has also stood up to Administration opposition. When Health, Education, and Welfare secretary Patricia Harris recently announced the department's opposition to the bill, Brown in response asked NIH to sponsor a national conference on alternatives to live animal research and to determine the "state of the art." NIH has agreed, and has tentatively scheduled such a symposium for this fall. "For the NIH to pretend that it is somehow isolated from what can become very emotional issues is unrealistic," says William Raub, associate director at NIH for extramural research and training. "We thought a review of the various strengths and limitations of animal research would be helpful to the scientific community at large and to the congressional committees in particular."

In the meantime, the animal-rights consciousness of Congress continues to rise, most notably through the efforts of the New York-based United Action for Animals—the group that wrote the bill that Richmond introduced. Having already captured the cooperation and thus the letter-writing abilities of the majority of U.S. animal-rights groups, United is now lobbying in the halls of Congress, arguing issues, trying to convert congressmen and staffers to their cause. "Nobody has said from a scientific standpoint that we are crazy," says Elinor Peretsman, a New York-based lobbyist for United who says she comes to Washington every couple of weeks. "It's bureaucratic slowness and force of habit that is holding up the use of non-animal methods."

An example that Peretsman and other animal-rights activists use quite frequently is the well-known Ames test, a bacterial assay used to test chemicals for their ability to produce mutations, and thus possibly cancer. It is mere habit, says Peretsman, that keeps more researchers from turning to bacterial and cell systems rather than rabbits and guinea pigs. When making this point to a congressional aide, Peretsman pulls out numerous reprints of articles, such as "Bacterial tests for potential carcinogens" in the August 1979 *Scientific American*.

To counter the animal-rights people, scientific societies of late have started a lobbying campaign of their own, albeit on a smaller scale. "This bill would have a catastrophic impact on biomedical research," wrote Thurman S. Grafton, executive director of the National Society for Medical Research, to the subcommittee. He said the expense, slow results, and poor reliability of animal tests is making alternatives more and more attractive, but that forced adoption would be disastrous, because even alternative methods such as the Ames test have to be verified on live animals. "Each alternative method is limited to the artificial conditions created within that method," he wrote the subcommittee. "The ultimate answer to many biological problems can only be determined in intact live animals or humans because of the complexity of interacting phenomena involving enzymes, hormones, natural defense mechanisms, and other biochemical and neurologic reactions."

Other complaints center on the millions of dollars that the legislation would reappropriate. "These funds," wrote Association of American Medical Colleges (AAMC) president John A. D. Cooper to the subcommittee, "are excessive in view of the probable number of worthwhile projects on which to spend them." Grafton takes this point a step further. "Almost without exception, the in vitro methods currently available to us were fortuitous spinoffs accomplished by scientists working on a specific research project who in the process developed techniques that were either faster, cheaper, or more reliable. The idea of someone starting out solely for the purpose of developing a new technique appears to be a very unlikely approach to the goal." Grafton, along with the AAMC and other critics, also says the elimination of duplicate testing on animals would be unscientific, as findings always need to be verified.

Along with "ethical difficulties that would result from the elimination of animal testing prior to testing in human subjects," HEW secretary Harris opposed the bill from an administrative point of view. "It is difficult to conceive that such a Center, located within this department, would effectively set policy for the Department of Defense, the Department of Agriculture, the Veterans Administration, and other agencies involved in biomedical research."

Given the increasing opposition, and the fact that it is rather late in the 96th Congress for a bill to have not yet had hearings, supporters of HR 4805 are having doubts about the bill's chances for passage. Some say it probably will not get through this session of Congress, but they are ready to continue the fight. "Something will be done," says Peretsman. "We've got 13 or 14 scientists at this point who are willing to testify. We may not get a hearing in this session of Congress, and the ultimate legislation that's passed may not be in the form of 4805, but we've taken the first step."—WILLIAM J. BROAD

Big Future for Synthetics

Some observers have predicted that high energy costs will spur a major reversion from synthetic petroleum-based materials back to natural ones. But the latest report from Worldwatch Institute says synthetic materials are here to stay and "their production may in fact be one of the last major uses for oil and natural gas."

The report, by Christopher Flavin, notes that synthetic materials—namely plastics, fibers, and rubber—have an unsavory side to their reputation, associated as they are with the artificial, throwaway side of modern culture. But the truth is that their net energy use is actually less than that of comparable products made from natural materials. To give one example: in 1978 a National Science Foundation study revealed that, although it takes 25 percent more energy to produce a cotton-polyester blend shirt than an all-cotton shirt, the life-cycle energy requirement of the cotton shirt is as much as 90 percent higher because it is less durable and requires more maintenance.

The report, on "The future of synthetic materials: The petroleum connection," notes that world use of synthetics is currently 100 times what it was in 1950. Ninety-eight percent of synthetics are made from oil and natural gas (the rest are from coal). Seven percent of the world's oil and natural gas production goes into synthetics manufacture: 3 percent into plastics, fibers, and rubber and 4 percent for fertilizers, pharmaceuticals, and industrial chemicals. Production of synthetics is rising at 10 percent a year, although the growth rate is expected to slow in the next decade because of rising oil and gas prices.

Clearly, more efficient use of synthetics is called for. A huge reduction in disposable plastics is possible. Right now, 25 percent of all plastics manufactured—or 4 million tons a year—goes for disposable packaging, and "the U.S. tendency to overpackage" is spreading to Third World countries as well as Europe and Japan. Vast improvements can also be made in recycling. Since most of the energy in synthetics manufacture goes into creating the polymer rather than the final product, up to 90 percent of the energy could be saved by re-

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cycling some plastics. Separation of plastics for recycling could be made easier by reducing the number of plastics used in many products. Several kinds are used for such simple items as margarine tubs.

The underlying message of Flavin's report is that to make best use of our remaining oil and gas supplies, developed nations had better start getting their priorities in order. It is probable that "oil use [because of cutbacks in long-range production plans] will never rise much above the current level and could be well below it by 2000." Although "it is probably safe to predict that a barrel of oil will cost $100 before the end of the decade," writes Flavin, "most societies use oil and gas quite indiscriminately . . . it is as if the world community were a family that kept the house warm by burning finished lumber in the fireplace."

Government incentives to encourage efficient use of oil and gas supplies are desirable, but "it would be hard to justify giving synthetic producers advantages over other oil users if large quantities of petrochemicals continue to be converted into plastic trash."

Feds Defend Bubble Meddle

Scientists have been disgruntled over awkward attempts by the departments of Commerce and State to prevent communists from gaining access to information at two conferences held recently in California (*Science*, 7 March). At one conference, on bubble memory technology, the government denied visas to several Russian and Eastern European scientists and induced Chinese scientists to sign "letters of assurance" that they wouldn't impart any information gained to citizens of 17 other communist nations. Visas were also denied Soviets who planned to attend a later meeting about laser fusion. The fuss stimulated an indignant flurry of letters from scientists to officials at State and Commerce.

On 25 April the AAAS committee on Scientific Freedom and Responsibility, headed by Harvard biologist John T. Edsall, invited State and Commerce officials to come over and explain their behavior (described by John L. Vossen, head of the American Vacuum Society which sponsored the bubble memory meeting, as an "unprecedented, frivolous and foolish exercise of hamhanded bureaucratic power over a technical meeting").

A State Department representative explained that the visa denials were directly related to the government's effort to tighten up on scientific contacts following the Soviet invasion of Afghanistan and the exile of Andrei Sakharov. He said the department had no problem with "bona fide" Russian scientists (that is, nonspies) coming to open scientific meetings, but it wanted to stop Russians coming in by the "back door" to high-technology conferences where they had easy access to the sort of information the Administration is trying to keep from them in government-to-government contacts.

This seemed pretty straightforward and members of the committee appeared to accept the policy so long as technical societies were not, as they were in the California meetings, put in the embarrassing position of having to do the disinviting after the State Department had, apparently mistakenly, already issued visas.

The committee had more difficulty swallowing the Commerce Department explanation of its application of the Export Control Act at the bubble memory meeting. This act gives the department authority to control the export of material and information (including that conveyed orally to a foreigner) if it is deemed threatening to national security. The act, which has been in force for 30 years, is commonly applied to corporate activity and in fact, as far as Kent Knowles from Commerce knew, this was the first time it had ever been invoked to apply to information conveyed at a scientific meeting. He said that the regulations applied because it was a case of "data not publicly available" relating to bubble technology applications being conveyed to foreigners. The scientists on the committee thought it was silly for anyone to regard the information being bandied about at the bubble meeting as being in any way sensitive or proprietary since, as they pointed out, there were representatives from about 24 competing firms there, none of whom would have divulged anything the rest didn't already know. After several rounds of good-natured and repetitious arguing, the disagreement between Knowles and the committee remained intact.

Both visiting officials indicated that the probable upshot of the fuss will be attempts by the departments involved to clarify their positions and improve communications with the scientific community. Warned Edsall: "you may be doing more damage to the progress of technology in the U.S. by making things difficult for us than you are gaining by obstructing foreigners' access to meetings."

Time for *Discover*

After years of talking it over, Time Inc. decided on 17 April to go ahead with a new popular magazine about science. Called *Discover*, the first issue of the monthly will appear in late September. *Discover* will be competing directly with *Science 80*, the AAAS's entry into the fast-growing field of science publications, which made its debut last November.

According to its editor, Leon Jaroff, *Discover* will have a "slightly different tone" from *Science 80* and will be "more like a *Time* magazine of the sciences"—that is, more newsy and with shorter articles. It will have a number of *Time*-like features, including one on "science people" and reviews of books, movies, and television shows that have a "science or pseudoscience theme." It will be on the lookout to nail "distorted impressions of science," says Jaroff. "If a David Rorvik book [an allegedly factual book about human cloning] comes along we'll tear it apart mercilessly."

Discover aims to reach an initial circulation of 400,000 (*Science 80*'s current circulation) and although Jaroff will not speculate on the ultimate market, "a meaningful figure to Time Inc. would be greater than 1 million." Start-up costs, according to a Time executive, are to be "in the double-digit millions." (*Science 80* started with $1.2 million.)

Jaroff says that to start the magazine now, with the economy in the shape it is in, "took a lot of guts." But he is convinced that the audience is there. He notes that issues of *Time* whose covers dealt with science have consistently had the highest sales, topped only by those featuring drugs, sex, and rock stars.

Constance Holden