

Moving Mountains for French Research

France's universities and research system are in the midst of reform on a grand scale

Paris—GEOPHYSICISTS VINCENT COURTILLOT and Claude Allègre are used to studying large-scale upheavals, caused when massive forces reshape the landscape. Right now, they are in the midst of one such upheaval—but they're not just studying it, they largely set it in motion.

Two years ago, when the French government decided that a complete overhaul of the nation's universities was needed to fulfill its vision of France as the pre-eminent European technological power, it turned to Courtillot and Allègre, two science policy gurus, for advice. Partly on their recommendation, the government embarked on a massively ambitious program: construction of at least six new universities, an increase in university admissions to make them the highest in Europe, a doubling of the number of doctoral students by 2000, recruitment of 5000 university professors a year, and better conditions for research staff. It also stepped up competition for grants and encouraged closer links between the universities and the elite laboratories funded by the Ministry of Research.

The plan for the reform of the research system—known as the Courtillot plan—is still in its infancy, but it has already won admirers and outraged critics. Particularly controversial is a requirement that university research groups be evaluated so that big grants go only to the very best. This has already doubled some researchers' grants while cutting those of others almost in half. And the plan has also drawn complaints that it will undermine the autonomy of the universities and risk subordinating academic research to the agendas of the big laboratories, such as the famous CNRS and INSERM labs, run by the Ministry of Research.

Courtillot, who says his background in plate tectonics is "a good training ground for politics," is unmoved by the tremors he has unleashed in the research community. Indeed, he's busy ensuring that the reforms propagate through the system: He was recently made the head of DRED (Direction de la Recherche et des Etudes Doctorales)—a powerful Ministry of Education directorate created to carry out part of the overall reforms. Allègre is also in a position to push the reforms as special adviser to Education

Minister Lionel Jospin, his schoolfriend and political ally.

Until Courtillot assumed power over research at the Ministry of Education, university researchers were sheltered from the rigors of competitive peer review. In each university, Courtillot explains, the scientific council (a committee of professors) decided for themselves how the university's total research budget—received as a yearly block grant from the government—should be divided up. No longer. Each university now has to present an overall plan to the Ministry of Education, explaining what each research group will do. The groups are then evaluated through an international peer review committee (chaired by Nobel laureate Jean-Marie Lehn) and 30 specialist panels that rate each research group by the number of publications it has produced and its output of doctoral theses. Grants are then given out to individual research groups through a 4-year contract with the university, designed to give long-term stable funding to the most promising researchers.

The new system leaves the scientific councils with little real authority and many have protested that this has destroyed the autonomy of the universities. But Courtillot does not agree. "Autonomy does not mean self-evaluation," he says, claiming that the previous in-house reviews were open to abuse because they were conducted in secret. In any

case, says Courtillot, he has left the councils with a little power—they can spend 15% of the total budget as they wish.

This new system of contracts is not only novel—strictly speaking, it's also illegal. "It shocks a lot of people, including the Minister of Finance," says Courtillot. According to the law, parliament has to vote the national budget annually and the ministry cannot make long-term financial commitments. But since education and research are two of President François Mitterrand's national priorities, Courtillot is confident the law can be bent.

The new system has provoked both jubilation and disappointment as research groups

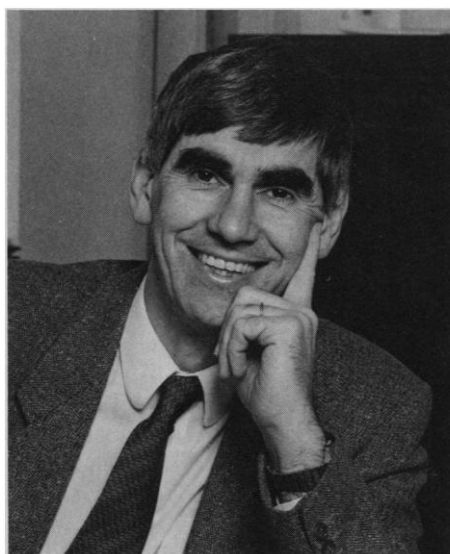


Second rate? The University of Paris VI protested when several of its research groups were rated poorly by expert panels.

have received news of raises or cuts. For those with the most savage cuts, the only option may be to seek new fields. Such a fate befell Christian Erhard, director of the birds and mammals department of the Museum of Natural History (which carries the status of a university). He says he saw his grant cut by over 40% and, recognizing that his own field of animal biology "is no longer fashionable," he says he will look for a new area

where he can use “molecular biology methods.” “We have the impression that grants are going to those who already have money,” he complains.

More than half the universities have now been assessed, but only one has put up a real fight—the University of Paris VI. Ironically it is located on the same Left Bank campus where Courtillot himself directed a laboratory of paleomagnetism and geodynamics. “The expert panels rated a lot of Paris VI groups poorly,” says Courtillot. “It is difficult to accept, but Paris VI, one of Europe’s biggest international universities, is headed by ‘C-level’ professors.” Not surprisingly the university wasn’t enamored with this judgment and simply refused to sign a contract. The ministry responded with a threat to cut the university’s budget by 20%. The standoff continued for several months last



Vincent Courtillot

year but in July—when most of the university staff were away on holiday—the university’s president caved in and signed the contract, accepting a smaller total cut.

Despite Courtillot’s enthusiasm, his plan may still have some rough times ahead, for it relies on the Ministry of Research to help galvanize research in the universities—and the ministry’s cooperation is far from assured. In a system unique to France, researchers are split into two groups: those who work at the universities (and who must also teach) and those who belong to one of the elite “grandes organismes,” like CNRS or INSERM, and receive their salaries and research budgets from the separate Ministry for Research and Technology. But the split is not total: Two-thirds of CNRS research laboratories are located on university campuses. In these “associated laboratories,” university and CNRS researchers work side by side, sharing facilities and grants.

Under the Courtillot plan, university staff working at these elite institutes are not evaluated. Instead, they automatically receive Ministry of Education grants on top of any money they get from CNRS. The logic of maintaining this favored group of university researchers, Courtillot explains, is that the links to the elite institutes will boost university research standards. The laboratories associated with CNRS or INSERM will become “the pillars of university research,” he says.

But this is not how the university professor’s trade union, SNESup, sees matters. By automatically giving elite groups access to Ministry of Education money, they fear that there will be nothing left for the others. Paul Mazliac, a member of SNESup and professor at the University of Paris VI, runs a laboratory of cell and molecular physiology that has the coveted CNRS-associated status. But, he points out, “the priorities of university research are different from those of CNRS, which have to follow the national strategy decided by the Ministry for Research.” By following CNRS priorities, he says, the Courtillot plan means that some universities “will no longer do any research in some disciplines.” The union also contends that professors are contractually bound to carry out research and it is thus illegal to deprive them of research money.

“The situation is serious,” says Jean-François Camus, a spokesman for SNESup, “but not necessarily from a financial point of view. It is the national status of lecturer-researcher which is threatened.” Up until now, all university lecturers have been encouraged to do research by being nationally recognized with the title *enseignant-chercheur*. In the long run, he fears, a two-tier system will emerge, with only those

An Academic Building Boom

While the French academic research system is being shaken up, the universities themselves are in the midst of the biggest building program since 1968, when the massive student riots brought down the government of Charles de Gaulle. This time it is not so much demonstrations that are driving change as it is the number of applicants—more students than ever want to go to universities and the government is encouraging the trend.

The average French citizen sees good education as a right: proof that the 1789 revolution really did bring *liberté, égalité* and *fraternité*. Unlike their counterparts in the United States, every lycée (high school) student who passes the national baccalauréat examination at age 18 has a right to a place at any of the 75 French universities.

That right is jealously guarded and woe betide any government that forgets it. In 1986, a right-wing government tried to grant universities powers to select their students. The result was a series of demonstrations and a bloody clash with police that left one student dying on a Latin Quarter sidewalk. The education minister was forced to resign.

Now students are seeking entry to universities in unprecedented numbers. Armand Frémont, director of planning and university development at the Ministry of Education says, “This year there are over 1.3 million students [entering universities] and numbers are rising by 8% a year, 10% in some regions. By the end of the century there will be 1.8 million, maybe 2 million.”

To cope with the demand, Education Minister Lionel Jospin is bankrolling a university building program to the tune of FF16.2 billion (about \$2.7 billion) over the next 4 years. Four brand new universities are going up outside Paris, and two others are scheduled for the depressed north of France.

But because most of the new buildings cannot be ready before 1995, today’s students face appalling overcrowding. Lecture halls at some Paris universities are so full that students sit on the steps, even in the corridors. At one campus there are only 500 seats in the library for more than 20,000 students. Many of the giant campuses scattered over France were built hurriedly in the early 1970s. Now, they are dilapidated and overcrowded, with no amenities and are often in far-flung suburbs completely cut off from city life.

Frémont is very critical of the earlier building bonanza and wants to avoid making the same mistakes. “Life on these campuses alternates between the crowd during the day and the desert at night,” he says. Now planners, sociologists, and academics are getting involved with architects in their design. Already there have been some whacky solutions to a shortage of inner-city sites. The ministry has requisitioned a disused army camp in Toulouse, a state cigarette factory in Lyons, a dockside factory in Dunkerque, and a hospice in Avignon.

■ P.C.

associated with CNRS with this status—the rest will simply teach.

The reaction to Courtillot's upheaval is not wholly negative, however. Jean Pailhous, director of the CNRS Cognition and Movement laboratory at the University of Aix-Marseille, for one, argues that the reforms were needed. "At last we have the impression that higher education has a research policy which complements the CNRS policy without replacing it or entering into conflict with it," he says. "Certainly, some people are probably unhappy, but they're not likely to be doing much research," says Pailhous.

Jacques Curie, professor in social sciences at the University of Toulouse II, is another supporter. By concentrating grants on the best researchers, he says, universities will no longer "under-optimize grant money." But he worries that the whole system could come unstuck.

"The links between CNRS and the Ministry of Education are fragile," says Curie. Just 2 years ago, Allègre, who had lost his campaign to become director of CNRS, was clashing swords with the successful candidate, François Kourilsky. Now, while Allègre



Claude Allègre

and Courtillot are trying to strengthen the links between the universities and CNRS, Kourilsky, backed by the research minister, Hubert Curien, is lending his weight to the

opposite policy of "dissociation."

To encourage growth in the provinces, Kourilsky says he will not associate CNRS with any new university laboratories in Paris. But Paris is just where Courtillot is spending extra money to give dynamic new research groups a special boost. By the time their 4-year Ministry of Education contracts expire, Courtillot expects these groups to have forged links with the CNRS. "It is obvious that if, after 4 years, these young groups come against a wall of nonrecognition by CNRS, there will be massive problems in higher education," says Pailhous.

After 50 years as the unchallenged leader of French research it is no surprise that CNRS is in no hurry to accommodate the universities. But that could quickly change. Allègre had been widely tipped to be the next minister of research. If that were to happen, the tectonic forces that have been driving the Ministry of Education and the Ministry of Research in opposite directions would rapidly diminish. ■ PETER COLES

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Mid-Course Correction at LBL Genome Center

Last week, Charles Shank, director of the Lawrence Berkeley Laboratory (LBL), announced that Berkeley geneticist Jasper Rine has been appointed acting director of LBL's troubled Human Genome Center. The announcement indicates that a controversial plan to run the center by committee (*Science*, 26 April, p. 500) has undergone a slight metamorphosis.

The center has been without a director since Charles Cantor stepped down almost a year ago. Finding a replacement, however, has proved tough. Earlier this year, when it became abundantly clear that LBL was not going to snag anyone of the caliber it wanted, like first choice Leroy Hood of Caltech, Shank and his advisers settled on an admittedly risky new strategy. Their solution was to appoint a top-flight committee to run the center while at the same time actively recruiting a handful of hot young scientists at the assistant professor level. The hope was that one of them would emerge as natural leader within a few years.

Rine's appointment does not signal a renunciation of the plan, insists geneticist Gerald Rubin of the University of California at Berkeley and one of the plan's chief architects. It simply reflects the "realization that there has to be someone on the scene to make the day-to-day decisions," he says. Several critics within the national laboratories made just that point when the plan first went public last April; indeed, they predicted it would fail.

Rine, 38, who was traveling and unavailable for comment, is a relative newcomer to genome research, though he entered with a bang about a year ago with an ambitious project to map the dog genome (*Science*, 19 April, p. 382). Rubin describes Rine as "committed to seeing the genome center succeed. He is also one of the smartest people I know." Rine was active in the search for a new center director and, indeed, is on the advisory

committee that Shank set up a couple of months ago to give overall direction to the genome center, along with Rubin and genome experts Leroy Hood, David Cox of UC San Francisco, and David Botstein of Stanford. Says Rubin: "We realized running the center takes more time than Hood, Botstein, and Cox can give." The committee, which will meet every 2 months, will still set overall policy, say both Rubin and Sylvia Spengler, who has been running the center since Cantor's departure, but it will be advising Rine and not Shank. Indeed, the committee is planning a 2-day retreat this July to hash out just what the center's mission should be—to figure out, as Rubin describes it, how to match the considerable resources at LBL with the unmet needs of the Human Genome Project.

Meanwhile, LBL has just recruited Michael Palazzolo, who comes from Maynard Olson's lab at Washington University in St. Louis, considered one of the best genome labs in the country. Palazzolo will bring a postdoc, Charles Martin, and two technicians from St. Louis when he arrives in July. "Palazzolo is exactly the kind of person we had hoped to get," effuses Rubin. "Things are going well. I am very optimistic. All we need are two more like Palazzolo and we will be on our way." ■ LESLIE ROBERTS



Jasper Rine

University of California