Can Carol Browner Reform EPA ?

One year after becoming EPA administrator, Browner has a lot to do to fulfill her promise to make science the centerpiece of environmental regulation

On 22 November last year, Carol Browner, administrator of the Environmental Protection Agency (EPA), gave her troops a pep talk. Standing with her top aides on a podium outside EPA headquarters, Browner complimented her staff, laid out her agenda, and exhorted everyone "to employ the best possible science" in making regulatory decisions for the $6.6 billion agency. The scientists applauded her words that balmy fall day, but for them, the lineup sent a less positive message. The agency's science adviser wasn't on the rostrum—he apparently didn't rank as a top aide—and conspicuously absent was a permanent head of the Office of Research and Development (ORD), the agency's main research arm. Almost a year after Browner took office, she has yet to find a prominent outside scientist who's willing to take the job.

Environmental scientists say the gaps in that lineup are a small but telling reminder of how hard it will be for Browner to achieve her goal of putting science at the heart of EPA decision making. It's not for lack of trying: In a recent interview with *Science*, Browner talked about her plans to improve communications between EPA scientists and regulators, to incorporate scientific issues into the regulatory process at the earliest possible stage, and to solicit opinions from outside scientists and other constituents in a series of public meetings. But she must also deal with a track record that causes scientists to gnash their teeth. "The agency still doesn't have an understanding of science," says Ellen Silbergeld, a University of Maryland toxicologist who closely follows federal environmental policy.

In particular, scientists want the former Florida state environmental official to do a better job incorporating scientific and economic uncertainties into its regulations, and to stop diverting funds from long-term research into short-term projects to support regulatory decisions. "EPA often makes assumptions that, in my view, are not biologically plausible," says toxicologist Bailus Walker, dean of the University of Oklahoma's Health Science Center, who was Browner's choice to head ORD until he withdrew last July (see box, p. 313). Within the agency, says EPA toxicologist Linda Birnbaum, "we'll initiate a major program, then all of a sudden there's no money." Scientists are also unhappy with the lack of progress on implementing some of the recommendations in two reports commissioned by Browner's predecessor, William Reilly, that urged EPA to improve its science and bring its activities more in line with actual environmental risks (see table, p. 314).

RICK KOZAK

Make way for science. Browner wants "fundamental overhaul" of how EPA uses research.

"It's bizarre," says Rutgers toxicologist Michael Gallo. "For years, we in the environmental science community were extremely worried about the Reagan-Bush approach to things. Now all we talk about is the level of stagnation—no, catatonia—we see in the [Clinton] Administration."

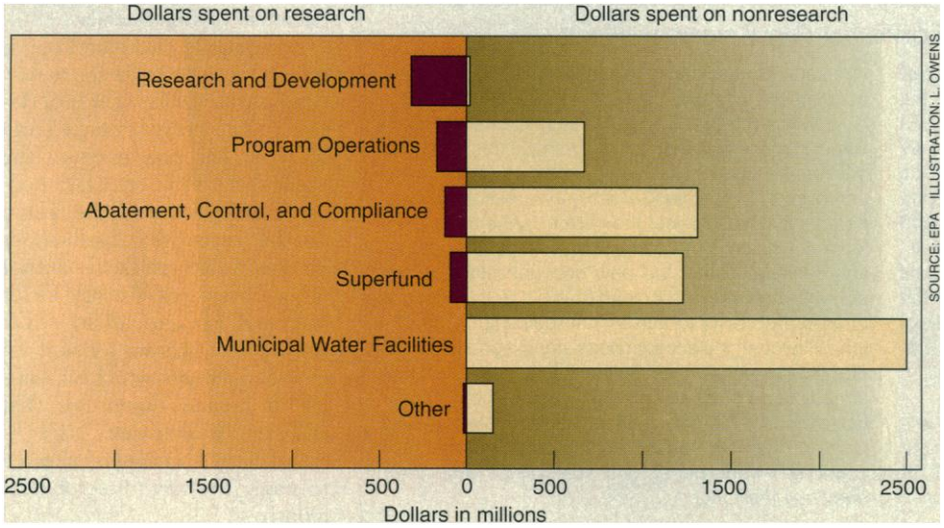
Browner acknowledges these problems and says she understands the frustration of EPA scientists whose basic research projects have been brought to an abrupt halt. "There's no point putting money in a long-term project if you can't put it in for 5 or 6 years," she says. But real change, she says, will require no less than a "fundamental overhaul of how EPA perceives the role science plays in agency decisions."

Research potpourri

Browner will have to change perceptions throughout the agency, for EPA's research enterprise is spread across several offices, each of which has its own mission and its own reasons for supporting research. Estimates of EPA's annual research budget range from $500 million to more than $1 billion, depending on how research is defined (see chart). The lion's share is spent by ORD, which operates a dozen in-house laboratories as well as an extramural program for contractors and academic scientists.

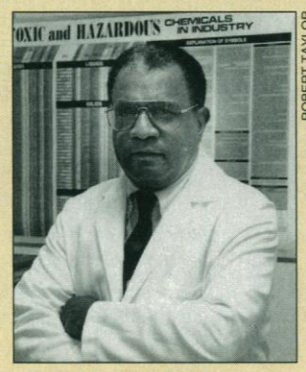
Its work is intended to help EPA carry out its primary role as a regulatory agency, charged with protecting the nation's environment—a role spelled out in such major pieces of legislation as those focusing on clean air, clean water, and the use of pesticides. But, as the agency prepares to mark its 25th anniversary next year, it is facing a growing backlash from environmental policy makers and scientists questioning whether the $115 billion spent each year in the United States on environmental protection reflects the best scientific understanding of environmental and health risks. Cash-strapped local governments, in particular, are challenging the scientific basis of "un-

Where EPA Spends Its Research Dollars (by account)



Strict Ethical Rules Confound EPA Science

Carol Browner says the hardest scientific problem she's faced in her first year as Environmental Protection Agency (EPA) administrator has been finding a prominent scientist to head the agency's Office of Research and Development (ORD). She thought she had filled the job last February when the White House annnounced its intention to nominate toxicologist Bailus Walker, dean of the University of Oklahoma's Health Science Center. But Walker withdrew from consideration 5 months later, before the White House sent his nomination to Capitol Hill for approval. Since then, several academic scientists have told EPA they are not interested in the job.



ROBERT TAYLOR

Bailed out. Bailus Walker said no to top research job.

The main problem is the EPA general counsel's strict interpretation of government ethics rules. "The ethics rules fail to take into account the life of an academic scientist," says Browner.

In Walker's case, the stumbling block was a new guideline from the White House that restricts the activities of political appointees after they leave federal service. The rule states that a "senior appointee" must not "lobby any officer or employee of that agency" for 5 years after leaving that agency. To EPA's general counsel, the rule amounts to a 5-year moratorium on seeking EPA grants.

"The 5-year moratorium was one of the most critical factors in my decision" to pull out of the nomination process, Walker says. "I had to think about employment options after federal service." Walker had complained in July about an "inordinately long" vetting process (*Science*, 6 August 1993, p. 671), but he says now that his reference to having "additional time to rethink the ramifications" of taking the job "was really a code word for weighing the pros and cons of the ethics rule."

A second deterrent to recruitment is a rule that precludes federal workers from using their official titles to endorse certain activities. The EPA general counsel's office says this means an ORD chief must immediately sever all ties with ongoing projects, even unpublished research. "There's no problem with polishing up a report," says Gerald Yamada, deputy general counsel, but nominees must refrain from doing "midstream" work. This rule has doomed consideration of several prominent academics, including Frederica Perera, a molecular epidemiologist at Columbia University. "We were writing up studies that have lasted 3 to 5 years," says Perera, who says she was sounded out for the ORD job. "That's a difficult time for any researcher to say, 'I'm going to disconnect from my work.'"

The agency's interpretation of ethics rules affects rank-and-file scientists, too. Last month, for example, ORD held a meeting to develop a research plan to study the health effects of gasoline additives used to reduce smog, inviting scientists from the Centers for Disease Control and Prevention, the state of Alaska (some of whose residents have complained of health problems stemming from use of the additives), and industry. But university scientists and contract researchers were excluded because, as explained in a document obtained by *Science*, "EPA's ethics and extramural funding regulations would prevent them from receiving EPA funds to perform the planned projects."

Other research agencies appear to be taking a less restrictive approach. "The problems EPA appears to be experiencing haven't occurred at NSF [National Science Foundation] to my knowledge," says NSF general counsel Lawrence Rudolph. Even officials at the Food and Drug Administration (FDA), a regulatory agency like EPA, say they haven't experienced similar problems in recruiting top scientists.

For now, EPA's general counsel's office has no plans to alter its interpretation of the ethics rules. "I've been asked to explain the rules, and some people haven't been happy," says Yamada. However, he adds, "No one has asked me to bend the rules." And despite the discomfort caused by the rules, Browner says she has no plans to force him to bend.

–R.S.

funded mandates"—federal environmental regulations that municipalities must pay for. At least one city—Columbus, Ohio—has even formed an environmental science advisory committee that, according to its chairman, chemist Edward Hayes of Ohio State University, "is a source of independent scientific and engineering advice about environmental risks and remedies." The panel hopes to educate EPA about the scientific uncertainties of environmental protection at the regional level.

The public also wants EPA to build its regulations on a more solid scientific foundation. In a survey of 1000 Americans released earlier this month by the Harvard Center for Risk Analysis, 83% agreed "the government should use risk analysis to identify the most serious environmental problems," but only 42% thought "the government does a good job of using science in the development of environmental regulations."

Congress, too, is beginning to pay more attention to EPA science. The House and Senate are considering legislation to add an extra layer of scientific review to EPA's decisions and to compare the costs and benefits of proposed and existing regulations. But that attention isn't entirely benevolent. One of President Clinton's campaign pledges—to raise EPA to Cabinet status—has been stymied by attempts to mandate risk and benefit-cost assessments that might force EPA to use particular scientific analyses even after they become obsolete.

Looking for answers

In response, Browner says her goal is to ensure that "good science is at the foundation of every decision EPA makes," and an Administration official says the president's 1995 budget to be submitted next month will include more money for ORD. But Browner confesses she doesn't have all the answers. "I'm looking to people inside the agency, people who've been here 10, 20 years," says Browner, "and I'm saying to them, 'What do you think is the best way to use our science?'"

One of the biggest complaints Browner is hearing from those veterans is that the agency has failed to design and carry out a sound long-term research agenda. Although they wouldn't mind getting more money, EPA scientists are more troubled by the agency's ever-changing research priorities. "We constantly have to justify and rejustify what we're doing," says Thomas Murphy, director of an EPA laboratory in Corvallis, Oregon. Notes David Rall, a former head of the National Institute of Environmental Health Sciences, "When there's a regulatory crisis at EPA, everything else stops."

A top-notch ORD chief could go a long way toward rectifying these problems, say environmental scientists. "If the agency is serious about improving its science," says University of Texas environmental engineer Raymond Loehr, who chairs the agency's Science Advisory Board (SAB), "it needs a

TWO REPORTS, TWO ADMINISTRATORS

In September 1990, a report from EPA's science advisory board ("*Reducing Risk*") suggested ways the agency could improve its process of setting priorities and allocating resources. In March 1992 an expert panel offered suggestions for improving EPA science ("*Credible Science*"). Here are some of their major recommendations, and the responses of EPA administrators William Reilly, who served under President Bush, and Carol Browner, appointed by President Clinton.

Recommendation	Reilly	Browner
REDUCING RISK		
Tackle the most pressing environmental problems first	Tried to include more people in preparing budget	Asked SAB for advice, plans public meetings
Reduce ecological risks in protecting human health	Set up ecological monitoring and assessment program (EMAP)	Increased funds for EMAP, may be linked to biological survey
Emphasize pollution prevention over cleanup	Raised profile of emissions control	Continuing initiative
CREDIBLE SCIENCE		
Do more studies on potential long-term problems	Began small global change program (GCP)	Continuing GCP
Appoint a science advisor to oversee an internal council of scientists	Named William Raub, created council	Searching for Raub's successor
Incorporate science early in the regulatory process	Planned increase in research to support regulations	Formalizing role for research in planning regs
Recruit half a dozen "world-class" scientists	Interviewed candidates	Blocked by Clinton's plan to trim payroll
Increase share of funding for university researchers	Slight increase	Continuing small increase
Ensure quality of agency science documents	Developed internal peer-review policy	Continuing policy

strong scientist or engineer in charge of its science base." Researchers say it's also time for Browner and a new ORD chief to define the role of ORD. "Should we be gap fillers or national leaders?" asks Murphy.

Scientists also feel EPA's regulations often don't reflect the latest research. "There's been a lot of concern that policy decisions are made, then analyses are done to support the decisions," says Wendy Cleland-Hamnet, deputy director of EPA's regulatory management and evaluation office. Much of the blame for this lies with Congress: About 70% of EPA's budget is spent on carrying out congressional mandates in a dozen major environmental laws that direct EPA to minimize public exposure to specific toxicants and carcinogens. "The statutes simply make no room for science," says Reilly, now a visiting professor at Stanford. "Congress has already made up its mind as to how it wants things regulated."

One classic example is the Delaney clause of the Food, Drug, and Cosmetic Act of 1958. The clause prohibits EPA from allowing processed foods to contain residue from any pesticide known to cause cancer in animals and humans—no matter how remote the cancer threat. EPA would like to find a way around the legislation, and in March 1991, an internal EPA report recommended risk assessors ignore kidney tumors that develop after certain chemicals trigger a physiological cascade unique to male rats. But if EPA were to ignore such toxicological data in drawing up a regulation, says an EPA pesticides staffer, "we'd be in court in an eyeblink."

Congress isn't always the culprit, however; EPA creates plenty of its own problems in applying science to public policy. Last fall, for example, EPA funded a study suggesting that cleansing the soil of lead, which affects cognitive development in children, was unlikely to reduce lead levels in their blood significantly (*Science*, 15 October 1993, p. 323). But EPA ignored the finding and decided that cleaning up heavily contaminated soil would "measurably reduce blood lead." The lead industry criticized EPA's analysis, as did the Alliance to End Childhood Lead Poisoning, which thinks that it is more important to spend money on removing lead-based paint. EPA hopes to release a revised analysis later this month. EPA's attempt to set a standard for radon in drinking water is seen as another example of scientific ineptitude (*Science*, 17 September 1993, p. 1514).

Many scientists were hoping that two major reports commissioned by Reilly on strengthening EPA science would enable Browner to get off to a fast start. The first, "Reducing Risk: Setting Environmental Priorities and Strategies for Environmental Protection," urged the agency to do a better job of anticipating environmental problems. In response, Reilly asked EPA scientists to do two things: put greater emphasis on prevention, and spend more money on hazards that pose the greatest threat to humans and the environment.

Reilly didn't stop there. He asked for a second report on the agency's scientific efforts, "Safeguarding the Future: Credible Science, Credible Decisions," which reaffirmed what outsiders had said for years: "EPA science is of uneven quality, and the agency's policies and regulations are frequently perceived as lacking a strong scientific foundation."

One of the committee's key recommendations was to appoint a science adviser. "You need somebody to tell the emperor that he or she doesn't have any clothes," Loehr says. Reilly chose William Raub, who had spent 25 years at the National Institutes of Health (NIH), including 2 years as acting NIH director.

Raub assembled a council of advisers from the program offices and ORD and asked it to draft guidelines to, as the report requested, "insure a minimum level of quality assurance" for all science used to support decision making. He is also given credit for improving communications between ORD and the program offices. "The science adviser is an experiment that has worked," says Carl Mazza, chief scientist in the air and radiation office.

Reilly also pressured officials to focus on the nation's most important environmental issues. Suddenly, scientists working on dioxin in water began thinking about controlling dioxin release from incinerators and cleaning up dioxin at Superfund sites as well. "I really wanted to make science central to the agency's efforts," Reilly says. "But I think a fair amount of change is still necessary."

A time to act

Browner is taking several steps to elevate the role of science at EPA. She agrees with Reilly that the agency should emphasize preventing pollution rather than just cleaning it up, and she has begun to make more rigorous the review of risk assessments generated in the program offices. In addition, Browner plans to create a senior science policy council that will include scientists and administrators, and she wants more outside advice on the agency's efforts to set spending priorities. And next month EPA will conduct a series of national forums involving local and state officials, representatives of industry and environmental groups, and other concerned groups.

Browner also plans to add a research component to EPA's method of developing regu-

lations by asking agency scientists what additional studies need to be done before program offices can propose a new rule. Such an "analytic blueprint" would improve the quality of a proposed regulation, she says, as well as strengthen the agency's ties to its constituency of scientists, environmentalists, and industry representatives.

But Browner has yet to act on several "Credible Science" recommendations, including the hiring of four to six "world-class" scientists for EPA's in-house research program and shifting more research dollars to academic researchers (who now receive an estimated 10% to 20% of the agency's research budget). She has also failed to ease problems caused by a crackdown on abuses by contractors that has sharply eroded the ability of scientists to do research (*Science*, 29 October 1993, p. 647).

Browner says the Administration's efforts to reduce the federal payroll have hampered her ability to hire scientists. And "one of my greatest frustrations" since coming to the agency, Browner says, is how much time EPA scientists must spend managing contractors rather than doing research. Both problems may soon be alleviated, however: *Science* has learned the Administration will let EPA hire more full-time employees in 1995, allowing Browner to convert some contract researchers into EPA employees and to fill other positions with outside scientists.

With the environment a key issue for Vice President Al Gore, the White House is keeping a close eye on Browner's progress. And despite a spotty record to date in reforming EPA's science, most scientists are rooting for Browner to succeed. "When I first met Carol Browner, I was overjoyed," recalls Walker. "I got the impression she really, truly cared about science at EPA." He pauses for several seconds, then adds, "I still believe she cares."

–Richard Stone

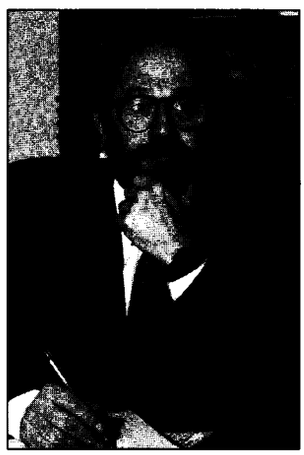
MOLECULAR BIOLOGY

Italy Throws EMBL Into Turmoil

Fotis Kafatos, director-general of the European Molecular Biology Laboratory (EMBL), seemed to be well on the way to securing the lab's future just before Christmas. In a meeting at EMBL's Heidelberg headquarters, the lab's 15 member states backed "in principle" Kafatos' plan to spread research funds around by establishing a network of small EMBL-sponsored groups at centers across Europe (*Science*, 17 December 1993, p. 1807). This was expected to be enough to satisfy some countries' concerns that they hadn't been getting their money's worth from their EMBL contributions. But on 28 December, Kafatos' New Year celebrations were ruined when the Italian government dropped a time-bomb into his lap: formal written notice of Italy's intent to pull out of EMBL—an unprecedented move that throws the lab's future into jeopardy, because Italy provides 12% of EMBL's $50 million annual income.

To compound Kafatos' problems, Italian Prime Minister Carlo Azeglio Ciampi resigned last week, dissolving his transitional government and making any rapid change of heart impossible. "I really cannot say very much," a bitterly disappointed Kafatos told *Science* last week. "The reality is that I'm gathering my thoughts, the thoughts of the lab, and—very importantly—the thoughts of the [national] delegates."

Italy had threatened to quit last year because Italian scientists are underrepresented among the staff at EMBL's headquarters. By launching his "regional groups" program with four labs in Italy (and another in Spain), Kafatos hoped to head off the Italian threat. That hope is now dashed, but Italy has not yet closed the door on EMBL completely. The withdrawal cannot take effect until next January, which gives lab officials some breathing space, and the Italian notice came with a statement explaining that the decision "is intended to stimulate, within Italy and EMBL, a wide-ranging and deep analysis" of the reasons for Italian scientists' low involvement in EMBL. This debate may, the statement goes on, lead to "a relaunching of Italian collaboration in the European framework, including more positive developments vis-à-vis EMBL itself." These cryptic words, say Italian sources, mean that if the lab offers Italy more than the four regional groups promised so far, then it might not leave. The problem, however, is that this will require more money, which EMBL doesn't have.



Fax campaign. Riccardo Cortese, trying to get the government to change its mind.

Italian research minister Umberto Colombo could not be reached for comment last week. But Arturo Falaschi, director of the International Center for Genetic Engineering and Biotechnology in Trieste, says that the offer of just four regional groups was the final straw. Falaschi says a figure of ten was discussed at a meeting in Rome last October with Kafatos and Bernhard Hirt of the Swiss Institute for Experimental Cancer Research, then president of EMBL's governing council. Hirt, however, denies that any promises were made. "There was no secret deal," he says, adding that it was made clear that the ten-group estimate assumed a 5% growth in EMBL's budget, which its member states refused to consider in December.

With little hope that the other EMBL states will agree to increase their contributions to accommodate Italy, EMBL lab chiefs have been asked to draw up contingency plans for 1995, assuming no Italian funding. As most of EMBL's budget is locked into salaries and cannot be cut, new initiatives—such as the European Bioinformatics Institute now being set up in Cambridge, U.K. (*Science*, 18 June 1993, p. 1741) and the planned expansion of the EMBL facility in Grenoble, France—could be severely squeezed.

Many Italian biologists are dismayed by these events. "Isolation is always the beginning of death," says cell biologist Jacopo Meldolesi, director of the Department of Biological and Technological Research at Milan's San Raffaele Hospital, who argues that Italian molecular biology needs to increase its contacts with EMBL, not sever them. Riccardo Cortese, a former EMBL program leader who heads the Institute for Research in Molecular Biology in Pomezia, near Rome, is exasperated that his government—having won recognition that Italy's future involvement in EMBL must be increased—has allowed the debate to degenerate into penny-counting. "The issue now is a much smaller and less noble one," he says.

Meldolesi and Cortese are spearheading an effort to get the decision to withdraw reversed, bombarding the research ministry with faxes and telegrams of complaint. But with the government now awaiting elections in March, it is unclear what effect that campaign will have. The elections are expected to decimate the number of seats held by Italy's discredited Christian Democrat and Socialist parties, probably leaving the former communists of the Party of the Democratic Left as the largest bloc in parliament. The best hope for EMBL, it seems, is that this new government will be keen on pan-European initiatives. The problem with the debate over EMBL's future, laments Hirt, is that national considerations take center stage: "The word Europe is never mentioned."

–Peter Aldhous