

France Plans Increased R&D Spending

Paris. As the French government begins to prepare for a general election next March (which it currently seems almost certain to lose), it remains committed to a significant increase in funding for research and development. The Minister for Research and Development, Hubert Curien, has announced that spending by government departments on R&D will reach a total of 42.5 billion francs (\$5.2 billion) next year. With an anticipated inflation rate of 4 percent, this translates into a planned real growth of 4.2 percent—and compares with the zero growth that is being imposed on public spending overall.

Even more significant are a number of indirect measures to boost research spending in the private sector. In particular, the government is proposing that tax credits on the new research and development efforts of industrial companies be raised from 25 to 50 percent.

These proposals may prove to be excessively optimistic. Already France has fallen short of its 1982 target of raising national expenditure on R&D from 1.8 percent of the gross national product in 1980 to 2.5 percent by 1985. Despite significant increases, the real figure for the current year turns out to be 2.29 percent.

However, Curien describes this as "quite close" to the original target—certainly close enough to be used as evidence of the government's commitment to "modernization and industrial competitiveness." Similarly, according to Curien, given the further increase being proposed for next year, there is "nothing magical or mystical" about the new target, adopted by law in June, of achieving 3 percent by 1990.

Within the overall R&D budget, spending on nuclear R&D will be kept at its current level. In contrast there will be significant growth in R&D spending in the fields of aeronautics and space, with budget increases of 33.6 percent (to \$236 million) and 21.0 percent (\$380 million) respectively. The former will be needed to cover the continuing development costs of the European Airbus, the latter to meet both existing commit-

ments, including the development of a new version of the launcher Ariane.

Increases of this magnitude have been made possible largely by the completion of most of the capital construction work for Paris's new science and technology museum.

Another field where completion of the museum will reduce pressure on the rest of the research budget is on scientific manpower. This year, the government has created 1700 new jobs paid for out of the research budget, but admits that a high proportion of these have been absorbed by new posts at the museum. Next year, the bulk of the new jobs being promised—a total of 1400, including 725 research scientists and engineers and 675 technical and administrative staff—will be allocated to research institutions.

Although the government has, in the past, made various attempts to increase the mobility of scientists, seeing the resistance to move between different organizations as one of the main stumbling blocks of French science, Research Minister Curien admits that "it would be dishonest to pretend that 1985 was a good year for mobility." The problem, says Curien, no longer lies in administrative barriers, but in the difficulty of creating "a climate and a psychology, particularly in promotion committees, so that everyone is convinced that moving around is a good thing to have done, not a sign of instability."

Another priority that the government has adopted is the need to increase support for research in universities, where many scientists have been looking with some envy at the relatively generous budgets awarded to government research laboratories.

In 1986 "the growth will be equal" says Curien, adding that "there will be no disparity in funding between the two sectors," and that "I do not want the idea to develop in universities that they are not being treated as well as public research institutions."

Finally, Curien announced that the government had agreed to commit 1 billion francs (\$121 million) in 1986 to high technology projects to be carried out with other European countries within the framework of the Eureka program, which was proposed by the French government earlier this year and accepted at the European summit meeting in Milan in June (*Science*, 12 July, p. 141).—DAVID DICKSON

Plants Can Be Patented Now

Genetically engineered plants, seeds, and tissue cultures can now be patented as a result of a recent decision by an appeals board of the U.S. Patent and Trademark Office. Representing a reversal of policy, the decision is regarded as a boon to the agricultural biotechnology industry.

Previously, new types of plants were only narrowly protected by two federal statutes. Under these laws, if a plant variety was genetically modified, for example, by the insertion of a specific disease-resistant gene, a plant breeder could only obtain protection for the specific variety, even though the modification could be applied to thousands of other varieties. The appeals board decision now allows a breeder to patent generically all varieties with the change, according to patent office official Charles Van Horn.

In the case before the appeals board, a Minnesota biotechnology company was seeking patent protection for corn plants, seeds, and tissue culture that had been modified to overproduce tryptophan, an amino acid and nutrient in animal feed. "We have a basic invention that is now protected for all corn, no matter what the variety," said Leslie Misrock, the patent attorney who represented Molecular Genetics Research and Development Limited Partnership.

Plants could not be patented before because it is impossible to describe plants with the same specificity as a machine, and because it is impossible to create a new plant only from a written description. Advances in genetic engineering, however, now allow breeders to describe their inventions more precisely.

Misrock noted that one difficulty the company encountered is the lack of depositories that have the facilities to maintain plant material. To obtain a patent, the application must enable others to duplicate the invention. So it was crucial to find a depository for its modified plant material. The American Type Culture Collection, for instance, lacks the necessary facilities as a plant depository. The company eventually found a depository, In Vitro International, Inc., in Ann Arbor, Michigan.—MARJORIE SUN