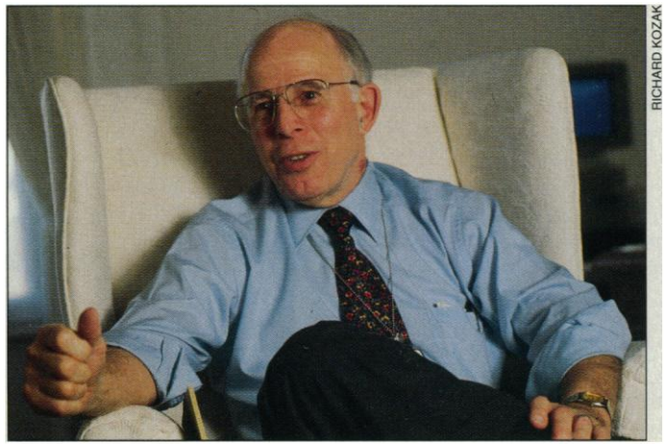
Clinton Moves to Manage Science

A new way of looking at the R&D budget and a new, high-powered council seek to tie government expenditures on science to national needs

Science policy was never a major plank in Bill Clinton's campaign for the presidency; any mention of it usually came as part of a promise to stimulate the economy and create jobs. Nine months into his administration, jobs and the economy are still paramount, but now there's been time to think about science, too. The result? In the past month, the White House has taken two significant steps toward realigning the nation's $76 billion R&D budget in an attempt to wrench federal spending away from its cold war roots. And although the details are fuzzy, one thing is already clear: John Gibbons, Clinton's science adviser and head of the Office of Science and Technology Policy (OSTP), is playing a major role in the realignment with the backing of Vice President Al Gore, Clinton's point man on technology.

Gibbons took office promising to carry out the president's wish to bring R&D spending more in line with a set of defined national needs that emphasize domestic areas such as manufacturing, telecommunications, and the environment. The first step in that direction emerged in a 17 August memo from Gibbons and Leon Panetta, director of the Office of Management and Budget (OMB), to the heads of each Cabinet department and agency. The five-page memo, which has been obtained by *Science*, orders agencies to abolish the traditional method of dividing research into basic, applied, and development. "While these categories have some utility," Gibbons and Panetta write, "they provide little information about the relevance of these investments to society." Three weeks later, the White House made its second move with the publication of Gore's blueprint for "reinventing government," which included a proposal for establishing a National Council on Science and Technology to plan and coordinate the government's R&D programs (*Science*, 17 September, p. 1513).

Henceforth—possibly in time for the budgets now being prepared for fiscal year 1995—research agencies are to divide their spending into 10 mutually exclusive categories. Nine address specific societal concerns, ranging from manufacturing, communications, and education and training to the environment, health, and national security. The tenth is a grab-bag account labeled "other R&D."



RICHARD KOZAK

In the loop. John Gibbons is working with Vice President Al Gore to redefine the government's $76 million R&D budget.

The change may seem like a make-work project for government bookkeepers, but don't be fooled: The real intent is to draw an accurate picture of what the government is doing with its research dollars as a prerequisite for making decisions on how to reallocate some of those dollars. In an interview with *Science*, Gibbons explained the rationale behind the memo. "I spent 15 years doing research that I could either label 'basic' or 'applied,' so those two buckets don't tell me anything," says Gibbons, who was a physicist at Oak Ridge National Laboratory and the University of Tennessee before becoming director of the congressional Office of Technology Assessment in 1979. "Our goal...is to classify this stuff in a way that more accurately represents where our resources are going. Then we can lay them up against our goals and ask, 'Does the S&T budget reflect the kinds of priorities that it is meant to support, namely, the president's overarching national goals?' " For example, Gibbons says that a chart of the federal R&D portfolio shows big spikes for defense, space, and weapons-related energy research and much smaller amounts for civilian agencies. "Is that a reflection of national needs?" Gibbons asks rhetorically.

One skeptic, Robert Grady, former deputy director of OMB, has a darker view of Clinton's intent, however. "My fear is that [the reclassification] is window-dressing to obscure the fact that Clinton promised big increases in the R&D budget but failed to deliver on that promise," says Grady, now an investment banker in San Francisco.

Where does basic research fit in? The simple answer: Nobody knows. An earlier draft of the 17 August memo listed basic research as one of 11 categories, but it disappeared as a separate entity in the final version. To be sure, "vigorous support for basic research" is listed elsewhere in the memo as one of the Administration's eight R&D priorities. (The others are communications technologies, advanced manufacturing technologies, more fuel-efficient cars, education and training technologies, restructuring national labs, making federal buildings more energy-efficient, and making government work better.) And Gibbons says that "other R&D," in his mind, "means any curiosity-driven research that does not defensibly and convincingly belong in these other areas." A large part of the budgets for the National Science Foundation (NSF) and the National Institutes of Health (NIH), he adds, would fit into that category.

In spite of such assurances, some observers are still wary. H. Guyford Stever, a former NSF director and science adviser to President Ford, says, "The real test is whether, as a result of this reclassification, funding for individual investigators takes a hit" in future budgets. "It's possible to use this realignment to clobber basic research, but I don't think that will happen in this Administration."

Gibbons responds to such concerns by noting that the president's selection of Nobelist Harold Varmus to lead NIH and Rice University provost Neal Lane to head NSF—two scientists who have spent most of their careers in basic research—"sends a sig-

SPECIAL NEWS REPORTS

Science's third annual report on careers in science begins on page 1765, and Part II of a special news report on the National Institutes of Health begins on page 1674. News & Comment and Research News are combined into a single section for this issue.

nal [to the scientific community] that we attach great value and importance to research that does not have to be justified on the basis of its relevance to some application." At the same time, he wants scientists to know that the Administration is not planning to write them a blank check. "When you get into big bucks," he says, "curiosity-driven research has to meet additional criteria," such as serving other national goals, if it hopes to be funded. "That's the issue with the Superconducting Super Collider and the space station."

Gibbons says the new system will clarify what the government spends on basic research, even if it is to be called by other names. The figure of $14 billion contained in the president's 1994 budget request "is probably in the ballpark," he says, adding, "but I'm not sure that the way it's being spent is optimal. Have we ever looked at that figure? Should it be be five times bigger or three times smaller? Before you can answer those questions, you need to have confidence in the numbers. And right now I don't."

Once the Administration has confidence in the numbers, the next step—linking expenditures to national needs—will require tighter management of the budget. That's where the National Science and Technology Council comes in. Clinton this month approved the formation of the panel proposed in Gore's report and gave it authority to see that the Administration's R&D priorities are mirrored in the budgets of individual agencies.

The new council will oversee science policy in the same way the National Security Council and the National Economic Council coordinate those sectors. Gibbons says the council will "have great powers of persuasion" as individual agencies begin to develop an R&D budget each year and that it will operate "in parallel" with preliminary discussions between each agency and OMB. The goal, says Gibbons, is to reach "agreement on major areas" of R&D spending before each agency submits its budget to the White House. This would represent a big change from the traditional way of doing things, in which the departments and agencies make their own individual pitches to OMB.

Gibbons says he hopes the council will be up and running by January, in time to begin reviewing what will eventually become the president's 1996 budget request to Congress. Its membership is expected to include Cabinet secretaries and agency heads, with Clinton as its chairman and Gore as its vice chairman. Much of the actual work will be carried out by officials at the various science agencies, he says, and the president would attend meetings "as needed."

One result of the new accounting methods and administrative structures will be more central control over the R&D enterprise. Asked whether this arrangement is a move toward establishing a Department of Science and Technology, Gibbons grins. "Heavens, no," he says. "This is in lieu of one. It's a virtual department."

–Jeffrey Mervis

AUTOIMMUNE DISEASES

Treating Arthritis With Tolerance

Autoimmune diseases are biological betrayals: the body's own immune system, which is supposed to protect it against infection, instead turns traitor for unknown reasons, attacking apparently normal tissues. These acts of treason can take many forms. One of the more common is rheumatoid arthritis (RA), in which the joints become painful and swollen under immune system assault. RA symptoms can be relieved somewhat by suppressing the assault with steroid drugs or drugs that block cell proliferation. But these treatments carry the risk of serious side effects such as accelerated bone loss, cataracts, and liver damage.

Now an apparently less toxic RA treatment may be on the horizon. On page 1727, Harvard rheumatologist David Trentham and his colleagues report they have significantly reduced RA patients' symptoms by feeding them type II collagen, a protein common in joint cartilage and a possible target of the autoimmune attack in RA. The Harvard group's approach, called oral tolerization, takes advantage of a trick used by the body to prevent immune reactions to the foods we eat: Foreign proteins that enter the body through the digestive system suppress immune responses to those proteins instead of triggering them. Oral tolerization attempts to reduce autoimmune attacks by feeding the patients proteins—collagen, in this case—that are found at the site of autoimmune disease and that may have triggered the autoimmunity in the first place.

When the approach was first tried in humans, patients suffering from multiple sclerosis were fed preparations of the brain substance myelin (*Science*, 26 February 1993, p. 1263) and showed some improvement, although the results were not statistically significant. But the RA results are more dramatic, and the study has been met with cautious enthusiasm by researchers who study autoimmunity. "It's reason for optimism that we're on the right track," says Howard Dickler, chief of the immunology branch at the National Institute of Allergy and Infectious Diseases. The caution, however, is prompted by a shortcut in the study design that may have exaggerated the results, and most researchers urge skepticism until larger studies confirm the findings.

In addition to Trentham, the team that conducted the RA study included Howard Weiner and David Hafler, the Harvard immunologists who directed the multiple sclerosis trial. Sixty RA patients participated in the trial, which was sponsored by Auto-Immune, a Lexington, Massachusetts, biotech company founded in 1988 to commercialize oral tolerization based on the results of animal studies conducted by Weiner. After stopping other arthritis treatments, half of the patients took daily liquid doses of chicken collagen for 3 months while the other half received placebos. Neither the patients nor their physicians knew which treatment the patients received.

The patients were examined periodically and when the study was completed, those who had taken collagen had a 25% to 30% reduction in observed swelling and pain in their joints, while the condition of patients in the placebo group had worsened slightly. Four of the patients receiving collagen had improved so much that their disease seemed to be in remission.

D. TRENTHAM

Arthritic attack. This rat joint shows damage to bone *(dark red)* and cartilage *(pink)* possibly caused by immune cells assaulting collagen protein in the cartilage.

Just how oral collagen produces such results is something of a mystery. Weiner found that feeding collagen to rats triggers the production of suppressor T cells. These cells travel to the joints, where collagen is found, and there prevent other types of T cells from mounting an attack and causing inflammation. But