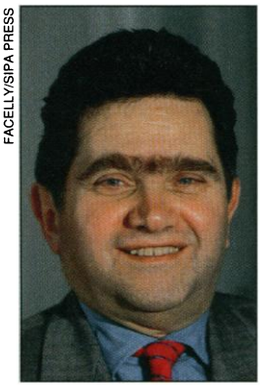
What Ails French Biomedicine?

France's research minister, geochemist Claude Allègre, has prescribed a tonic for French science. Top biomedical researchers, meeting in Paris last week, offered a variety of views on the diagnosis

PARIS—Among his colleagues in the French Cabinet, Claude Allègre is known as "The Volcano"—an allusion both to his stature as an internationally known geochemist and his occasional verbal eruptions. Since Allègre was appointed education and research minister by France's Socialist government last June, researchers have been cautiously optimistic that he would blast open some fissures in what many see as the nation's overly rigid scientific edifice. Last week, in a full-page article in the daily newspaper *Le Figaro*, Allègre set down his blueprint for reforming French science. Although his five-point plan (see table) may not amount to a major eruption, it sends a clear signal to scientists that Allègre expects research to serve France's national interests.



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Reforms are needed because "Europe is being eaten alive by American industries."

—Claude Allègre

Allègre got almost instant feedback from one sector of the scientific community: At a conference of France's leading biomedical researchers the following day—at which Allègre gave the closing address—his nationalist goal seemed to be widely shared. Nevertheless, as the daylong meeting* held in France's National Assembly also demonstrated, there's still considerable debate over how best to manage the delicate balance between basic and applied research. For example, over the past several weeks, hundreds of scientists at the National Institute for Health and Medical Research (INSERM), France's leading biomedical research agency, have signed a declaration criticizing Allègre's proposed reforms of the organization—which include giving its administrative council a greater role in setting research directions—as an attempt to "impose from above" research priorities.

At the conference, there seemed to be consensus at least on the basic problem: France, despite its long and proud history in biomedical science, has fallen considerably behind many other countries in making this research pay off in economic terms. "The role France plays in this area, while still significant, is deteriorating, as judged by the number of new drugs we are putting on the market," said National Assembly President and former Prime Minister Laurent Fabius in his opening address to the conference. "As for our biotech companies, their situation is often disturbing, if not downright bad." Fabius pointed out that the revenues of new biomedical research companies started up in France over the past 10 years are less than those in Israel. And Pierre Tambourin, former head of the life sciences department at the National Center for Scientific Research (CNRS) and now coordinator of Genopole—a genetic research complex in the Paris suburb of Evry, funded by both public and private sources and which includes France's new gene sequencing center—pointed out that France has fewer than 100 biotech companies, while the United States has about 1300. "We cannot remain in such an underdeveloped state," Tambourin said.

While the symptoms of France's malaise seemed clear to everyone at the conference, researchers offered a variety of diagnoses. Philippe Froguel, director of the human genetics department at the Pasteur Institute of Lille and a chief organizer of the conference, cited "the old-fashioned concept of valorization that CNRS and INSERM have had for a long time, which tries to patent, often clumsily, the discoveries of their researchers rather than put into place collaborative programs with industry." Froguel also criticized the "conformism in the academic milieu that points the finger at researchers who enter into contracts with industry and accuses them of making a personal profit from research supported in part by public money." And Alain Fischer, a physician-researcher at the Necker Hospital in Paris, argued that even when potential new drugs emerge from French laboratories, clinicians are slow to put them through effective clinical trials. "We are not well-trained at doing this, and the trials are often mediocre. AIDS is the only area in which things have progressed in France."

Several scientists also decried the lack of opportunities for young scientists, which has led to an increasing "brain drain" to the United States and other countries. But, Allègre argued, "they don't go abroad because they earn more money, but because they have more [scientific] autonomy. We must give more autonomy to young researchers."

Indeed, many scientists in France see the United States as the nation's main competitor and often regard the successes of American science with a mixture of envy and resentment (*Science*, 16 January, p. 312). "Europe is being eaten alive by American industries," Allègre said. In his *Le Figaro* article, the research minister went so far as to suggest the creation of a European scientific press agency, "to make known ... scientific findings made in Europe, and to counterbalance

ALLÈGRE'S PLAN FOR FRENCH RESEARCH

- Recruit young researchers to replace France's aging research cadre. More than 6500 positions for Ph.D.s will be created, especially in the public research agencies and universities.
- Debureaucratize public research agencies. Paperwork will be reduced and the number of committees and commissions will be cut.
- Better coordinate the research agencies and create interagency research programs. The research ministry will create coordinating councils in the life sciences as well as information technology.
- Step up efforts to make research pay off for France's economy. Public research funds will be made available to small, innovative companies, and a new National Center for Technological Research will orient some public research toward industry.
- Cooperate more closely with Europe. Harmonize university studies and increase exchanges of researchers and university professors between European countries. Create a European research press agency.

SOURCE: *LE FIGARO*

* "French Biomedical Research: What Policies for Which Ambitions?" Paris, 27 February.

American media propaganda, which inundates the media so much that it is sometimes unbearable."

But some researchers, while agreeing that France is lagging behind, counseled against trying to duplicate the American model. "Let us not try to copy some American companies that bring together hundreds of [researchers] and keep their eyes riveted on their stock prices on NASDAQ," Froguel argued. Instead, he said, the main priority should be to "give more muscle to public research" so that basic scientists can enter into collaborative research projects with industry—but only, Froguel added, "when it is desirable and possible."

Axel Kahn, a geneticist at the Cochin Institute in Paris who also serves as deputy scientific director for life sciences at the French pharmaceutical giant Rhône-Poulenc Rorer, warned that too great an emphasis on applied research could slow progress in biomedicine. "Most recent medical advances have come from academic research," Kahn said. "The future for finding new drugs lies in a powerful and effective basic research effort."

Whether Allègre will adopt this prescription for France's ailing biomedical research effort will be better known next month, when the government plans to hold a Cabinet meeting to define the priorities for all of French science. But in his *Le Figaro* article, the minister promises a "mobilization" of researchers, university instructors, industry chiefs, politicians, and others to revitalize the nation's research effort. Says Froguel: "We have in France all the human, technical, and financial resources necessary to develop interactions between public and private research, to serve science but also our economy. It is up to us to find the ways to make that work."

–Michael Balter

SPACE SCIENCE

Faster, Cheaper, Better Is Also Harder

Six months after losing the Lewis spacecraft in orbit, NASA last week canceled its intended companion, the Clark mission, before it even got off the ground. Agency officials blame themselves for failing to oversee the two Earth-monitoring projects adequately, but they say that the demise of these missions does not weaken NASA's resolve to build and operate smaller, faster, and cheaper robotic space flights.

The decision not to fly the $55 million Clark vehicle, scheduled for launch this spring after a 2-year delay, marks an ignominious end to a 6-year program designed to show that NASA flights could be accomplished for a fraction of the time and cost of past efforts. Clark's older sibling, the $71 million Lewis mission, lasted just 4 days before spinning out of control last August. NASA Chief Engineer Dan Mulville is leading a group that is sifting through the twin debacles to identify lessons for future missions.

The cancellation of Clark, a small spacecraft with a sophisticated high-resolution camera to scan Earth, came after several months of indecision at NASA headquarters (*Science*, 16 January, p. 318). Officials had long been unhappy with the performance of Orbital Sciences Corp. (OSC) of Fairfax, Virginia, the company that last year purchased the original contractor, CTA Inc. NASA officials cite OSC's failure to fix a host of technical problems and provide sufficient staff to handle those efforts as the primary reasons for the program's continuing delays since the CTA purchase.

But Bill Townsend, NASA's deputy earth science chief, and other agency officials say OSC should not shoulder all the blame. CTA was struggling with the project before it was taken over by OSC, say NASA officials, who admit the agency's own performance also was flawed. The project was initially run by the technology office at headquarters; when that unit was abolished, Clark was transferred to the earth science office. However, the former head of the earth science office, Sam Venneri, remained involved in his new job as chief technologist. The confusing arrangement undermined what was to be a lean and mean management machine. "We learned that we can't expect the contractor to manage the project with just a little NASA oversight," one official says. Venneri was traveling and could not be reached for comment, but Townsend says, "This was a bold management experiment to get out of the oversight business. But with 20/20 hindsight, we did not do a good job."

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Rocky mission. Meriwether Lewis spied the Rockies, while NASA's Lewis and Clark fell short of scanning the entire planet.

NASA is anxious to avoid a costly legal battle with OSC, which one agency source gripes "has more lawyers than engineers." Faced with the possibility of a suit for reneging on the contract, and lacking an ironclad case against the company, NASA canceled Clark at the "convenience of the government." That phrase means NASA is not officially blaming OSC and will not try to recoup any costs. "It's a very unfortunate learning experience," says one chagrined NASA official. OSC spokesperson Barry Beneski declined comment.

NASA will keep the spacecraft hardware and instruments, now at Goddard Space Flight Center in Greenbelt, Maryland, and cannibalize them for use in other programs, says Townsend. "They own the satellite—they bought it—and they can use it as they see fit," says Beneski, who adds that the company has dropped any plans to sue. The agency intends to use the Lockheed Martin Athena rocket to launch another NASA mission.

An independent inquiry into the failure of the Lewis spacecraft, which is due for release soon, has also apportioned blame between NASA and a contractor. NASA sources say the inquiry faults TRW Inc. for technical flaws in the attitude control system that left the spacecraft vulnerable to instability. Those sources add that the inquiry also criticizes TRW for leaving the control room unattended overnight, when the spinning began. Had the control center been staffed, NASA officials say it is possible the satellite could have been rescued.

TRW spokesperson Sally Koris declined comment, pending release of a report by a panel chaired by Christine Anderson, space vehicle director at the Air Force Research Laboratory in Albuquerque, New Mexico. Sources say that the inquiry also will criticize NASA for not providing sufficient oversight of TRW's efforts. The agency, for example, was not aware of the company's staffing plans for the control room until after the launch. "Our problem was that we had too small a management team," one agency official says.

Anderson's report upholds the faster, cheaper, better philosophy espoused by NASA Administrator Dan Goldin, the sources say, but finds that neither NASA nor TRW had a clear understanding of how to put it into practice. It also faults headquarters for trying to manage the effort. Townsend says that NASA hopes to share with industry the findings of Mulville's panel on lessons learned from Lewis's failure and Clark's termination.

–Andrew Lawler