

Court rules against gene-splice field test

In a decision that surprised plaintiff and defendant alike, U.S. District Court Judge John J. Sirica last week granted a temporary injunction against a University of California agricultural experiment planned to begin May 25. The field test—which would have constituted the first deliberate release of recombinant DNA—entails spraying a row of potato plants with bacteria genetically engineered so that they do not trigger ice formation and thereby may prevent frost damage of crops (SN: 4/28/84, p. 269). The university is appealing the District Court decision, and the Court of Appeals is expected to consider the case by May 25.

"The decision caught all of us by surprise," says Bernard Talbot of the National Institutes of Health (NIH). "Everyone left the courtroom thinking we [the defendants—the government and the University of California] had convinced him [Sirica]."

"Yes, I was surprised at the decision," says plaintiff Jeremy Rifkin of the Foundation on Economic Trends. Rifkin is a social activist and long-standing critic of genetic engineering. "I'm always surprised when anyone agrees with me, especially in the government."

The District Court decision goes beyond the particular experiment. It also forbids the federal committee that considers genetic engineering experiments—the Recombinant DNA Advisory Committee (RAC) of the National Institutes of Health—from approving the deliberate release of organisms containing recombinant DNA in experiments at institutions receiving NIH funding. This prohibition, unless overruled, will be in effect until the court holds a full hearing.

However, the court has not barred RAC from approving experiments voluntarily submitted for review by private corporations. Two such experiments are scheduled for discussion at its meeting on June 1. In a letter to NIH officials, Rifkin has requested that the RAC postpone this consideration, "so that such proposals will be treated in the same manner as those submitted by NIH-funded entities."

NIH's assessment of the potential environmental impact of "deliberate-release" experiments is the crux of the court case. Sirica strongly suggests that, unless overruled in an appeal, he will require NIH to conduct a formal, full-scale environmental assessment of their "program" for approving deliberate release of genetically engineered organisms. This assessment is expected to take a year or more and would postpone university experiments both in agriculture and in environmental destruction of toxic substances.

The judge stated that he reached his decision not on the basis of speculation

on the benefits and hazards of genetic engineering but on the "narrow, legal questions" of whether the NIH should have issued an environmental impact statement—which it did not—for deliberate-release experiments. Talbot says, "It's great that he said up-front he wasn't going to judge the science. But [in the opinion] there was still an intimation he thinks risky things are going on."

NIH argued that no environmental impact statement was necessary because the agency's approval of these experiments does not fall in the category described by the 1970 National Environmental Policy Act (NEPA) as "major Federal actions significantly affecting the quality of the human environment." So far only three deliberate-release experiments have been approved, and none have been carried out. These approvals do not constitute a program, NIH argues. Moreover, the RAC and the director of NIH were convinced in each case that there would be no significant environmental impact.

The plaintiffs convinced the judge that, as he put it, "the informal, ad hoc nature of the RAC review process cannot be a substitute for a careful, written environmental document identifying important issues for NIH consideration." Sirica says that when an agency, such as NIH, chooses not to follow the steps outlined in the NEPA, the court is not required to reconstruct the deliberations of the agency to determine whether environmental effects have been given adequate consideration. But William A. Anderson, the attorney representing the University of California, says that Sirica "somehow overlooked" the standards and procedures NIH *did* apply, which followed specifications of the Department of Health and Human Services. Anderson expects the Supreme Court to be asked to review the appeals court decision, whatever it may be.

Rifkin says this case will be the key to starting a national debate on the regulation of biotechnology: "It's chaos here in Washington. Nobody knows who's in charge."

Meanwhile, progress is "super" on a competing approach to the frost problem, says Robert J. Hunter, president of Frost Technology Corp. of Norwalk, Ct. Field tests are beginning on the application of a natural virus that kills ice-nucleation bacteria. Because no recombinant DNA is involved, these tests do not require any federal approval. While any delay in the development of the competing strategy seems likely to work to his company's advantage, Hunter worries that the controversy will "give any sort of work with frost a bad name."

—J. A. Miller

Coming: The era of automated workers

Rapidly developing computer technologies aimed at enhancing efficiency will both depress and alter the job market for about 80 percent of the 19.9 million people employed in manufacturing fields, says an Office of Technology Assessment (OTA) report released this month.

"The potential long-term impact of programmable automation [computer uses in manufacturing, also known as PA] on the number and kind of jobs available is enormous and it is essential that the Federal Government, educational institutions, and industry begin to plan with these considerations in mind," the report states.

The OTA predicts little short-term effect from increasing computer uses in factories before 1990. Then, the overall trend will be a shift from "manual to mental" labors, and possibly more unemployment in states where metal working is based, the report notes. Government, educators and industry must plan now to retrain those workers likely to be phased out, such as machinists or tool and die makers, say the report and experts in this area of study.

"I hope we don't come across as prophets of doom. It isn't going to translate into massive unemployment," says Marge Blumenthal, OTA project director for the report, "Computerized Manufacturing Automation." However, Blumenthal adds, "If there's no retraining and the economy's in bad shape, you better believe there'll be unemployment."

PA in manufacturing goods includes designing with the help of computers, manufacturing with robots or computerized machines and using computers to aid in management tasks such as payroll. The federal government this fiscal year is investing \$80 million into researching and developing PA.

Such automation will increase manufacturers' demands for engineers, computer scientists, technicians and adult education teachers. But for craftworkers, factory operators, laborers and clerical workers—the bulk of manufacturing employees—demand will shrink, says the OTA.

Meanwhile, researchers from Stanford University predict that new technologies will do little to increase the job market, with the so-called high technology industry itself employing relatively few people. The demand for caretakers, cashiers and secretaries will be almost 14 times higher than the job demand for computer service technicians between 1984 and 1995, researchers there estimate.

Besides the retraining issue, Blumenthal says the government also should study computers' impact on the workplace. Higher stress is expected, and the OTA speculates that workers may also face boredom as computers take over their former responsibilities and chal-

lenges.

OTA recommendations are: fighting U.S. "functional illiteracy" in basic reading, science and math skills; immediately implementing job training, retraining and counseling programs for workers displaced by PA; cross-training or teaching workers a variety of job skills; developing better education and career guidance programs for both youth and adults; and fostering overall improved worker training in new technology through an orchestrated effort by government, industry and educators.

This OTA report will serve as background information for Congress members who must vote on legislation related to computer advances. For example, a House Committee on Science and Technology subcommittee this month will consider a bill that would create several centers for industrial technology (to study robotics and PA) and also create a federal robotics center under the National Bureau of Standards. One committee aide says, "As we move ahead on legislation, [the OTA study] flags areas where we need to study more."

This week a National Academy of Science committee released a report saying that future high school graduates need strong math, science and reading skills in order to compete in a job market changed by technology. And members of the Committee on Science, Engineering and Public Policy also note that these graduates will face life-long returns for more schooling to keep pace with high-tech advances and thus remain employed, says Markley Roberts, one panel member and an economist with the AFL-CIO.

"It's going to be a tough, competitive job market for a long time," says Roberts. "We are very concerned with job losses over the long run."

Blumenthal says no one can accurately predict exact job losses or shifts in the work markets because neither the future economy, retraining efforts, nor the need for entry level positions can be predicted.

—A. Rowand

Copyright for chips?

The U.S. Senate has passed a bill providing 10-year copyright protection for the masks — original, stencil-like forms — through which each precisely designed and integrated layer of circuitry is written onto a semiconductor integrated-circuit chip. A similar bill is expected to pass in the House of Representatives soon.

Both bills provide protection against copying the original masks as well as the unauthorized production of chips made from registered masks. However, "reverse engineering" — the dissection and layer-by-layer reconstruction of a chip to see how it achieves its electronic functions — is allowed. □

Ancient Maya tomb discovered

An untouched, perfectly preserved 1,500-year-old Maya tomb — adorned with elaborate wall paintings and an intact male skeleton — has been uncovered in the dense jungles of northeastern Guatemala. The find, announced this week by the National Geographic Society, gives researchers a dramatic, unusual view of the Early Classic period of the advanced Maya Indian civilization that flourished before disintegrating rather mysteriously 500 years ago. The tomb, dated between A.D. 450 and 500, also contained 15 ceramic vessels and several carved jade beads.

The May 15 discovery by a joint United States-Guatemalan expedition — financed by an emergency grant from the Society — occurred near the Rio Azul (Blue River) in Guatemala's Peten Region. The tomb is

part of a temple complex among hundreds of buildings in a 500-acre Maya settlement. Last year, the scientists discovered the capstone of the tomb beneath a pyramid that also housed another tomb, called No. 1, which was believed to be the burial place of a ruler of the civilization. But unlike that tomb, this latest chamber has not fallen prey to looters. The resulting treasure chest of artifacts — the first such untouched find in 20 years — has both surprised and elated the researchers.

"It's a major tomb," says R.E.W. Adams, expedition director and professor of anthropology at the University of Texas at San Antonio. "Because it's associated with ... 28 looted tombs, [it] gives the other tombs historical significance. It gives us more data on an Early Classic ruling family which seems to have been associated with



Photos: National Geographic Society

The newly discovered Maya tomb contained the skeleton of an "administrator." Paintings adorn the limestone walls and pottery is scattered on the floor.