tively forthcoming with funds. The AAMC, for example, has avoided a hard line on the Guadalajara clause, though its constituent schools are restive.

Because of multiple uncertainties, current proceedings have a certain Lewis Carroll quality. The first crop of USFMS's to fill positions reserved for them under the new federal law are scheduled to enroll a year from September. (A suit seeking to speed up the process by a year was recently lost in federal court in Philadelphia.) The Secretary of Health, Education, and Welfare is charged with identifying students eligible under the new provision. The deadline for applications is 1 August and, when HEW has them sorted out, it will be clear just how many students are eligible, a question that has kept some medical school officials in a state of nerves. The schools will then reserve positions as apportioned to them by the Secretary. Students will apply to the schools of their choice, and participating schools will list applicants in order of a school's preference.

Students must apply by 15 December, and a "match" of applicants and schools is to take place in March, with the HEW Secretary acting as matchmaker. A list of unfilled reserved positions will then be published, and students not then admitted may seek the unfilled positions.

It may all sound logical and orderly, but the first trial of the new and complex process is expected to produce problems for everyone involved. One major complication, of course, is the stance of the medical schools who say they will forego the capitation payments and not take their quota of USFMS's unless the amendment is modified. These schools are apparently applying for the capitation grants in the hope that the law will be changed by March. The chances of that occurring are judged uncertain. Rogers is planning to introduce separate legislation to effect the change he seeks, and it is difficult to predict what will happen as such a measure passes through the committee process and floor debate.

As things stand now, it appears that even if the provision is modified, for the next 3 years the HEW Secretary will chair the most influential medical admissions committee ever.—JOHN WALSH

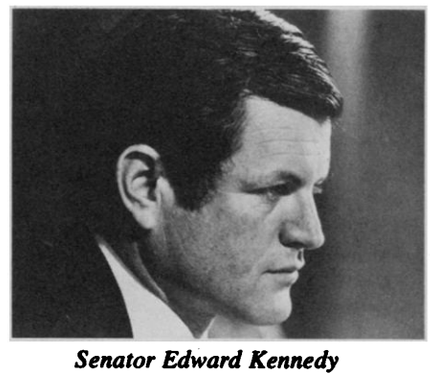
Gene Splicing: Senate Bill Draws Charges of Lysenkoism

Considerable friction has been generated between Senator Edward Kennedy and part of the scientific community over the issue of recombinant DNA research. "It smacks of Lysenkoism," says a senior scientist of the legislation drafted by the staff of Kennedy's Senate health subcommittee. "We are being hassled out of existence for no reason at all," complains Walter Gilbert of Harvard. Kennedy's staff, on the other hand, says the bill establishes a minimum regulatory apparatus which is designed to wither away if scientifically unjustified.

Scientists' apprehensions about the bill have been amplified by Americans for Democratic Action, a liberal Democratic pressure group. On the initiative of a scientist member who cited the Kennedy bill, the ADA board recently adopted a resolution warning that Congress is "attempting to control specific activities through individual licensing and punitive action." Strict societal control of science, the resolution avers, has in the past preceded such excesses as Lysenkoism and "some of the inhuman practices in Nazi Germany."

The frustration behind these sentiments derives from fear that the impending legislation will set up a vast and cumbersome bureaucracy which will seriously impede research. Some scientists opposing the legislation consider it so restrictive as to constitute "prior restraint," a practice abhorred by civil libertarians in freedom-of-speech issues. Others fear that control of recombinant DNA research is only the tip of the iceberg, and that other techniques, such as cell fusion, will be next to be regulated. "It is clear that there are a whole bunch of regulators here who have discovered that we have been doing genetics for 30 years without permission. For a scientist that sounds hilarious, but they are dead serious," says an MIT biologist.

Resentment of the Senate bill on gene splicing has been compounded by a separate development, the emergence of a belief that the originally perceived health hazards of the research, which the present NIH regulations are designed to address, have been overestimated. Though much of the knowledge underlying this evaluation has been available for several years, it seems first to have been brought together this April by an individual member of the NIH committee which drafted the regulations. The review is in the form of a widely circulated letter from Roy Curtiss of the University of Alabama to the director of NIH. It lays out the evidence which persuaded Curtiss to change his position on the possible health hazards of the research from one of greater to lesser concern.



Senator Edward Kennedy

"I have gradually come to the realization that the introduction of foreign DNA sequences into EK1 and EK2 host-vectors offers no danger whatsoever to any human being," except in very special circumstances, Curtiss writes: "The arrival at this conclusion has been somewhat painful and with reluctance since it is contrary to my past 'feelings' about the biohazards of recombinant DNA research."

"The Curtiss paper has had a big impact because he started from the other side and is a very credible guy," observes Alexander Rich of MIT. One important impact of Curtiss's palinode has been on the NIH Recombinant DNA Committee. At meetings held in May and June the committee recommended reducing the stringency of its guidelines in several respects (human shotguns to be permitted in P3 physical containment instead of P4; all P4 experiments to be permitted with only an EK1 host-vector). According to an account of the June meeting in the *PMA Newsletter*, the

committee members "often mocked their own restrictions" with remarks such as " 'P4 is designed to prevent research,' 'P1 is a laboratory plus a bureaucrat,' and 'These high levels are political, not scientific.' "

The committee's recommended changes have yet to be approved by the NIH director; even if approved, it is not yet clear that they will be incorporated into legislation.

Another probable impact of Curtiss's letter was on the mood of delegates attending the Gordon Conference on Nucleic Acids in June this year. It was a letter from the members of the 1973 conference which first directed public attention to the possible hazards of gene splicing. But having heard an exposition from Alexander Rich of the pending legislation, 137 delegates signed a letter to Congress expressing worry that the regulatory machinery now being considered will be "so unwieldy and unpredictable as to inhibit severely the further development of this field of research." Much of the stimulus for the legislation seems to derive from exaggerations of the possible hazards, the letter adds (*Science*, 15 July, p. 208).

Another scientific group which has sought to persuade Congress is the Inter-Society Council for Biology and Medicine, a coalition of seven scientific societies. In a letter of 30 June to Congressman Paul G. Rogers, chairman of the House health subcommittee, the council emphasizes the "general acceptability" of the present House bill on recombinant DNA "as opposed to the current Senate version." The legislation produced by Rogers' committee, the letter says pointedly, "will permit free scientific inquiry while protecting the health of the public."

Scientific opponents of the Kennedy bill, and Kennedy's staff differ strongly on the interpretation of the bill's requirements. Essentially the bill establishes a presidentially appointed commission within the Department of Health, Education, and Welfare. The commission would license facilities to conduct gene splicing research, and would employ a team of inspectors to visit laboratories, examine records, and monitor compliance. In the event of infringements, facilities could have their licenses revoked, and researchers could be fined up to $10,000 a day per violation. The commission is to issue new regulations which are "no less stringent" than the present NIH guidelines. (The House bill essentially contains all the same features—licensing, inspectors, fines of $5000 a day, and new regulations—but with the major difference that enforcement is placed in the hands of local biohazard committees instead of a federal commission.)

Opponents of the Senate bill complain that it makes the process of getting an experiment approved an intolerable struggle through layers of red tape. According to a staff member who helped draw up the legislation, but who declines to be identified, the bill simply requires that a researcher's facility be licensed, and his project registered with the commission; the only review and approval is by his local biohazards committee.

Opponents say the Senate bill creates an unwieldy bureaucracy which will spend some $25 million to regulate a mere $3 million of research. The Senate staff member says that the bureaucracy created by the bill comprises the president of the commission, who would be its only full-time member, and 50 inspectors. According to the congressional budget office, the cost of the regulatory apparatus will be less than $4 million a year.

Opponents claim that the Senate health subcommittee desires to regulate other aspects of biological research, gene splicing being only a first step. The staff member states that there is no basis for this claim, and that Kennedy has no such intention.

Opponents predict that the damage caused to science by the legislation will be comparable to that done by Lysenkoism in the Soviet Union. The staff member says he heard similar predictions about the creation of the Commission for the Protection of Human Subjects in Behavioral and Biomedical Research; now that the commission is about to expire, he says, the same people are urging that it be continued.

The Senate bill on recombinant DNA has been approved in committee (although Senator Gaylord Nelson is thinking of writing a minority report) and is likely to be taken up by the full Senate shortly. In the House, the bill prepared by Rogers' subcommittee is to be considered by the committee on science and technology before going to the House floor.—NICHOLAS WADE

Engineer's Memo Stirs Doubts on Clinch River Breeder

President Carter issued a bold challenge to partisans of nuclear breeder reactors last April when, as part of his energy package, he urged that construction of the multi-billion dollar Clinch River Breeder Reactor (CRBR) be deferred "indefinitely," and that research into alternative types of reactors be upgraded. The President's principal concern about plutonium breeders such as the one planned for Clinch River is that the excess plutonium produced could be diverted to make bombs.

Carter's opposition to construction of the CRBR stirred up a fight in the Senate where, in late June, an attempt to kill the $150-million allocation for the breeder in the fiscal 1978 appropriations bill failed in committee. However, the full Senate subsequently voted 49 to 38 to keep the Clinch River project alive. Instead of granting Carter's request to defer construction indefinitely, the Senate accepted a compromise measure from Henry M. Jackson (D–Wash.) and Frank Church (D–Idaho) that delays construction for a year but provides $75 million in new funding to continue research and support the "base of professionals" who will be needed if Congress decides to fully endorse the project next year.

The House is expected to weigh in on the Clinch River issue within days.

The Clinch River breeder has been controversial from the start but in late June trench warfare on Capitol Hill over its fate escalated to new heights with the circulation of a stinging internal memorandum by Burns and Roe, Inc., the architect-engineering firm on the project. Written in 1973 but kept confidential until now, the 42-page document is devastatingly critical of CRBR's management and argues that safety concerns have