the United States. "Standardize and simplify those regulations pertaining to the licensing of product, so you don't have to repeat again all of the clinical studies, at least for Canada and the U.S.," says NBAC chairperson William Cochrane, an Alberta-based venture capital consultant who spent 11 years as the chief executive officer of the large Toronto-based biotech firm Connaught Labs.

The report also complains that regulations governing the 100 or so field tests of genetically altered plants conducted in Canada since 1988 are antiquated and confusing, while in other areas regulations are nonexistent. Genetically altered microbes for bioremediation, for instance, fall outside existing legislation, which means that companies are unwilling to get into this business because businesses are unwilling to invest in an uncertain regulatory environment. Environment Canada has authority to regulate such organisms under the 1988 Canadian Environmental Protection Act, but it is still developing the rules.

In spite of the report's tone, all is not lost for Canadian biotech, says Terry Walker, special adviser for biotechnology regulations in the federal ministry of Industry, Science, and Technology Canada. Walker argues that the process of implementing and streamlining regulations is already under way, including consultations with corresponding U.S. departments, between Canadian levels of government, and between departments. Adds William Winegard, Canada's minister for science: "We have the brains, now let's get rid of the barriers." ■ DOUGLAS POWELL

Douglas Powell works for the Information Technology Research Center at the University of Waterloo.

* "A National Biotechnology Business Strategy: Capturing Competitive Advantage for Canada," released November 25, 1991.