France Boosts Biotechnology

London. The French government has announced an ambitious 3-year plan aimed at increasing the nation's share of international biotechnology markets from 7.5 to 10 percent by 1990. The plan, which was unveiled in Paris last week, includes an increase of more than 25 percent in government support for research related to the future needs of the biotechnology companies next year, with even greater increases in the years to follow; at present, such support is about $160 million.

The plan has been drawn up by a special commission of 23 government officials, scientists, and industry representatives established last year by M. Jean-Pierre Chevènement, then minister for science and research, and headed by Pierre Douzou, president of the scientific council of the National Institute of Health and Medical Research. Late last month, Chevènement was promoted to become head of the ministry of industry, at the same time retaining his original responsibilities for research. The commission's recommendation for a substantial increase in government support for biotechnology has been adopted as the first of seven programs through which the new "superministry" intends to stimulate rapid science-based economic growth.

The report explicitly compares the current state of French biotechnology—interpreted to cover a broad range of industrial applications of biological processes—with the situation in both the United States and Japan. It points to many gaps in France's current research and development program which, it says, need to be filled if the nation is to increase its share of the world market in biotechnology.

Three categories of research are identified as essential to this effort: fundamental research on the "acteurs" of biotechnology, such as microorganisms, cells, and enzymes; the study of biological reactions and their applications; and research in related areas such as pharmaceuticals and agriculture. The members of the commission say that the first and third categories are well in hand, but that the second category "which corresponds to biotechnology in the strict sense has hardly been touched upon." They have therefore provided a list of research projects needed to remedy the current lack of effort.

Chevènement is proposing that increased government funding be matched by a higher level of support for biotechnology research from industry, suggesting that this be encouraged by measures such as tax credits and preferential loans to companies that raise their R & D spending. The report also recommends efforts to improve the transfer of ideas from the laboratory, and to speed up the training of biotechnologists. These are now being studied by the department of education.

Future government efforts will be guided by a national committee of representatives of both "economic and social" constituencies which will meet twice a year to suggest policy directions and evaluate the actions that have been taken. This committee will be chaired by Chevènement; Douzou will act as his vice-chairman.

—David Dickson

Ethics Panel Looks at Human Gene Splicing

Two years ago representatives of the country's leading religions asked the President's Commission for the Study of Ethical Problems in Medicine and Biomedical and Behavioral Research to address the prospect that "we are rapidly moving into a new era of fundamental danger" triggered by gene-splicing technology. The commission's response is a report, the draft of which was aired at a hearing held in Washington last month.

It basically addresses two potential "direct human applications." One is gene therapy, by which is meant replacement of a defective gene—such as the gene to produce insulin—in somatic cells. The other is gene surgery, which means intervention that would affect human germ cells and hence the genetic makeup not only of the individual but of all his descendants. The report raises—but does not answer—a variety of awesome questions relating, for example, to the nature of humanness, the future responsibilities of parents if it becomes technically possible to eliminate genetic defects in utero, and the propriety of creating hybrid part-human forms of life.

Crossing interspecies barriers—by inserting a human hemoglobin gene into an embryonic mouse cell, for example—is not regarded in itself as problematic. The difficult question, rather, is whether such transactions could involve manipulation of characteristics that are regarded as uniquely human. This, suggests the report, is what people are really afraid of when they express concerns that gene splicing is "playing God." But the commission declined to predict whether this would ever be possible. The answer, it says, cannot be determined until mankind has a much clearer idea of "what is natural to man" and what human characteristics are the product of his environment.

Meanwhile, in answer to the churches, the commission wrote that it "does not see in the rapid development of gene splicing . . . 'fundamental danger' to world safety or to human values."

The panel drew some criticism from author and *New York Times* editorialist Nicholas Wade, who was invited to testify at the hearing. Wade thought commission members were ducking their real responsibilities. He said they ought to come right out and admit that one day scientists will come to a full understanding of the workings of life and will therefore be in a position to alter the nature of man—however that may be defined. He suggested that it is therefore the commission's role to look into the far distant future and discuss setting some firm guidelines. A possible one, he said, would be drawing the line at intervening in human germ cells and thus with the course of human evolution.

But Wade's immediate concern was what he saw as a trend toward "revisionism" of recent history. He thought he saw in the report "a reflection of the vested interest of scientists" who felt the whole gene-splicing debate of recent years had been a big annoyance and who wanted to soft-pedal the long-term potential of the technology in hope of avoiding further public debate. "Scientists will speak readily of the miracles awaiting us in the industrial sphere," he said, "but before a panel of ethicists they put on quite a different hat and dismiss as

0036-8075/82/0806-0516$01.00/0