ments cited, whereas afterward, the Europeans collectively accounted for about this proportion. The change was presumably brought about by the opening of a $95-million facility in Grenoble, France, in 1972.

The Institut Laue-Langevin is jointly supported by France, West Germany, and the United Kingdom. These three nations provided the Grenoble neutron facility with about $41 million last year as compared to the *total* U.S. spending on neutron scattering research of approximately $20.5 million. When all neutron scattering expenditures in the three European nations was totaled, the panel found that they were spending at the rate of $95 million per year, almost four and a half times the U.S. rate. Brinkman told *Science* that the United States has been keeping up by being clever, but this will not work forever. There is already a noticeable reduction in the flow of researchers from overseas wanting to use U.S. neutron scattering facilities. They are going where the money is.

Why should anybody mourn the loss of leadership in neutron scattering? The argument, in the recent DOE report and in a 1977 National Academy of Sciences study, is that neutrons provide a unique tool for exploring properties of matter that other techniques cannot easily probe.

Neutron scattering experiments roughly divide into two classes, according to whether the neutrons do or do not lose energy as they pass through a sample. The first case is called inelastic scattering and the second elastic scattering. Techniques based on inelastic scattering provide spectroscopic information about the energy states associated with such phenomena as vibrations and magnetic interactions in solids. Elastic scattering gives structural details about the arrangements of atoms in materials. One form of elastic neutron scattering, for example, is neutron crystallography, which is entirely analogous to x-ray crystallography. Another kind of elastic neutron scattering is small angle scattering, which gives structural information about disordered, partially ordered, or ordered materials with very large periodicities.

Two characteristics of neutrons have made neutron scattering especially useful. The first is that, in contrast to x-rays, neutrons easily penetrate solids made of heavy elements but are strongly scattered by hydrogen and its isotopes. This feature has allowed chemists and biologists to study the structure of polymers and biological macromolecules. The second characteristic is the small magnetic moment of the neutron, which allows the

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Most Additives Are Harmless

In a message of solace to consumers and industry alike, the Food and Drug Administration (FDA) has concluded that most common food additives are harmless. A review of 415 natural and artificial additives generally regarded as safe turned up few surprises. Only salt was targeted for restriction or possible removal from the food supply, because of its potential for increasing hypertension.

The review, conducted by the Federation of American Societies for Experimental Biology, suggests that additional study be made of more than a dozen additives, including caffeine, on which there was considerable disagreement. Additional information on BHA and BHT, two widely used preservatives, was also sought, as were data on the long-term effects of vitamin additives such as iron, zinc, vitamin A and vitamin D—each consumed in ever-larger quantities.

Sanford Miller, director of FDA's Bureau of Foods, says the agency will at first act only indirectly against salt. "We'd like to see more labeling, and then some voluntary reductions by the food companies. It would be extraordinarily difficult to ban salt or to establish appropriate levels for each individual product, but we will if there is no voluntary effort."

Revlon Funds Animal Test Research

Revlon, Inc., announced it will spend $750,000 on a search for alternatives to the Draize animal test, long the standard test for consumer products that may irritate the eye. The company made its decision in the midst of a consumer boycott and protest that brought 3000 letters into its New York headquarters.

The test, which consists of pouring chemicals into the eyes of rabbits, has been attacked by animal lovers. Revlon's announcement followed by a month the observance in Europe of "Remember the Revlon Rabbit Day" and by 2 months the placing of an ad in *The New York Times* that asked, "Is another Revlon shampoo worth blinding rabbits to you?" The ad's sponsor, an animal rights group, claimed that "we have documents showing that last year Revlon victimized 2210 rabbits without any pain relief." Revlon, which is only one of many cosmetics firms that rely on the Draize test to fulfill federal safety regulation, was placed in the uncomfortable position of denying at their recent press conference that it willfully tortured captive animals.

The $750,000 Revlon grant is to be spent over a 3-year period at Rockefeller University, probably on research with tests using tissue cultures and sensitive biophysical monitoring. Revlon is not above using pressure tactics of its own. Its chairman told the press he knows that the chief executives of other companies "share our concern for consumer safety and we trust they will participate with us" in financing the research. A bill has been introduced in Congress to order the financial participation of the regulatory agencies in a search for a Draize alternative.

The next target of the Coalition To Stop Draize Rabbit Blinding Tests is the LD-50 toxicity test. In the meantime, the coalition's organizers are trying to reduce the amount of Draize testing by urging consumers to "stick to tried and true brands; don't try anything new and improved that would require evidence of safety." An official of the Washington-based Institute for Animal Problems says with feeling that "we must stop reinforcing the hysteria of innovation that is a disease of this culture."

Too Much Congressional Direction?

The waning hours of the 96th Congress provided an opportunity for some extraordinary Capitol Hill muscle-flexing in the science area. Three science agencies were subjected to undue meddling, or aggressive congressional oversight, depending on the point of view. In one instance—the authorization for the National Science Foundation (NSF)—President Carter decried Congress' detailed instructions to the agency as "a dangerous turn. . . . These provi-

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sions are an incursion on Executive management responsibility, distort program balance, impede program management, and would be a serious problem for any agency."

NSF officials consider several of the provisions ludicrous. As part of a new program to increase the involvement of women in science, for example, the agency is required to sample the participation of men and women in "science and technology" jobs by discipline, race, and ethnic origin. The report, which Congress demands no later than January 1982, must include a tabulation of the "number of individuals in permanent and temporary, full-time and part-time scientific positions by appropriate level or similar category," also listing average salaries and "the number and type of promotional opportunities."

"Tell me what this means," says Thomas Ubois, the NSF assistant director for administration. Such a survey will cost millions of dollars, though alas no extra money has been provided to the agency. He says it is unclear whether the congressional committees are interested in private sector jobs as well as those funded by federal grants.

Both NSF and the White House budget office thought unusual the degree of specificity in Congress' demands. Grants under the new women's program, for example, can by law be made for only 3 years at a time, with only one renewal, while the minimum annual amount must be $10,000. "Suppose a lady requires only $5,000?" Ubois reasonably asks.

NSF was not the only agency to be hit by congressional *machismo*. The National Aeronautics and Space Administration (NASA) was told by the appropriations committees that it may not shift any of its funds from one program to another without the prior approval of the National Academy of Sciences and the National Academy of Engineering. Such shifts are required routinely as a result of massive cost overruns of the shuttle and technical difficulties with smaller programs.

The House subcommittee, headed by Representative Edward Boland (D-Mass.), has been rattled by NASA's recent financial decision-making on such projects as the Galileo probe of Jupiter and the space telescope. Boland sought at first to require that the committees approve any juggling of funds, but acceded to Senate objections by agreeing on academy review instead. The National Academy of Sciences (NAS), for its part, wants little to do with such a scheme.

Paul Sitton, the NAS executive officer, has termed the veto power "inappropriate, awkward, and confusing." He says the NAS has "no resources or staff to build up to that kind of operation." The committees had in mind a time limit of 60 to 90 days on the NAS review. "You know how often the academy gets a report out in 60 to 90 days," Sitton says frankly. NASA officials are alarmed at the prospect of long delays on financial problems that demand quick resolution. Nevertheless, both parties say they will attempt to implement the requirement in good faith. The NAS got $1 million for the task.

Finally, the agriculture committees of the House and Senate have directed the Environmental Protection Agency to get outside review of all scientific studies used as a basis for regulations. Also, all new pesticide rules may be vetoed by House-Senate concurrence. Together, the effect of these orders is not unlike that of the order binding NASA.

Many observers expect more of this from an assertive Republican Senate and the more politically balanced House.

Pope John Paul Meets the Scientists

A dozen Nobel laureates recently carried a message to Pope John Paul II in the Vatican that gently rebuts his criticisms of birth control techniques and recombinant DNA research. "Up to this time, the world has not fallen victim to the dire predictions of Malthus," the group told him in an hour-long audience. Science and technology can be applied to prevent such a disaster, by "providing guidance to the limitation of population growth," the group said.

The group, which included U.S. Nobelists Rosalyn Yalow, Lawrence Klein, Severo Ochoa, and Charles Townes, stated that biological and medical scientists were partly responsible for the population explosion, as a consequence of improvements in nutrition and prevention of disease. As such, they feel a "special responsibility in advocating methods of ending this crisis. . . . The dignity of human life is maintained only if we can ensure a balance between material supplies and the needs of the exploding population." They issued a "strong appeal to spiritual leaders to keep this balance."

On the subject of genetic engineering, they told the Pope that the ability

Rosalyn Yalow

to alter genes is a powerful research tool and "of great potential value to mankind," pointing specifically to the production of interferon and human insulin. Genetic engineering is conceptually akin to age-old plant and animal breeding, they said. The modification of human genetics "is more complex scientifically and raises ethical questions. It is critical to keep its ethical consideration separate from other forms of genetic experiments."

The group gathered in Rome under the auspices of Nova Spes (new hope), an organization that promotes the use of human values in development. The laureates also included Friedrich von Hayek, Jean Dausset, Hans Krebs, and Maurice Wilkins. Yalow describes it as a "good opportunity for scientists to make their views known to the Catholic hierarchy."

Pope John Paul read his own statement at the meeting, saying that distorted applications of science pose threats to man "that are unfortunately growing daily more grave," prompting some to speak of "a legitimacy crisis for science."

R. Jeffrey Smith