Technology Policy, the General Accounting Office, and the Office of Technology Assessment—was that things on the nutrition research scene, especially in light of the new programs getting under way at USDA, were at best fragmented, at worst chaotic. Each report recommended some type of government-wide coordination, if not consolidation, of human nutrition research. That has not yet come to pass. Yet a start was made at NIH in June 1975 when the nutrition coordinating committee was set up to strengthen cooperation between the 11 institutes. At first the committee packed little punch. But since May 1977 it has reported directly to the director of NIH, Donald Fredrickson. In September 1978, USDA set up the new position of nutrition coordinator. In this job, Audrey Cross, a lawyer and nutrition consultant, coordinates human nutrition activities within USDA. There is now also legislation on the books that demands more cooperation between departments, especially between the USDA centers at Tufts and Baylor, and the NIH institutes with similar missions.

Though most everyone now pays lip service to interagency cooperation, behind the scenes there still seems to be a frantic rush at empire building. Take nutrition status monitoring. This measures a population's use of food. In individuals, it checks weight, height, and changes over time. On a biochemical level, it measures the metabolism of nutrients. It sounds routine, but getting an accurate idea of what people eat and what food does to them has been difficult in the past. Now, as the war over what people ought to eat intensifies, the need for this information is becoming crucial. At NIH, 7 of the 11 institutes are developing programs to do research on the methodology of nutrition status monitoring. And what of USDA? One day recently, Artemis Simopoulous was meeting with USDA officials when, in passing, one of them mentioned that USDA was thinking of acquiring a center for research into status monitoring. Simopoulos recoiled and said no, it was not necessary. NIH already had the field covered. The USDA official laughed. There was nothing Simopoulos could do. Coordination, at an NIH level or even for the HEW nutrition coordinator, only affects in-house policy. Coordination on a government-wide level is still, for all intents and purposes, a pipe dream. The upshot is that USDA is now making a bid for the Letterman Army Institute for Research (LAIR) in San Francisco. LAIR is already exploring techniques in nutrition status monitoring. Built in 1972 and now worth about $60 million, it has 20 lead scientists and 50 junior researchers. Says James Scheuer of the House Committee on Science and Technology: "It is generally agreed that the research techniques developed by the LAIR staff are unparalleled at any other nutrition research center."

As USDA scrambles to pick up new programs, it is also pushing hard on another issue—one that from NIH's point of view is perhaps the biggest headache of all. It is education of the consumer. USDA seems intent on a radical revision of the American diet, a la *Dietary Goals*. NIH is skeptical and wants to research the scientific merit of the *Goals*. A joint USDA-HEW task force is nevertheless trying to hammer out a series of dietary guidelines, at which point a government-wide nutrition education policy, aimed at prevention of "the killer diseases," would go into effect. But if the intensity of the turf war and the lack of coordination in other areas are any indication, a meeting of the minds on that issue seems rather far off.—WILLIAM J. BROAD

A New and Searching Look at NSF

Brown subcommittee opens year-long inquiry; witnesses say the agency is increasingly bureaucratic and seeks "sure bets" in making grants

The National Science Foundation (NSF), created three decades ago as the federal agency charged with the responsibility of supporting basic research, was given generally high marks on its performance by scientists testifying recently before the House Subcommittee on Science, Research, and Technology. But these witnesses saw actual or potential problems, as in signs of too much conservatism or "playing it safe" by NSF in evaluating grant proposals, and too few intellectual ties—which NSF was urged to foster—between university and industrial laboratories.

The subcommittee held hearings on 16 and 17 May to begin a broad review of the National Science Foundation Act (NSFA) of 1950. This inquiry will continue for about a year and include several sets of hearings. In an opening statement, Representative George E. Brown (D-Calif.), chairman of the subcommittee, said, "We want to take a new and searching look at questions that are fundamental to how the science foundation is structured and how its mission is defined, planned, and carried out."

Richard C. Atkinson, NSF's director and a lead-off witness, said that the NSFA had proved sound and that NSF had been "remarkably effective" in supporting basic science. Although nobody seemed disposed to disagree with this reassuring self-appraisal, criticisms were voiced to which Atkinson and other NSF officials no doubt will have to respond later in the inquiry.

Carl Leopold, plant physiologist at the Boyce Thompson Institute at Cornell University (and an aide to Guyford Stever when he was director of NSF), and Thomas F. Jones, Jr., vice president for research at the Massachusetts Institute of Technology, both expressed concern that grant proposals that are truly innovative and outside the mainstream often go unfunded.

According to Leopold, NSF program directors are constrained to support "conservative proposals, and proposals which are 'sure bets' in that they are most liable to provide some definable product in a short period of time." As for Jones, he said the peer review process discriminates against new interdisciplinary science and scientific thinking that is not "au courant" even though creative and ripe with "unusual possibilities for breakthroughs."

Leopold attributed this undue conservatism in grant-making to the "imposition of increasingly bureaucratic regulation." NSF programs, he said, are under pressure "to show that they have supported maximal numbers of pro-

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posals which have paid off with evident successes." With available dollars used to support research projects for "very short intervals" and at insufficient levels, NSF programs are "under pressure not to take 'longer shots' on more imaginative or longer-term projects, especially if a reviewer has given the proposal poor marks," Leopold added.

Al Murray, the subcommittee staff member in charge of the inquiry, told *Science* that the problem described by Leopold and Jones is very real. Although not sure what, if anything, Congress could do about the problem, Murray thinks the subcommittee should explore a suggestion by Jones that unusually capable scientists be funded for 5 to 10 years at a time so as to relieve them of what Jones called "short-term scoreboards."

But Leopold said that Congress has itself impaired NSF's ability to support basic science, as for instance by insisting that the agency support research in such applied areas as appropriate technology, power transmission from satellites, and problems of the disabled. "While each [such demand] may have merit by itself, they collectively . . . can impair the mission effectiveness of NSF," he said.

Another witness, Philip Handler, president of the National Academy of Sciences and a former chairman of the National Science Board at NSF, complained of "egalitarian pressures" on NSF to spread out its funds instead of supporting research strictly on merit. This is the situation as Handler sees it:

> The political emphasis on geographical distribution in the support of research has occasioned support of modest research activities in a great number of the nation's smaller colleges and universities. A substantial fraction of the funds appropriated to the foundation for the support of research has been so managed as to find its way to as many as possible of the 435 congressional districts containing more than 1000 colleges and universities in each of which there are departments of biology, physics, chemistry, mathematics, etc. Please understand that, in the doing, the operation is not nearly as crass as I made that sound. All grants have been awarded on the basis of peer review. Be assured that the nonsensical, the trivial, and the utterly pedestrian have rarely been supported, and never knowingly.

Handler said that, in the main, such activity has not contributed much directly to the growth of scientific knowledge. "Its value must be judged," he said, "for its contribution to the quality of science education in such colleges, by its effectiveness in keeping alive the intellectual interests of the faculty and . . . its success in attracting undergraduate students into careers in science. Accordingly, I could wish that such activities were supported—as they certainly should be—from a program understood to be valued expressly for its contribution to science education and managed as a program apart."

Jones spoke similarly, and said that science and science education must be strengthened in schools and colleges across the country if the nation is to get the benefit of its most talented students. "Our people are more statebound than is generally recognized," he said. Jones applauded NSF's recent experimental initiative aimed at encouraging a limited number of states to prepare plans for making scientists in those states better able to compete for research grants.

(NSF's science education program, for which Congress is expected to authorize about $86 million for fiscal 1980, has suffered a drastic decline over the last 10 years with respect to its relative position and status within NSF. While growth of a number of other programs has been dramatic, the current science education budget of about $80 million is only 60 percent of what the budget was when at its peak in the late 1960's.)

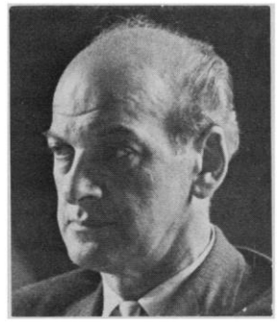
A major concern of Representative Brown—and of some of the scientists who testified, Handler and Jones in particular—is for the United States not only to maintain its lead in basic research but to exploit that lead far more effectively than at present through industrial applications. Handler noted that the success of German and Japanese industry is due in part to "effective marriages of university and industrial laboratories." He then observed: "There are many barriers to such arrangements in our country, and I hope that the Congress will strongly encourage NSF to experiment with alternative arrangements which might break down those barriers without damage to the integrity of the university while avoiding direct federal subsidy of industrial research."

Jones was of the same view, but pointed to some of the difficulties involved that must be overcome. "Industry and universities have always had an arm's length, mutually supportive relationship," he said. "But when efforts are made to tie them closer, tense and involved negotiations almost invariably ensue. Many industries which give significant general financial support of universities will draw lines and fight bitterly over conditions of a research contract."

Jones added that the conflicts turn on such questions as ownership of intellectual property (patents and copyrights) and publication of research that industry regards as proprietary. "NSF, as a broker willing to make an investment as well as to intermediate, can play an almost unique role in getting universities and industries over the hurdles," he said. "Another way of achieving the same ends would be by providing tax benefits to industries sponsoring basic research in universities. But this seems to be an idea that has not quite arrived."

Carl Leopold

Photo by L. J. Carter



Philip Handler

As chairman of the science and research subcommittee, Brown is faced with the task each year of justifying NSF funding authorizations to his House colleagues. A major part of the rationale for government support of basic research has been that such research often leads, sooner or later, directly or indirectly, to industrial innovation and gains in productivity.

By his comments during the hearing, Brown made it plain that this rationale could use some shoring up. An increased effort by NSF to see that no time is lost in having new scientific knowledge put to industrial use might help, he suggested for example.—LUTHER J. CARTER

Deborah Shapley has begun a leave of absence from *Science* to prepare a study of Antarctica as a foreign policy problem for the United States, sponsored by the Carnegie Endowment for International Peace. She is expected to return early next year.