Who Rules French Science?

France's conservative government wants publicly funded researchers to concentrate on priority areas, mostly in applied research. Most researchers, however, are reluctant to play ball

PARIS—If the past 2 months are any indication, the French government has developed an exceptional talent for making researchers angry. In early February, more than a thousand archaeologists took to the streets here in the capital to protest a personal intervention by French Prime Minister Alain Juppé to allow construction of an apartment building over fragile ancient remains in the southern city of Rodez. Shortly afterward, Axel Kahn, one of the nation's most respected geneticists, resigned as head of the nation's genetic-engineering watchdog body after the government overruled that body's advice that growing transgenic corn is safe. And at a recent press conference here, Pasteur Institute virologist and HIV co-discoverer Luc Montagnier—who was identified as France's most admired scientist in a recent public opinion poll—angrily accused the government of "holding scientists in contempt" for passing a law that would send him and 100 of the nation's top researchers into early retirement.

French Government's priority themes for research:
Electronics and information technology
Transportation
Industrial chemistry
Food and agriculture
Product innovation
Medical research
Environmental technology

Plus: Earmarked funds for specific projects:
Biotechnology
Industrial chemistry
Infectious diseases
Gene sequencing

These public displays of anger are just the tip of an iceberg of resentment among French researchers, who widely regard the current politically conservative administration as being indifferent to basic science. The government has fueled this resentment by trying to focus public research funds on areas it considers high priority—a strategy becoming ever more common among France's European neighbors. Last autumn, for example, an interministerial committee chaired by Juppé himself announced a panoply of measures to harness the nation's research enterprise to serve the ailing economy and create new jobs (*Science*, 11 October 1996, p. 171). The committee defined seven "priority themes" for French science, all in areas of applied research, and the government decreed that some funds be shifted immediately into these areas. For many researchers, who have seen laboratory budgets dwindle in recent years, the new strategy was a slap in the face for basic science. And in the months since, while some researchers have sought to adapt to these new realities, others have issued calls to resistance.

"These seven programs are not totally silly," says mathematician Jean-Pierre Bourguignon, director of the Institut des Hautes Etudes Scientifiques in the Paris suburb of Bures-sur-Yvette. "But they are very shortsighted. I'm not sure we should stick so closely to what the man in the street asks for when deciding the future of science." Nor have researchers been assuaged by public statements by François d'Aubert, France's secretary of state for research, that the government wants to protect basic science. One high-level French researcher says privately that the nation's political leaders "don't care about science; they don't care at all," a view that was echoed by numerous researchers who spoke to *Science*.

"I am convinced that I am passionate about science."
—François d'Aubert

At the very least, the French government seems to have a credibility problem when it comes to its management of research: Since the conservatives took power in 1993, they have appointed three consecutive nonscientists to the post of research minister, and many researchers still wax nostalgic about the previous socialist government, whose longstanding research minister was noted physicist Hubert Curien. "There has been a real decline in the level of people in charge of research," says the head of a major French research institute, who asked not to be identified. "Curien and his staff were devoted and knowledgeable. The new bunch are political people and concerned with other things." Moreover, stagnating science budgets have meant that average spending for lab research has not kept up with inflation, and many labs have suffered deep cuts.

D'Aubert is a graduate of France's École Nationale d'Administration and was a deputy in the National Assembly from 1978 until he first joined the government in 1995, first as secretary of state for the budget and then, following a November 1995 reshuffle, for research. "It is true that I am not a scientist," d'Aubert said in an interview with *Science*. "But I am convinced that I am passionate about science." Among his distinctions have been the presidency of a commission looking into the Mafia's penetration into France and chairing a commission looking into the financially troubled French bank Crédit Lyonnais.

From the government's point of view, d'Aubert's talents in finance and administration were exactly what was needed to nudge French scientists into making their research pay off in economic growth. "We want to maintain the excellence of basic research," d'Aubert says, "but it is legitimate to define the policies and the goals, even if it isn't possible to say that one must arrive at a specific result." But his political credentials do not cut much ice with researchers. "Does d'Aubert give a damn about science, or does he just want us to stay within our budgets?" asks Harry Bernas, a physicist at the University of Paris's Orsay campus.

Fiddling with the margins

D'Aubert insists that scientists are overreacting to the government's measures. For example, one key goal announced by the interministerial committee is to increase the proportion France's sprawling public research agencies spend on priority areas. This means that basic research will lose, because these budgets have not kept up with inflation. In recent years, such special programs, normally defined by the agencies themselves, have amounted to 7% to 9% of the nonsalary components of the budgets of the CNRS and INSERM. Now the government has not only stepped in to say what these priorities should be, but has also asked the agencies to increase this figure to 10% in 1997, and to 20% in the coming years.

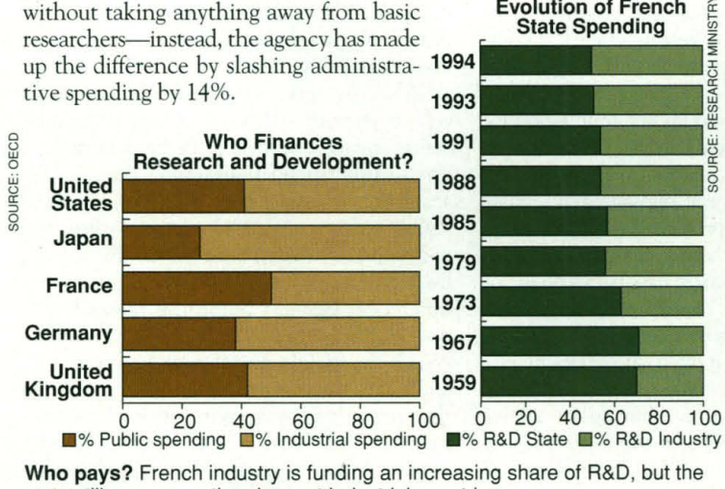
It is no surprise that these proposals were greeted with alarm. For researchers, public agencies such as CNRS and INSERM form the bedrock of basic research in France, where the state provides 50% of all research and development funds—a much higher proportion than most other industrialized countries. Moreover, unlike the United States, where most academic research is carried out

by university scientists, almost 60% of all state-funded science in France is performed in government research centers.

D'Aubert insists, however, that he is only talking about shifting a modest amount of money. "This is not at all authoritarian," he says. "Salaries make up 83% of the CNRS annual budget, so to increase incentives from 7% to 10% of what remains is really very little." But such arguments have backfired: To many scientists, the fact that such a small portion of agency budgets actually goes to support research is a big part of the problem. "No more than 3% of the [$2.3 billion] CNRS budget can be used for doing really new things," says chemist Pierre Potier, director of the Institute of the Chemistry of Natural Substances near Paris. The reason, he says, is "that you also have to pay overhead costs. Three percent is peanuts; it's crazy."

And Bourguignon, a CNRS career scientist, says that if the agency were forced to set aside as much as 20% of its research money for government-defined programs, "it would be absolutely disastrous." Indeed, many researchers appear to agree with Jean-Luc Rossignol, director of the 350-researcher-strong Institut Jacques Monod in Paris—a major biology center staffed mostly by CNRS scientists—who says that "the CNRS should not participate in this. I think the sole criterion should be the quality of research, because to favor some areas of science will be to disfavor others."

The mood is somewhat calmer over at INSERM, France's giant biomedical research agency, in part because medical research is one of the seven priority areas. "One can understand that a researcher would be worried about his freedom," says INSERM Director-General Claude Griscelli. "Yet these programs do not exclude the freedom to choose a research theme, especially in basic research. But once a discovery is made, we must minimize the delay between the discovery and its application." Griscelli says that INSERM has increased the portion of its research given over to priority programs from 9% to 11% in 1997, but without taking anything away from basic researchers—instead, the agency has made up the difference by slashing administrative spending by 14%.



Who pays? French industry is funding an increasing share of R&D, but the state still pays more than in most industrial countries.

France's Industry-Academe Jobs Agency

PARIS—Molecular biologist Jean-Roch Meunier went to work for the French cosmetics company L'Oréal in November 1995, just a few months after he finished his postdoctoral studies at the Weizmann Institute of Science in Israel. But Meunier never submitted a job application to the company. Instead, the company called him—thanks, Meunier says, to the Bernard Gregory Association (ABG), an organization devoted to finding jobs for young scientists in industry.

The ABG, which receives three-quarters of its $700,000 annual budget from government and the rest from industry, maintains a flow of résumés each year between its Paris offices and the roughly 100 companies that help support it. It also runs job recruitment pages on its Internet Web site (http://abg.grenet.fr/abg/). Although the organization was created in the 1970s, in the past few years it has been busier than ever as public money for hiring scientists has become ever more scarce (see main text). "I don't think there's a doctorate [holder] in France who doesn't know the association," says Sophie Degoy, who received her Ph.D. in materials science from the University of Paris and is now searching for a job in industry.

In the past, most of these doctorates would have found jobs in the universities or France's public research agencies. But many new Ph.D.s are now looking to industry out of necessity: The number of science Ph.D.s awarded increased from about 4400 in 1989 to 6700 in 1995, while recruitment in academic research remained stagnant. "Not all of the doctorates can reasonably hope to go into academic research," says ABG director Marc Joucla, an organic chemist. Joucla says one major obstacle to finding jobs for young scientists is the tradition in French industry of hiring engineers rather than doctorates. "They see us as supertechnicians," says Degoy, "who are mainly useful for applying particular techniques." Joucla says that industry leaders need to appreciate that a lab-trained researcher is someone who brings a wide variety of talents to a job.

To try to overcome some of these barriers, the ABG has begun to organize what it calls "doctoriales," seminars that bring together doctorates and industry representatives. But Joucla says that young scientists also need to maximize their employment potential. "When I speak to young people, they often talk of their thesis project, and I say, 'That only interests you and your thesis adviser.' If someone follows too narrow a path, he is going to be very disappointed. But if he broadens his approach from the very beginning, he will have a better chance." **–M.B.**

Turning to industry

As laboratory budgets have stagnated or fallen in recent years, many scientists have done exactly what the government wants them to do: They have sought contracts with industry. For example, while state spending on research and development, adjusted for inflation, has been falling steadily over the past several years, the value of industrial contracts awarded to public research centers has doubled since 1988, and currently stands at well over $500 million.

But the ultimate price of taking industry money can sometimes be high. "There are physics labs that survive only because they are more or less a research arm for an industrial group," says Bernas. "They get their equipment from the company, they do what the company is interested in, and they try to do some clandestine basic research on the side." On the other hand, Bernas says, labs working in areas of little interest to industry are threatened with extinction. "We will end up with a monomolecular layer of research in some areas and a lot of holes in other areas."

Faced with this prospect, French researchers have become increasingly outspoken in their objections to government policy, a trend that can be expected to continue. And it would appear that public opinion is behind them. According to a survey conducted for the research ministry last autumn, 78% of the French public believes that the state should be primarily responsible for funding research, and 72% stated that the government was not giving enough money to science. "We must protest from time to time, but that is not sufficient," says Rossignol. "Scientists must educate the politicians that basic research in itself is an investment for the future. We have a lot of persuading to do."

–Michael Balter