magna cum laude from the Harvard Law School in 1954. He was a Fulbright scholar and is author of *The First Three Years of the Schuman Plan* (Princeton Univ. Press, Princeton, N.J., 1955), and a number of other books and scholarly articles. He is married to the former Sissela Ann Myrdal, daughter of the Swedish sociologist Gunnar Myrdal and a Harvard Ph.D. herself.

Bok's Stanford degree makes him the first Harvard president since the 17th century who did not graduate from Harvard College. Apparently the corporation was willing to break a centuries-old tradition in its efforts to find a man who will keep the university together, and most of the Harvard community feels that Bok will have to break more traditions in order to do the job.

—THOMAS P. SOUTHWICK

*The author, a* Science *news intern last summer, is an undergraduate at Harvard and executive editor of the* Crimson.

# Water Pollution: Conservationists Criticize New Permit Program

*We read the 1899* [Refuse] *Act charitably in light of the purpose to be served. The philosophy of the statement of Mr. Justice Holmes . . . that "a river is more than an amenity, it is a treasure," forbids a narrow, cramped reading . . .*—U.S. Supreme Court, U.S. *v.* Republic Steel, 1960

The Nixon Administration announced with some fanfare on 23 December the establishment of a program requiring federal permits of all industries discharging wastes into the nation's waterways. The President stated at the time that the new program would "make maximum use of all existing provisions of law relating to water quality" and would "provide a major strengthening of our efforts to clean up the nation's water." Russell E. Train, chairman of the Council on Environmental Quality, called the new program "the single most important step to improve water quality that this country has yet taken."

The Administration's program is based on an 1899 law, known as the Refuse Act, prohibiting the discharge of "any refuse matter of any kind or description whatever" into any waters of the United States, except under permit from the Army Corps of Engineers. Until now the requirements for an industry to obtain a permit had been unspecified, and few permits had been issued. Under the new program, all industries discharging materials into public waterways must, in applying for a permit, submit a detailed application specifying the exact nature and quantity of their discharges. Thus Administration officials hope to obtain the information necessary to insure that all industrial operations conform to water quality standards.

The nation's waters, however, may remain polluted for some time to come. Environmentalists and some members of Congress have attacked the program as nothing more than an attempt to grant industry a license to pollute. Specifically, the environmentalists fear that the new program will severely limit the usefulness of the present antipollution laws, especially the Fish and Wildlife Co-ordination Act, and that it will establish a moratorium period preventing litigation against severe polluters. The environmentalists' principal objection is that the Administration's program will leave determination of water quality standards to state regulatory boards, many of which are notoriously lax and dominated by industry.

The basic question at issue is whether the Administration had any choice but to combine the provisions of the Refuse Act with those of new antipollution legislation. Administration officials insist that it was necessary to combine the laws in the new program. Administration critics argue just as vehemently that there is no such requirement.

Now regarded as the strongest piece of federal antipollution legislation even though it specifically excludes municipal wastes, the Refuse Act had been, until recently, narrowly interpreted by the Corps to apply only to discharges that impeded navigation. This policy of the Corps was not an effort to condone pollution, but rather was part of the general American notion that rivers and streams were natural places to put garbage. As the ecological consciousness grew in the United States, the Refuse Act became a vehicle for several suits against polluting industries; and in several cases in the last decade the courts ruled that the act prohibits accidental as well as continuous discharges and includes such diverse pollutants as oil and thermal discharges. But the Corps still did not initiate any significant crackdown on polluters.

In the early part of 1970, Representative Henry S. Reuss (D–Wis.), chairman of the House Subcommittee on Conservation and Natural Resources, took up the Refuse Act as his personal cause. Seizing on a safe political issue, Reuss held hearings* to establish the potential usefulness of the Refuse Act in curbing water pollution, and he publicly criticized the government for failing to invoke it. Reuss also publicized a portion of the act which provides that one half of any fine levied against a polluter be paid to the "person or persons giving information which leads to conviction" and, at the same time, suggested that under a little-used legal device dating back to English common law, citizens themselves could initiate proceedings against polluting industries and thus recover one half of the fine. To this end, Reuss's office distributed hundreds of "do-it-yourself" information kits† describing the potentials for citizens' actions against polluters. Few actual cases have been brought to court, however, possibly because buried in Reuss' information kit is a warning that if a citizen loses his suit he will be liable for his lawyer's fees and all court costs.

The government, however, is not limited by such considerations. After some prodding by Reuss, the Corps of

* Report of the hearings entitled "Our Waters and Wetlands: How the Corps of Engineers Can Help Prevent Their Destruction and Pollution," twenty-first report by the Committee on Government Operations. Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402; 15 cents.

† "*Qui Tam* Actions and the 1899 Refuse Act: Citizen Lawsuits Against Polluters of the Nation's Waterways," report of the Conservation and Natural Resources Subcommittee of the Committee on Government Operations. Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402; 20 cents.

Engineers announced on 30 July 1970 that it would soon institute a policy of full enforcement of the 1899 Act—based on the Corps' determination of water quality standards—that would require permits from all industrial polluters. Other segments of the government, however, were not so enthusiastic about enforcement of the Refuse Act. The Justice Department, responsible for prosecuting violators of the Refuse Act (the Corps of Engineers is empowered only to issue permits), issued on 15 June 1970 a set of guidelines for litigation under the Refuse Act. The guidelines, sent to all U.S. attorneys, offered a weak interpretation of the Act, specifically excluding action against manufacturers releasing pollution "of a continuing nature," resulting from the plant's normal operations and action against anyone discharging pollution under license from any state or local government. In defending the guidelines, Justice Department officials claimed that any stricter enforcement of the Refuse Act would interfere with certain provisions of the Federal Water Pollution Control Act.‡ The provisions of the Water Pollution Control Act in question require that any applicant for any type of federal permit for an activity that might discharge wastes into public waters must first obtain certification from the state where the discharge is to made that such a discharge will be acceptable.

### Conflict Leads to Compromise

Thus a conflict existed in the federal government between the Army Corps of Engineers who wanted a comprehensive permit system under the Refuse Act and the Justice Department who wanted essentially to ignore the Refuse Act and to rely on more recent legislation to curb pollution—legislation which essentially relies on the states. The Administration's recently announced federal permit system resolved this conflict by incorporating provisions of both the Refuse Act and the more recent legislation in the complicated set of regulations spelling out the specific procedures of the new permit program. These regulations, provisionally announced for a 45-day period of discussion, form the basis of the criticisms directed at the program.

‡ Soon after the issuance of the guidelines the Justice Department was forced to make exception to its policy because of mounting public concern over mercury pollution. In order to curtail the activities of several industries discharging mercury, Justice invoked the 1899 Refuse Act since it was the only law available to halt the mercury pollution.

Under the regulations, the Corps will receive permit applications, specifying the precise nature and amounts of the materials being discharged, from some 40,000 industries believed to be discharging materials into public waters. The regulations, however, deny the Corps any authority to consider water quality standards in accepting or denying the permit applications. Instead, the Corps will first forward the applications to the appropriate state water quality board for certification and then to the new federal Environmental Protection Agency for final certification. But EPA's certification will be, for the most part, a mere formality. Administrator of EPA William Ruckelshaus said, in an interview with *Science*, that his agency, except in a few specific instances, does not have the authority to impose water quality standards more stringent than those of the individual states.

Congressman Reuss disagrees. Reuss told *Science* that it is only the new regulations, which he termed "poorly drafted and totally ineffective," that restrict the federal government from carrying out a truly comprehensive program to control water pollution. Reuss, along with lawyers from several conservation groups, believes that there was no need to combine the provisions of the 1899 Act with the more recent legislation. Since the Refuse Act specifies no limitations on the Corp's authority to determine what constitutes "proper" amounts of discharges, Reuss and the conservation lawyers advocate a permit program based solely on the 1899 Act. As an example of an acceptable program, Reuss points to the permit program, newly established by the Corps of Engineers, for outfall sewers from buildings constructed next to waterways. Under that program, the Corps will allow the discharge only if it is shown, after consultation with all of the involved parties and with concerned governmental agencies, that allowing the discharge would be in the public interest. There is no "public interest consideration" in the regulations for the new permit program under the 1899 Act.

One of the political factors probably considered by the Administration in establishing the new program is the strong resistance that the individual states would offer strict federal standards. Hugh Yantis, executive director of the Texas Water Quality Board, regarded as one of the best state boards, said in a telephone interview that his state was working through a systematic program involving cooperation with industry and that the imposition of strict federal standards at this time would be a disaster. Yantis said that for Texas the new federal permit program would have little, if any, effect. But he added that, for some states where there is virtually no enforcement of water quality standards, the new program might bring an improvement of water quality.

In addition to the new program's leaving considerations of water quality to the states, environmentalists are concerned about its relationship to the Fish and Wildlife Co-ordination Act. That act specifies that any federal program that might threaten fish or wildlife must be approved by the Fish and Wildlife Bureau of the Department of the Interior. Under the new Refuse Act regulations, fish and wildlife considerations are limited to situations where the stream is physically altered. Thus massive poisoning of the fish in a river would not be sufficient cause for the Fish and Wildlife Bureau to comment on a particular industry's application for discharging refuse—the Bureau must wait until the pollution literally buries the fish.

### Enforcement Delays Feared

A third item of controversy about the new permit program is the question of enforcement. The Administration is requiring applications for permits from all industrial dischargers by 1 July 1971, but both the Corps and the Environmental Protection Agency lack sufficient staff to rapidly process 40,000 complicated applications. While EPA Administrator Ruckelshaus insists that the new program will not limit prosecutions of polluters, he admits that an industry will not be subject to prosecution until its application for a permit is denied. Thus, if there are long delays in processing applications, some industries may become immune from prosecution for several years, even though they continue to pollute.

The regulation of industries, once they have obtained a permit, presents another enforcement problem because the industries themselves provide the data on the nature and quantity of their water discharges. Under questioning from newsmen at the press conference announcing the new permit program, Ruckelshaus admitted that his agency lacked the staff to check any but a few of the industries receiving permits. But the regulations require that the

principal executive officer of a corporation must sign the application, and Ruckelshaus later told *Science* that he was amazed at the emphasis placed on potential "cheaters" under the program, since "few businessmen, no matter how black their hearts, will be willing to sign a false statement that could land them in jail for 5 years."

Ruckelshaus also said that the new permit program, in spite of the criticisms levied against it, will, for the first time, give the government an accurate assessment of the amount of wastes being dumped into the nation's waterways. Thus, he said, the emphasis on pollution control will shift to specific water quality standards rather than to vague notions about too much pollution. He added that "if conservation groups, or anyone else, object to our water quality standards they should tell us—by lawsuit if it makes them happy—and we'll try to improve them."

Ruckelshaus noted that some of the criticism he had heard of the Administration's new program was actually contradictory. And this is hardly surprising since some of the conservationists' motives for protesting the program are not entirely based on the program's specifics. As one conservation lawyer put it: "The program itself isn't all that bad. It's just that we don't trust the Nixon Administration to regulate industry."

—ROBERT J. BAZELL

# R&D Conversion: Former NASA Lab Now Working on Transportation

*Cambridge, Mass.* At a time when both employment and morale in the science and engineering professions are dropping, the Transportation Systems Center (TSC) in Cambridge stands out as an example of where U.S. technological manpower *could* go from here. Formerly a facility of the National Aeronautics and Space Administration (NASA), TSC is now putting 450 highly trained employees, mainly electronic engineers, to work on the more mundane problems of transportation. And it is facing the resulting problems—and benefits—of "conversion."

The Center was conceived in 1962 as the Electronics Research Center (ERC) for NASA and was to be the space agency's most forward-looking research arm. Plans called for 14 buildings and 2100 employees. The location was to be near the Massachusetts Institute of Technology, a decision alleged to be a sop to Edward M. Kennedy's 1962 campaign pledge that "he can do more for Massachusetts." But logically, the Center was planned to benefit from and boost one of the country's largest clusters of electronics industries around Boston's ring road, route 128. The city of Cambridge drew up renewal plans for the rather rundown industrial neighborhood around the site. Ground was broken for ERC construction in November 1966, and by December 1969 six buildings were completed and 850 people hired, including 100 Ph.D.'s. Even then the new Center was barely in operation; only one of the new buildings, an optics research lab, was occupied, and the remaining employees were working in rented space nearby.

Thus, it was a shock when NASA Administrator Thomas O. Paine came to Cambridge on 29 December 1969 and announced that, owing to budget cutbacks, the newborn center would close on 30 June. "We are simply faced with the hard fact that NASA cannot afford to continue to invest broadly in electronics research as we have in the past," he said. The announcement launched a period of frantic consultations by ERC brass with industry and government to find a new sponsor, public hand-wringing by state politicians embarrassed by Washington's sudden reversal, and loud agonizing by Cambridge officials fearful for their investment in urban redevelopment. Finally, on 25 March 1970, John A. Volpe, Secretary of the Department of Transportation (DOT) and former governor of Massachusetts, announced that DOT would take over the facility on 1 July. He was quoted then as saying that "a substantial majority" of the employees would stay on at the center.

But DOT's 1971 budget had already been "put to bed"—and, aside from NASA pledges of some continuing support, there was no additional money to pay for retaining the 850 employees. The Volpe announcement launched a second round of consultations—this time between ERC staff and the agencies within DOT, to see how much work could be lifted out of existing projects and transferred to the Center. The result was a potpourri of 56 projects, totalling $22.5 million, including $6 million in continued NASA funds and $6.9 million in outside contracts. By 30 June, there were 611 employees left at ERC. On 1 July, only 425 of these were formally hired by DOT. Total attrition over the whole 6-month period was one-half, or 406 ERC employees. The most significant loss was the scientists—mainly physicists. Work for electrical engineers willing to make the switch was relatively easy to find within DOT; basic research, on the other hand, was not. In effect, although drastically reduced, ERC continued intact, but without its "pure" research wing. Some of the scientists who lost their jobs are still unemployed.

DOT's assumption of the Center implied a commitment to research and development—independent of any of the agencies within the department. Previously, the department had only four so-called "research" facilities: the High Speed Ground Test Facility in Pueblo, Colorado, run by the Federal Aviation Administration (FAA); the Aeronautical Center in Oklahoma City, Oklahoma, also run by the FAA; the National Aviation Facilities Experimental Center (NAFEC) in Atlantic City, New Jersey, run by the FAA; and the Fairbanks Research Station in McLean, Virginia, run by the Federal Highways Administration. But the primary purpose of these facilities is to test equipment built by industry for road, rail, or aircraft use. In Atlantic City, for example, NAFEC tests airplane equipment against FAA regulations; the Oklahoma City center trains air traffic controllers. Neither is equipped to do advanced technical work, research on relationships among alternative types of transport, or basic, long-range planning