solve? Our government, at least in the past, has not been ready to make long-term decisions.

"Some of my colleagues feel that it is the scientist's job to do science, and society's job to cope with what he does. I disagree with this in principle. The scientist must keep the public informed and involved because nobody else will.

"It is entirely possible, as Chargaff said, that the future may curse us [for the consequences of the recombinant DNA technique]. Really only the interests and concerns of the scientific community were involved in formulating the guidelines."

Those who formulated the guidelines have shown a curious reluctance to come out and debate Sinsheimer at his own broad level of argument. The pursuit of knowledge is held even by nonscientists to be a distinguishing value of society†. Is that the answer to Sinsheimer's belief that the right of free inquiry should not be absolute in the case of recombinant DNA? If it is, nobody has rushed forward with it in any of the public documents intended to justify the NIH guidelines.

Sinsheimer believes that one step leads inevitably to another, that the recombinant DNA technique is the beginning of the genetic engineering of bacteria, of plants and domestic animals, and ultimately of man. "Do we want to assume the responsibility for life on this planet . . .? Shall we take into our own hands our own future evolution?" Sinsheimer has asked. If any of his opponents had heard the question, they might perhaps have answered to the effect that since man has now insulated himself from Darwinian pressures, some other means of genetic improvement must be found to assure his continued progress as a species. But Sinsheimer, who seems to have a virtual monopoly of long-range thought about the issue, has also provided an answer to the question. He says, in essence, that we aren't clever enough to know, so shouldn't yet try.

The recombinant DNA technique will clearly bring to birth a technology so potent that even its slightest deviations from the intended path may cause grievous perturbations in society at large. Historians half a century from now will no more blame the architects of the guidelines for failing to cope with every possible contingency than do their contemporaries blame Henry Ford for every highway casualty. Yet they may take a certain interest in the quality of the arguments being relied on for riding roughshod over the reservations articulated by Sinsheimer. Would they be very favorably impressed with what is on the record so far?—NICHOLAS WADE

†For example, "America's distinctive values are, most conspicuously, individual freedom, civil and religious liberty, the pursuit of truth," states former Secretary of Defense James R. Schlesinger in the current issue of *Foreign Policy*.

NSF: New Program Criticized as "Appalling" Subsidy to Activists

The biggest fight over the National Science Foundation budget this year did not involve allegedly "un-American" science curricula or silly-sounding research projects or any of the other headline-making topics that have titillated congressmen in recent years. Rather, it focused on a modest new program known as "Science for Citizens" which seeks to improve public understanding of and involvement in policy issues. That program, in the eyes of both proponents and opponents, has the potential for substantially increasing the technical resources of public interest groups that do battle with the government and industry.

The dispute over this relatively minor part of the NSF budget became the chief obstacle to attaining agreement between the Senate and the House on legislation authorizing NSF programs for fiscal year 1977. Conferees from the two houses wrangled for 3 months over the legislation, finally reaching agreement in the waning days of the congressional session.

One House conferee—Representative Mike McCormack (D–Wash.)—was so opposed to the program that he refused to sign the conference committee report recommending authorization for the NSF budget. McCormack told *Science* he considers it "appalling" that the federal government, through NSF, may end up subsidizing groups that are intervening to block programs that the government has already authorized. "The intervening groups are rubbing their hands and drooling over this," he complained.

The driving force behind the Science for Citizens effort is Senator Edward M. Kennedy (D–Mass.), who has been waging battle on many fronts to increase public participation in technical decision-making and to provide government funding for the impoverished citizen groups that seek to influence public policy. From his seat as chairman of the Senate subcommittee on NSF, Kennedy sought to launch the program last year but was beaten back and had to settle for a planning study by NSF.

That study, which was based in part on testimony gathered at seven public hearings in different regions of the country, was submitted to Congress in February. It set forth nine options for conducting the program but tried to keep NSF out of politically sensitive areas by stating that "no direct financial assistance is envisioned to public interest groups." The report argued that NSF is not an appropriate organization to determine which public interest viewpoints deserve funding. It also claimed that provision of such funding "could potentially place NSF in an advocacy position beyond its mandate and inappropriate to its mission." The Foundation clearly had modest plans for the program. Its budget request sought only $300,000 to continue development of the program and to conduct trial runs of several of the options.

The go-slow approach seemed just fine to the House Committee on Science and Technology, which endorsed both the $300,000 support level and the notion that "NSF should remain as far away as possible from direct assistance to citizens' groups." The House committee urged NSF to "concentrate on provision of educational and informational materials, and not become involved with citizen litigation or direct intervention in administrative proceedings." Its chief concern was that NSF might get embroiled in political disputes that could jeopardize support for its other programs.

But Kennedy and his cohorts in the Senate had more ambitious plans. They recommended funding of $3 million and suggested that some of it go directly to citizen groups to help them acquire "necessary technical expertise." The Senate

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eventually approved Kennedy's vision of the program while the House approved the more modest plan, setting the stage for conflict when representatives from each body met in conference committee to try to iron out differences between the two versions of the legislation.

After months of haggling, the conferees agreed on a compromise program which was considerably scaled down and hedged in from what Kennedy had envisaged. The conferees recommended that $1.2 million be authorized to support the program. In deference to the concerns of the House, they set certain restrictions on how the money can be disbursed. All grants and contracts must be approved by the National Science Board, which is often skittish about getting involved in touchy political issues. No funds can be given to registered lobbying groups. And funds that are given directly to other public groups can only be used to support forums, conferences, and workshops. Nevertheless, depending on how NSF interprets its mandate, the legislation could still provide significant aid to public interest groups.

The lobbying restriction will not affect most citizen groups, since those that lobby generally set up separate units to do so. But funding of workshops could greatly assist poverty-stricken groups that have difficulty assembling scientific advisers to work jointly on a problem. And another provision of the law—authorizing NSF to support the participation of experienced scientists and students in helping the public understand issues involving science and public policy—could give some groups a new cadre of talent. The Kennedy forces view that last provision as authorizing a fellowship and internship program that would support scientists and students while they work on public policy issues. That work could be carried out in conjunction with public interest groups, state and local governments, or other appropriate bodies, thus providing an indirect form of assistance to the groups involved.

One leading public interest scientist—James B. Sullivan, codirector of the Center for Science in the Public Interest—called the legislation "a step in the right direction" toward enabling citizen groups to redress the imbalance between their technical resources and those of industry and government.

But Representative McCormack expressed fears that the new program might prove a windfall for some groups that oppose programs he favors. McCor-

mack, who is an ardent advocate of nuclear power, suggested that the Union of Concerned Scientists or the Natural Resources Defense Council, two groups critical of nuclear power, might stage a conference on "why nuclear power is so dangerous to the country" or "why crime rates are increasing around nuclear reactors." He also suggested that some groups might try to subvert the program by using funds intended to support forums as a device for paying off scientists who assist them in other activities. As an example, he suggested that a group might pay $1000 to a scientist for a half-hour speech at a forum, then gratefully accept the "free" service offered by that scientist in preparing a case against nuclear power. McCormack said he would use his position as a member of the House committee with legislative jurisdiction over NSF to "encourage" the Foundation to "screen the applicants so the money goes where Congress intended." By that, he means to "a public education program" rather than to support of groups that intervene in regulatory actions against the government.

Officials at NSF are somewhat baffled as to what mandate they have been given. Alexander J. Morin, director of NSF's Office of Science and Society, says he would "personally like to find a way to enable scientists to contribute to the resolution of public policy issues." But he adds: "I'm not certain at this point how to do that. I don't know what the legislative mandate allows me to do." Morin is not certain, for example, if the program would award fellowship support to a scientist who, in turn, would intervene in a regulatory case. Thus he will shortly be making the rounds of both House and Senate to get a reading from all parties as to how they interpret the legislation. The Senate will argue for a broad, aggressive program. The House will urge caution.

At the same time, budget specialists from NSF will try to divine how much money Congress really wants spent on the program. Although the authorization legislation earmarked $1.2 million for the program, the appropriations bill did not specify an amount; it simply put the program in with other science education activities under a lump sum. On a pro rata basis, it appears that Science for Citizens would receive maximum funding for fiscal year 1977 of $1 million. How well it does in future years will depend in part on the results of a "comprehensive analysis and assessment" of the program which NSF will conduct at the direction of Congress.

—PHILIP M. BOFFEY

BOOKS RECEIVED

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Handbook of Industrial Toxicology. E. R. Plunkett. Chemical Publishing Co., New York, ed. 2, 1976. iv, 552 pp. $27.50.

Handbook of Solid-State Troubleshooting. Hershal Gardner. Reston (Prentice-Hall), Reston, Va., 1976. xii, 318 pp., illus. $15.95.

Herbal. Joseph Wood Krutch. Godine, Boston, 1976. 256 pp., illus. Cloth, $27.50; paper, $10. Reprint of the 1965 edition.

History of the Coniferous Forests, California and Nevada. Daniel I. Axelrod. University of California Press, Berkeley, 1976. vi, 62 pp., illus. Paper, $5. University of California Publications in Botany, vol. 70.

Infrared. The New Astronomy. David A. Allen. Halsted (Wiley), New York, 1976. 228 pp., illus. $12.

Intermediate Mathematics of Electromagnetics. Donald G. Stinson. Prentice-Hall, Englewood Cliffs, N.J., 1976. xii, 290 pp. $18.95. Prentice-Hall Electrical Engineering Series.

Intermediate Politometrics. Gordon Hilton. Columbia University Press, New York, 1976. x, 282 pp., illus. $15.

International Environmental Law. Bo Johnson. LiberFörlag, Stockholm, 1976. 226 pp. Paper, Sw. Cr. 40.80.

Introduction to Computers. Alton R. Kindred. Prentice-Hall, Englewood Cliffs, N.J., 1976. vi, 538 pp., illus. $14.95.

An Introduction to Hydrodynamics and Water Waves. Bernard Le Méhauté. Springer-