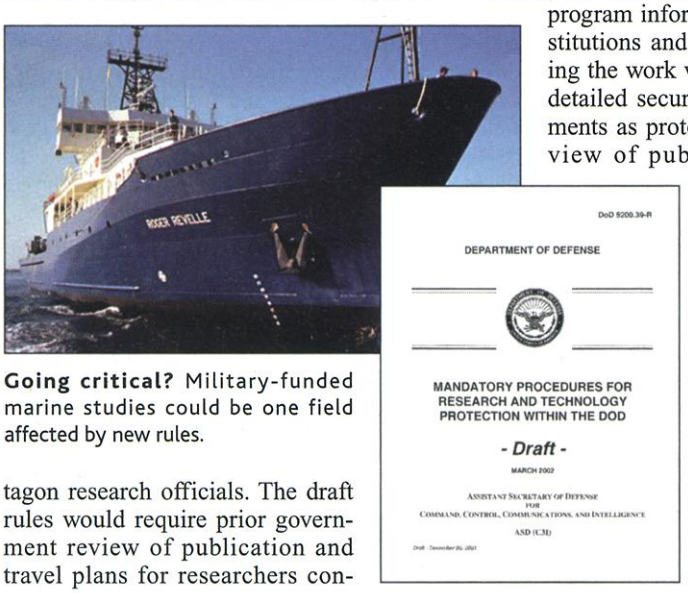
ever, to extend a linkage to the overlying stratosphere just yet. "You certainly can't rule out a role for ozone" in climate change, says meteorologist James Hurrell of the National Center for Atmospheric Research in Boulder. "But I think other things may be contributing." He and Hoerling have shown that, in climate models, the recent warming of the tropical ocean drives the AO into its positive phase (*Science*, 27 April 2001, p. 660). Now the big riddle about the patchwork of Antarctic climate change seems to have shifted from "What is the culprit?" to "What could be pushing the AAO to such an extreme?"

–RICHARD A. KERR

NATIONAL SECURITY

Pentagon Proposal Worries Researchers

A proposal to impose new controls on U.S. scientists who do basic research for the military is drawing fire from universities, members of Congress, and even some top Pentagon research officials. The draft rules would require prior government review of publication and travel plans for researchers conducting nonclassified research deemed "critical" to national security. Critics say the new rules are largely redundant, and they warn that the added paperwork could scare away top scientists from working with the Department of Defense (DOD).



Going critical? Military-funded marine studies could be one field affected by new rules.

The draft rules "are a valid effort to reassess security, but they don't appear to be very well thought out," says Jacques Gansler, a former top Pentagon research administrator in the Clinton Administration and now head of the Center for Public Policy and Private Enterprise at the University of Maryland, College Park. In an internal analysis obtained by *Science*, Don DeYoung, executive assistant to the director of research at the U.S. Naval Research Laboratory in Washington, D.C., argues that the rules "can be expected to have a chilling effect" on defense research.

The Pentagon will spend about $1.4 billion on basic research this year, with more than half going to universities for fundamental work in areas such as computer science, mathematics, and engineering. Although academic researchers have traditionally faced few restrictions, universities have reported sporadic Pentagon efforts to restrict the flow of unclassified information since the 11 September terrorist attacks (*Science*, 22 February, p. 1438).

Last week, those whispers took shape in the form of a leaked 120-page draft regulation entitled *Mandatory Procedures for Research and Technology Protection Within the DOD*. The internal document, dated 25 March and first reported last week by the *Chronicle of Higher Education*, describes a multilayered plan for protecting sensitive information. The first step would have Pentagon program managers decide if DOD-funded studies at universities, companies, or military laboratories involve "critical research technologies" or "critical program information." If so, the institutions and researchers conducting the work would have to prepare detailed security plans, label documents as protected, obtain prior review of publication and travel plans, and decide whether to place restrictions on any foreign scientists involved in the project. The Pentagon would also create a centralized database to track the work it has funded.

The plan is deeply flawed, says DeYoung, who responded to a memo from senior DOD officials asking for comment. In a brisk seven-page analysis, he argues that the draft rules overstate potential threats, ignore a 16-year-old presidential order against restrictions on military-funded basic research, and duplicate existing government efforts to protect critical technologies. He also argues that the rules will lead to a counterproductive, ever-expanding definition of critical research. "In a competitive budget environment," he writes, "there will be a strong propensity for managers to designate their projects as critical."

Such fears are being echoed in Congress. "This could become another endless bureaucracy," says one Senate aide. Adds Senator Jeff Bingaman (D–NM), who sits on the Armed Services Committee, "they are trying to wall off researchers." Despite such concerns, however, lawmakers plan to wait for the Pentagon to come up with a final plan before reacting. "There isn't much appetite right now to micromanage [the military]," says a House aide. University and industry lobbyists are also keeping their powder dry in hopes that the Pentagon will modify its current proposal. DOD has been asked to extend the comment period, which was supposed to end this week.

Gansler laments the fact that the proposal comes "just as world-class researchers and companies were showing a little greater interest in doing defense research." He fears that any additional rules may cement the Pentagon's reputation as a funding source that's more trouble than it's worth.

–DAVID MALAKOFF

RESEARCH FUNDING

Europe Begins Work on Modest New Agency

STOCKHOLM—You know scientists are desperate when they clamor for new bureaucratic paws on the R&D purse strings. But rampant dissatisfaction with Europe's basic research strategy—or lack thereof—has sparked calls for a new grantmaking body to fill the void. At a meeting here last week, the continent's top science managers started to flesh out a proposal for a European Research Council (ERC). It may not be what many scientists were hoping to see, but it does reflect budgetary constraints and the reality of the European Union's byzantine politics.

The council's proponents invoke some disturbing numbers in arguing their case. European governments spend, on average, 2% of their budgets on R&D, compared with 4.2% in the United States, and the gap has widened significantly since 1995. "We have to do something, and we have to do it now," says Dan Brändström, executive director of the Bank of Sweden Tercentenary Foundation and chair of a Swedish committee on the future of research in the European Union.

Most research funding in Europe—roughly 96%—comes from national agencies. Nearly all the rest comes from a $4-billion-a-year pot known as the Framework program, administered by the E.U. But Framework targets mainly R&D that is likely to benefit industry in the near term, and industry currently favors hot fields such as genomics and nanotechnology.

That has left many disciplines out in the cold, including some that are starved for support from the national agencies. Frank Gannon, executive director of the European

CREDITS: (TOP TO BOTTOM) SCRIPPS INSTITUTION OF OCEANOGRAPHY; DOD

Molecular Biology Organization, sees an "enormous increase" in the number of microbiologists leaving Europe for the United States. Other fields are faring even worse, he says: "There's a great danger that all research on plant biology will be snuffed out."

Such looming threats prompted a meeting last week at the Royal Swedish Academy of Sciences, where some 60-odd participants bandied about a new watchword: reapportionment. The idea is to lobby E.U. ministers to endow ERC by taking a tithe from Framework and other programs; national research agencies may also be pressed to contribute. Even that amount may not be enough, say some observers: Claiming a tenth of the E.U.'s much larger agricultural subsidies, for example, would allow the E.U. to double its science budget, notes Michael Sohlman, executive director of the Nobel Foundation. "One has to present politicians with a choice," he says. "Is agriculture the great future of Europe or is R&D?"

The participants would prefer to see the council created outside of Framework, which is tainted by what one observer calls "a credibility problem." "Scientists don't trust it," he maintains. Some mandarins suggest that the new council's initial remit should be to fund projects that are too risky for most national agencies; a promising model might be the U.S. Defense Advanced Research Projects Agency's nonclassified portfolio. Such an approach might also help Europe retain young, innovative researchers who now tend to go elsewhere. "The problem is not money. It's people," asserts Reinder van Duinen, ex-president of the Netherlands Organization for Scientific Research.

"Is agriculture the great future of Europe or is R&D?"

—Michael Sohlman, the Nobel Foundation

CREDIT: THE NOBEL FOUNDATION

The discussion here was intended to set the stage for a meeting in October in Copenhagen, where the parties hope to hammer out an ERC vision and timetable. Further delays will only widen the competitiveness gap between Europe and the United States, predicts Fotis Kafatos, director-general of the European Molecular Biology Laboratory. For Europe's scientific community, he says, "this is a moment of truth." **–RICHARD STONE**

PROTEOMICS

Public-Private Group Maps Out Initiatives

A new group hoping to spur a global effort to determine the structure and function of all proteins made by the human body kicked into gear last week. The Human Proteome Organization (HUPO), an international alliance of industry, academic, and government members, laid out its first set of initiatives and has begun knocking on industry doors for funding.

HUPO was formed about a year ago by a group of scientists who wanted to make sure that companies don't lock up basic proteomics data under trade secrecy (*Science*, 7 December, p. 2074). The founders also wanted to include more countries than participated in the Human Genome Project. After an initial meeting last fall, HUPO participants this week fleshed out five initial projects (see table). "We want to nail down specific initiatives" so companies will be interested in contributing funding, says HUPO president Sam Hanash, an oncologist at the University of Michigan, Ann Arbor.

The list is a mix of technology, tools, and research. For example, HUPO's bioinformatics plan would develop community-wide standards for presenting mass spectrometry and protein-protein interaction data. Another initiative would create a collection of antibodies for the primary proteins made by the 30,000 or more human genes. HUPO also wants to identify thousands of new proteins present in small amounts in blood, which would be very valuable to companies developing diagnostic tests. All the data would be freely available through public databases.

Pieces of these projects are already under way. Protein chemists in Germany this summer expect to submit a 40-million-euro grant request to the European Union for an antibody initiative, and companies have shown interest in matching the funds, says Wolfgang Mutter of the health-care company Roche. A plan by the Asian and Oceanian branch of HUPO to form a liver proteome consortium—part of HUPO's cell models initiative—could soon get a jump-start: Korea's multibillion-dollar, 10-year 21st Century Frontier Research Program is considering devoting some funds to it, says Young-Ki Paik of the Yonsei Proteome Research Center.

HUPO still needs to raise a lot more money, however. "These are not small projects," says Emanuel Petricoin III of the U.S. Food and Drug Administration. "The goal is to get buy-in" from companies and then matching government funds, he says. Some companies have already chipped in a few million dollars. They include Amersham Biosciences, which announced at the meeting that it would spend $500,000 on seminars. Amersham's Günter Thesseling says the fact that everybody will have access to the results of HUPO projects is a plus. The data are "a prerequisite that everybody should be able to use," he says. Chris Spivey, who's working on business support for HUPO, expects much bigger commitments by HUPO's next meeting in Paris in November. "The sums of money are going to be substantial," he predicts.

HUPO's Wish List

Plasma proteome Identify less abundant proteins in blood, initially in healthy adults.

Antibody initiative Build library of antibodies for 30,000 gene products.

Cell models Carry out liver proteome project; coordinate data standards for heart and other existing proteome studies.

Bioinformatics Develop databases, analysis software, and annotation standards.

New technology Develop methods for quantifying 5000 proteins and their interactions in a tissue or cell type.

While HUPO is forging ahead with its first projects, the U.S. National Institutes of Health (NIH) is still mapping out its own proteomics strategy. At a meeting* last week in Bethesda, Maryland, proteomics experts went back and forth over possible recommendations on the best way for NIH to encourage the field's development. Many, like Ruedi Aebersold of the Institute for Systems Biology in Seattle, voiced support for a handful of pilot-scale centers to identify proteins en masse from selected tissues or blood serum using mass spectrometers. But because current mass spectrometers have difficulty spotting small amounts of proteins in a sample and cannot detect many of the key regulatory modifications that occur to proteins after they are synthesized, other researchers were less enthusiastic about the value to basic researchers of such pilot studies. That left many looking to HUPO for the early action. **–JOCELYN KAISER**

With reporting by Robert Service.

* Human Proteome Initiative Workshop, 29 April 2002, National Institutes of Health, Bethesda, Maryland, hosted by the National Cancer Institute and Food and Drug Administration.