SCIENCE NEWS of the week

Crossroads for Gene Regulation

A U.S. Court of Appeals decision cut short the tightly scheduled meeting this week of the major federal advisory committee on gene-splicing research. The court said the committee had not followed appropriate government procedures in announcing that part of the meeting was to be closed to the public. Therefore the court prohibited the group from considering a California biotechnology company's proposal to field-test genetically engineered bacteria intended to control frost damage in plants.

Such litigation is one of a series of legal and political challenges, as well as scientific decisions, the National Institutes of Health recombinant DNA advisory committee (RAC) faces as fast-moving research propels the gene-splicing technique into new arenas — human gene therapy and, in agriculture, deliberate release into the environment of genetically engineered organisms.

In its more traditional role, the setting of laboratory requirements for work with spliced genes, the committee this week voted 8 to 4 to allow, under moderate restrictions, controversial work with a gene that produces a toxin found in bacteria causing Shiga dysentery. This serious diarrheal disease is widespread in developing countries.

The toxin had previously been classified with deadly toxins like botulinus, but recent data indicate the Shiga toxin gene occurs naturally in several types of bacteria, may move between microorganisms in nature, and is not always associated with illness. Scientists also argued that such work is essential also for the completion of work on an inexpensive vaccine against cholera.

The decision, requested by scientists at the Uniformed Services University of the Health Sciences in Bethesda, Md., was opposed by an outside group on the grounds that the work was a "program involving technology with potential military application" and as such required an Arms Control Impact Statement to comply with the Arms Control and Disarmament Act. The protesters, including Paul Warnke, former director of the Arms Control and Disarmament Agency and Rep. Ronald V. Dellums (D-Cal.), were led by Jeremy Rifkin of the Foundation on Economic Trends, the group that has brought the lawsuits against the actions of the recombinant DNA committee. Rifkin argues that work designed to produce vaccines could be easily used for biological weapons development.

A new arena for the committee is the oversight of future genetic engineering in humans. Such a responsibility had been suggested by the 1982 report of the President's Commission for the Study of Ethical Problems in Medicine and Biomedical and Behavioral Research. As an initial step in assuming such responsibility the Recombinant DNA Advisory Committee at the Feb. 6 meeting voted to add to their guidelines a section requiring the committee's review and approval by the National Institutes of Health of "deliberate transfer of recombinant DNA or DNA derived from recombinant DNA into human subjects."

The addition to the guidelines states that such review does not preempt any other required review of experiments with human subjects. Committee member Susan K. Gottesman of the National Institutes of Health in Bethesda, Md., says, "This makes it explicit that this group and others will look at these experiments." At least two proposals for gene-splicing in humans are expected in the next year. The committee did not act on a proposal by Rifkin to restrict therapy to non-reproductive, rather than sperm and egg, cells.

It is a major shift for the committee to consider experiments that would deliberately put products of genetic engineering into the human body. Originally the group focused on laboratory safety to ensure that biological material containing recombinant DNA would be kept out of people. It is a similarly great change for the group to evaluate plans for deliberate release, rather than the laboratory containment, of genetically engineered organisms. The early guidelines had categorically prohibited any release.

The committee has already approved release of genetically altered organisms in three cases of university research, two involving plants and one involving bacteria (SN: 10/15/83, p. 247). None of these field experiments has yet been done (SN: 8/27/83, p. 132).

Such release, essential for agricultural applications, is beyond the jurisdiction and expertise of the committee, critics claim. Rifkin says, "As long as [the RAC] is as it is, all of their authorized releases are unlawful."

A congressional report just prepared states: "The NIH RAC is currently the only federal entity with active responsibility for evaluating risks associated with research-scale field work. The RAC's limited jurisdiction, focus and membership, however, make it ill-equipped to address the environmental risks posed by large-scale releases by commercial biotechnology firms. It is also not prepared to cope with the question of confidential business information or with the number of applications for releases anticipated."

In their report, the House of Representatives Committee on Science and Technology Subcommittee on Investigations and Oversight, chaired by Albert Gore Jr. (D-Tenn.), recommends that the NIH should at this time permit no deliberate release. The potential environmental effects of the release should be considered by an interagency review panel, which the report recommends be assembled. This panel should oversee deliberate releases until the Environmental Protection Agency assumes responsibility, as it has announced it plans to do (SN: 8/20/83, p. 119).

A recent report of the Office of Technology Assessment also pointed out the RAC's limited jurisdiction. The committee considers only one technique — recombinant DNA — of several that can be used to modify genes. Although researchers customarily ask RAC for approval, in many cases its decisions are not legally binding on those not receiving funds from NIH, and are not binding on industry. The Gore subcommittee report points out that there is no appeal or review of RAC decisions and no legal requirement that they not be arbitrary or capricious.

"[RAC members] should continue doing what they are doing," says Harvey Price, executive director of the Industrial Biotechnology Association in Washington, D.C. Other industry sources agree. They say RAC has technical expertise in genetic engineering plus political savvy, and it is an economical and efficient government body.

Irving Johnson, vice president of research for Eli Lilly and Company of Indianapolis, says RAC watches over academic laboratories, so why shouldn't it watch over industrial ones? He adds that the basic science of gene splicing is the same for microorganisms and plants, so why shouldn't RAC oversee plants? And NIH keeps grant proposals secret, so why shouldn't RAC keep proprietory information closed, asks Johnson.

At the Feb. 6 meeting the committee discussed whether it is the proper body to consider matters outside of health. Bernard Talbot, deputy director of the National Institute of Allergy and Infectious Diseases, says, "A lot of people are wondering what we are doing out on this limb. ... It seems far away from the [NIH] mission."

Members of RAC argue that the committee is valuable as a single focus for expression of public concern and, by dealing with all recombinant DNA work, it prevents gaps in the supervision of the research. Gottesman says, "What we do here doesn't prevent other groups from looking at it [genetic engineering research] at the same time. It doesn't make any sense for us to pull out...until something else is in place."

Referring to the lawsuits against RAC actions, committee member Gerald J. McGarrity of the Institute for Medical Research in Camden, N.J., says, "The future will be decided by the legal system more than by the people around this table."

—*J.A. Miller* with *J.C. Amatniek*