pledged to devote more resources to efforts by their scientists to improve dialogue with the public and news media and also to take such efforts into account when they evaluate those researchers. In addition, the memo says "an incentive system is to be developed that will be suitable to offer the prospect of rewards to those scientists who are actively engaged in fostering dialogue with the public." The Science Promotion association has already posted a grant application form on its Web site (www.stifterverband.de) for grants ranging from $11,500 to $35,000 for scientists' programs that would help explain research to students, teachers, churches, local groups, and the news media. The grant recipients will be chosen by a jury, led by Joachim Treusch, chair of the Jülich national research center, and including prominent German science journalists.

The German initiative parallels similar efforts in the United Kingdom and the United States, which Germans believe have helped connect science and society. In addition to the PUSH grants, Treusch is leading an effort to organize a major science festival in Berlin in 2001 which he says might take some pointers from the annual meetings of the American Association for the Advancement of Science (the publisher of *Science*) and its British counterpart on focusing attention on science. Says Treusch: "We have the obligation to give German science a major step forward into the new century with this PUSH."

–ROBERT KOENIG

DEFENSE SCIENCE

Outlook Improves for Research Funding

Funding for defense-related research has languished since the Cold War, even as some civilian research budgets have spurted ahead. Now Congress is moving to slow the trend, proposing to erase cuts in military science that were requested by the Clinton Administration. But some administrators and lobbyists worry that the gains may not hold in an especially uncertain budget year.

In February, the White House submitted a 2000 budget request that shrank the Department of Defense's (DOD's) $4.3 billion basic and applied research accounts by 5%. Although the Clinton budget would raise overall defense spending by a hefty $12.6 billion, it held the Pentagon's basic research account steady at $1.1 billion and trimmed the applied account by more than $230 million, to $2.9 billion. If approved by Congress, the cuts would have pushed DOD research spending to its lowest level in 35 years when adjusted for inflation.

CREDIT: (TOP) HOUSE COMMITTEE ON VETERANS AFFAIRS

That prospect greatly worries university administrators. DOD is the third-largest source of academic research funds (after the National Institutes of Health and the National Science Foundation), with more than 350 U.S. schools getting defense dollars. Some disciplines are especially dependent on military support: The Pentagon provides 70% of federal funding for electrical engineering, 60% for computer sciences, and about one-third for math and oceanography, for example.

In an April response to the threat, 19 university groups, scientific societies, and business groups formed a Coalition for National Security Research. The lobbying effort—coordinated by Liz Baldwin of the Optical Society of America and Peter Leone of the American Association of Engineering Societies, both in Washington, D.C.—bore fruit late last month, as the full Senate and the House Armed Services Committee separately recommended defense spending levels that are friendlier to research. Lawmakers suggested spending $7 million to $15 million more on basic research than the White House request, and they nearly reversed the cut in applied science with a proposed budget of $3.1 billion. A Senate appropriations subcommittee—which actually approves spending—did even better, voting an even smaller cut in applied research and a $35 million boost for basic science.

Congressional staffers say that lawmakers eager to fund specific initiatives, such as one to develop an antimissile laser and another to combat bioterrorism, fueled the increases. But the concerns raised by university presidents and the coalition also played a role. "We felt their pain," says one House staffer. Indeed, both Armed Services committees scolded DOD for its paltry request, with the House panel saying "it does not believe DOD has a coherent R&D funding strategy."

Although the numbers are preliminary, some coalition members say they are a good omen. "It was heartening to see that the members were concerned enough to up the numbers," says Leone. But he and others admit they are far from the coalition's goal of a 2% overall R&D boost this year. That reality "is disappointing," says Greg Schutz of the American Chemical Society in Washington, D.C., who worries that any cut in applied science budgets could threaten some physical chemistry labs.

Schutz and others also fret that success could be ephemeral, pointing to the rising costs of the Kosovo conflict and mounting pressure to beef up other portions of the defense budget. "The tide has been going in and out on the budget process all year," he says.

–DAVID MALAKOFF

CLINICAL RESEARCH

NIH Ethics Office Tapped for a Promotion

A government watchdog that monitors the treatment of patients and animals in federally funded research may be about to develop a more powerful bite. A panel recommended last week that the unit, called the Office for Protection from Research Risks (OPRR), be moved up the federal hierarchy. It currently resides in the office of National Institutes of Health (NIH) director Harold Varmus, and the panel urged that it be shifted to the Department of Health and Human Services (HHS). Varmus agreed that this would be appropriate to avoid an apparent conflict between NIH's dual roles as funder and regulator of clinical studies.

On the move? OPRR chief Ellis (right) and staffer Tom Puglisi speak at a House hearing.

The proposal to give OPRR higher status was discussed on 3 June at a meeting of Varmus's scientific advisory committee and was approved so quickly that some observers felt this was exactly what Varmus wanted. "It looked like a done deal," says one non-NIH expert on bioethics who has followed the process closely. He thinks NIH may have decided to make a change after media and congressional attention focused on recent lapses in the treatment of human subjects. Last year, for example, witnesses at a congressional hearing blasted OPRR—which is supposed to keep tabs on research funded by 17 federal agencies—and others for lax enforcement of rules designed to protect volunteer research subjects (*Science*, 19 June

1998, p. 1830).

Not long after that hearing, Varmus tapped an independent panel to consider the future of OPRR. Leading the six-person team were co-chairs Nancy Neveloff Dubler, director of the bioethics division of the Montefiore Medical Center in the Bronx, New York, and Renee Landers, an attorney at Ropes & Gray in Boston. After interviewing 15 officials and reviewing files, they reached their conclusions in May.

The panel noted that the size of the clinical research enterprise is growing, as is public concern about the welfare of human subjects. But it warned that OPRR, as the public's guardian, has a problem: Because it is located in a research agency, there is a "perception that OPRR's actions will be biased in favor of research interests and will provide insufficient protection to research subjects." And this, the panel found, contributes "to the public distrust of the research enterprise."

The panel found that such concerns are "not just abstract or hypothetical." OPRR's recommendations sometimes seem "compromised" by its location deep in the bureaucracy, Landers said in a telephone interview. "It isn't able to speak with a clear voice" on policy initiatives, according to Landers, because NIH's process of collegial review tends to filter out disagreements. This process can muffle signals, preventing HHS higher-ups from hearing an important message, Landers said. At the same time, the panel suggested that NIH might have trouble supervising OPRR, because any attempt to exercise control might be interpreted as improper meddling.

The report recommends that OPRR be moved to HHS, preferably in the office of the surgeon general or assistant secretary for health. In addition, the report says the OPRR chief should be elevated to the Senior Executive Service, opening the way to recruiting a widely respected national leader. (If the civil service rank were changed, the current director, Gary Ellis, would have to reapply for his job.) And the panel urged that OPRR be given an advisory panel, a larger budget, and a more active role. It currently has a staff of just 28 people. But Landers is careful to add, "It was not our intent" to encourage a "more aggressive, prosecutorial approach."

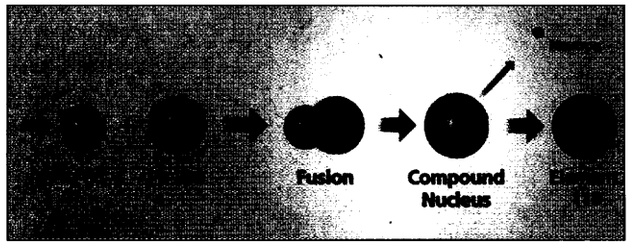
The initial response was muted. One member of Varmus's advisory panel—William Brody, president of The Johns Hopkins University in Baltimore—worried about the "profound implications" of turning OPRR into a "free-ranging organization." But biomedical and clinical research groups have not objected. Ellis commented that "OPRR feels thoroughly examined," but did not disagree with the report. Mark Yessian, a staffer in the office of the HHS inspector general who studied this issue last year, said the report "makes a good case" for relocating OPRR but added, "I just hope it isn't seen as 80% of the answer" to improving oversight. Yessian wrote a report last year that found that the network of local institutional review boards (IRBs) that monitor human subject research at universities and other institutions is "in jeopardy." He thinks the IRB system needs to be revamped as well.

Varmus, who foresaw "political trouble" for NIH if it retained authority in this area of bioethics, seemed happy to let it go. He said that he would send the new report to HHS Secretary Donna Shalala right away and urge her to implement it. **–ELIOT MARSHALL**

NUCLEAR PHYSICS

Berkeley Crew Bags Element 118

Step aside, element 114; there's a new heavyweight champ. Physicists at the Lawrence Berkeley National Laboratory in California announced earlier this week that they have created two new superheavy elements, tipping the scales at 118 and 116 protons. The new heavyweights come as something of a surprise, as standard theories had suggested that the technique used to create them—fusing two medium-weight nuclei at a relatively low energy—should top out at 112. The team's success suggests that the method may produce weightier champs, with atomic numbers 119 and beyond. "It's a very exciting result," says Ron Lougheed, a heavy-element physicist at Lawrence Livermore National Laboratory in California. "I suspect it will lead to a flurry of new isotopes in this region."



Rare species. It took roughly 10^{12} krypton-lead collisions to produce each atom of element 118.

CREDIT: LBNL

Ever since the early 1940s, when Glenn Seaborg and his Berkeley colleagues created the first handful of artificial elements beyond the 94 that exist in nature, physicists have vied to forge the next heaviest element. The most recent milestone came in January when researchers at the Joint Institute for Nuclear Research in Dubna, Russia, won a race to create the long-sought element 114 (*Science*, 22 January, p. 474). Element 114 was a special prize because its 30-second lifetime seemed to confirm predictions of an island of stability—a realm of superheavy elements including 114 and its neighbors, whose nuclei have an internal structure that makes them more stable than heavier and lighter isotopes.

Although the 114 work has yet to be duplicated, the success marked an unexpected renaissance for a previously successful technique known as hot fusion, in which a beam of light isotopes is smashed into a heavier target, such as plutonium. Prior to that success, the technique of choice had been cold fusion, a gentler collision of medium-sized isotopes. Researchers at the Institute for Heavy Ion Research (GSI) in Darmstadt, Germany, used the technique to lay claim to five elements from 107 to 112 since the early 1980s. Conventional theories suggested that neither technique would be able to form elements as big as 118 without them instantly breaking apart, or fissioning.

The Berkeley team's big break came at the prodding of Robert Smolańczuk, a visiting theorist from the Soltan Institute for Nuclear Studies in Poland, who suggested that there may still be a little warmth left in cold fusion. His calculations suggested that bombarding a lead target with krypton ions would have reasonable odds of producing a few atoms of 118 after all: The compound nucleus, he found, was less likely to fission than previously thought. "We didn't really believe it," says Ken Gregorich, who led the 15-member Berkeley team. "But it was one of those experiments where there was little to lose and a big upside. We tried it and were surprised to see something."

They saw a lot of somethings. After an accelerator flung the krypton ions into the lead, the impact debris was swept into another machine that separated detritus from atoms of potential interest, which were channeled to a radiation detector. The detector measured a distinct pattern of alpha-particle emissions as the sought-after heavyweight shed pieces of itself in search of a more stable configuration. "During 11 days of experiments, three such alpha-decay chains were observed indicating production of three atoms of element 118," says Gregorich. As an added bonus, the first alpha decay in each case produced an atom of element 116—also never before seen. And the time course of the decays lent support to the theory of the island of stability around element 114.

Next up, Gregorich says, his team plans to switch the lead target for one of bismuth atoms, which harbor an extra proton. If they fuse with krypton, the group will have yet another champ at 119. **–ROBERT F. SERVICE**