is now working in the Washington headquarters said, "It gives an insight into how to deal with someone who doesn't have a damn thing. Will you learn another language? Will you adopt their way of life? Will you step out of your professional role, your cultural role, to be effective?"

Many of the former PCP's have settled into conventional professional roles. As one of the conference organizers observed, "I was surprised at what a lot of conservative guys there were. You know, they say 'the Peace Corps was a great experience but now I want to do my own thing.' That really means country club, Cadillac, and kids in college."

As a group, however, the PCP's give the impression of openness to change. One PCP now working in a public health service program in Alaska said it was worth coming to the conference "just to find that there was a nucleus of people working for change." Among their colleagues, the PCP's seem to feel that they are a minority. One man at a group session asked why a representative of the American Medical Association wasn't on the program. The assumption was that organized medicine was for the status quo. And the PCP's seem representative of a group which, whatever their good intentions, can still be described as disorganized medicine.

—JOHN WALSH

Nerve Gas Disposal: How the AEC Refused to Take Army off the Hook

Largely obscured in the controversy over the deep-sea dumping of nerve gas this past summer was an extraordinary episode involving the U.S. Army and the Atomic Energy Commission. At issue was a proposal by which the AEC would relieve the Army of its dangerous stock of gas by disposing of it in an underground nuclear blast—a method thought to promise safer and more predictable results than disposal at sea.

The AEC, which frequently must fend off critics of its underground test program, apparently was horrified at the idea of taking over the Army's nerve gas problem. The Army, partly for good bureaucratic reasons of its own, chose not to press the issue. Some members of Congress think it is too bad that, with respect to this controversy, the fledgling White House Council on Environmental Quality was established too late to have a chance to knock heads in the public interest.

The man who has done the most to smoke out the details of the Army-AEC incident is Representative Alton Lennon of North Carolina, chairman of the House Subcommittee on Oceanography and a member of the Subcommittee on Fisheries and Wildlife Conservation. On 12 August, while this latter subcommittee was having a friendly session with the new White House council, which had just issued its first environmental quality report, Lennon commented sarcastically: "I suppose the appropriate way to commemorate and celebrate this first report is to dump 416 coffins containing nerve gas and active rocket propellant and fuses off our coast."

Lennon had special reason to be upset and aroused. First, the Military Ocean Terminal at Sunny Point, North Carolina, is in his congressional district—and this was where the vaults containing the nerve gas weapons had been put aboard the hulk of the *Le Baron Russell Briggs,* the surplus Liberty ship which was to be towed to a point about 250 miles off the continental shelf and scuttled. Second, as chairman of the House Subcommittee on Oceanography, his long-standing interest had been in promoting greater use of marine resources, a purpose he felt was poorly served by using the ocean as a disposal ground for lethal chemicals.

Lennon's oceanography subcommittee already had held 4 days of hearings on the dumping of the nerve gas. During these hearings Lennon and other congressmen from coastal states had grilled Army and AEC witnesses intensively and sometimes had not bothered to suppress their outrage. At this point, however, it will be useful to review briefly the history of Operation CHASE—the acronym for "Cut Holes and Sink 'Em"—that finally ended when, on the afternoon of 18 August, the *Le Baron* hit bottom at a depth of 16,000 feet, with just what consequences for its cargo nobody yet knows.

In 1967 and 1968 the Army, acting in secrecy, had dumped more than 21,000 M-55 rockets, each armed with an explosive charge and 10.8 pounds of GB liquid nerve gas, off the New Jersey coast. Fearing that the rockets were defective and that the gas might begin leaking out, the Army had first imbedded them in concrete inside steel vaults or "coffins."

In the spring of 1969 the Army, again acting on the quiet, was planning to complete its disposal of chemical weapons which had become either obsolete or unsafe by dumping another 26,000 tons of them. Included in this batch were nearly 12,500 M-55 nerve gas rockets encased in concrete and steel in precisely the same manner as the rockets disposed of earlier. This time, however, word got out about these plans. Suddenly the Army found itself under heavy criticism from members of Congress worried about the hazards involved in shipping the munitions across country from various Army depots to the ocean terminal as well as about the environmental implications of dumping them at sea.

The Pentagon was having second thoughts about Operation CHASE and, in May of 1969, the director of Defense Research and Engineering, John S. Foster, Jr., asked the National Academy of Sciences about how best to dispose of the weapons. Several weeks later, an ad hoc committee of the academy chaired by George B. Kistiakowsky of Harvard concluded that most of the munitions could be detoxified on land. But the nerve gas rockets, irretrievably committed to their vaults, posed a baffling problem. The committee could only recommend that a panel of technically qualified experts be asked to determine whether there was a feasible alternative to dumping the vaults at sea.

Subsequently, a committee named by the Army, with Paul M. Gross of Duke University as chairman, reported that there was such an alternative—the destruction of the vaults by an underground nuclear explosion. "Disposal by

this means could be incorporated in an ongoing or scheduled test program," the Gross committee said. "The results would be completely predictable with all the agent and the explosive destroyed. No additional hazard will result from the inclusion of this material in the underground nuclear shot."

If this alternative—which it "vigorously recommended"—was not to be adopted, the committee said the vaults should be dumped at sea at a depth of 15,000 feet, or more than twice the depth of the previous disposals. The committee emphasized that in no event should the vaults be disposed of later than 1 August 1970. Beyond that time, the panel indicated, continuing deterioration of the rockets might result in an explosion that would expose populations downwind to the GB agent, which kills within minutes.

In late September the Army received, as it had requested, a study by the AEC's Nevada Operations Office and the Lawrence Radiation Laboratory of the feasibility of a project—dubbed "Operation HARPIN"—to dispose of the vaults by a nuclear blast. The HARPIN study, which the AEC commissioners had not at that point reviewed, concluded that destruction of the vaults could be assured by the explosion of a nuclear device of about 100-kiloton yield.

Ingenious Plan

An ingenious plan for emplacing the vaults underground was proposed. The spherical chamber to be excavated at the bottom of the shot hole—6 feet in diameter and 1600 feet deep—would be 56 feet high in order to allow the 6.4-ton vaults to be emplaced in five successive layers without its ever being necessary to lift them once they were underground. One by one, all 416 of the 7½-foot-long vaults were to be upended and lowered lengthwise down the hole. Each vault would have had heavy-duty casters fastened to the lower end so that once it reached the chamber a small electric truck could be used to maneuver it into place. Once the first layer of vaults was emplaced, thick plywood was to be laid on top and a second layer of vaults emplaced upon it; the third, fourth, and fifth layers of vaults were to be emplaced in similar fashion.

The study arrived at these further conclusions:

- If an already completed hole then available on Yucca Flats of the Nevada Test Site were used, HARPIN could be carried out at a cost of about $3.5 million and completed in about 41 weeks—well within the deadline of 1 August 1970. Certain alternative sites for HARPIN were discussed, but use of any of these would have meant delaying the shot beyond the deadline.
- But, if conducted on Yucca Flats, HARPIN would cause "unacceptable" interference with other Nevada Test Site activities. According to the study, a weapons test could not be effectively combined with HARPIN.
- Finally, "the public relations" aspect of HARPIN was deemed "profound" and "the effect upon public criticism of underground nuclear testing must be evaluated." If HARPIN should be a "technical and 'political' success," the study warned, "the possibility of other unusual projects being proposed for the Nevada Test Site must be faced" and the long-term impact on weapons-testing considered.

The AEC Refuses

After the HARPIN study was reviewed at a meeting of the AEC on 7 October, the Army was notified that the agency would not carry out the project unless directed to do so by the White House. This message was transmitted at the staff level by telephone and no record is available as to precisely what was said. Army and AEC witnesses disagreed before the Lennon subcommittee as to just how emphatically the AEC had shut the door on HARPIN. General W. R. Stone, Jr., the Army's man in charge of disposing of the nerve gas, said that the AEC had indicated it "wanted no part of the operation." But AEC Commissioner Theos J. Thompson said the Army had been given an "option"—that, if HARPIN was really felt to be necessary, the Army could have come back and said so.

Yet the Army, as all now seem to agree, had blundered badly by encasing the nerve gas rockets in steel and concrete. For it now to ask the White House to make the AEC rescue it from its predicament would have been a delicate and embarrassing undertaking. General Stone's explanation, however, of the Army's unwillingness to appeal the AEC's decision was that the Army staff had accepted the view that HARPIN would cause unacceptable interference with nuclear test programs.

Here, bear in mind that the National Environmental Policy Act of 1969 (NEPA) was still before Congress and would not be passed until late December. The Council on Environmental Quality (CEQ), to be set up under NEPA, would supervise the compliance of federal agencies with the Act's requirement for an "environmental impact statement" in all cases where a proposed action might have a significant environmental effect.

Such statements would evaluate the likely environmental effects of the action and discuss possible alternative plans by which harmful effects might be avoided. Further, the statement would be circulated among other agencies having relevant jurisdiction or expertise, then submitted along with the comments of these agencies to the CEQ. In cases where agencies refused to abandon potentially damaging activities, or refused to follow appropriate alternatives, the council would have the option of asking the President to intervene.

This is not to say that had the council existed last October it would *necessarily* have taken the view that the nerve gas rockets should have been disposed of by a nuclear explosion. As AEC members have pointed out, the handling of the vaults in HARPIN could have involved some exquisite dangers—although one must add that this operation would have been carried out in the wastelands of Nevada, whereas the loading of the vaults aboard the hulk was done not far from two North Carolina coastal towns. The point is that only the Army and the AEC, neither of which in the circumstances could take an objective view of the problem, considered HARPIN while time still remained to pursue this alternative. In fact, the CEQ, which has been functioning since March, never saw the HARPIN study until 4 August, a few days beyond the deadline for disposal of the vaults. "If time were not a factor, I would want to reexamine this whole question," Russell E. Train, the council's chairman, told the Lennon subcommittee.

Quick Disposal Urged

This past spring the Gross committee again reviewed the problem of disposing of the vaults, and, in a letter to the Army, Gross warned that the rockets were becoming unstable and said, "I cannot urge you strongly enough to take immediate action to dispose of these munitions." Accordingly, the Army again prepared to carry out Operation CHASE.

The impact statement required under the Environmental Policy Act was submitted to the CEQ in July. Under the

discussion of alternatives, the only allusion to HARPIN was the observation that the AEC had advised "that nuclear destruction is unsatisfactory." However, the Army had in fact asked the AEC for permission to include a copy of the HARPIN study in the impact statement. The Army had been informed that, if inclusion of the study was "mandatory," the AEC would sanction the use of the HARPIN document in a new version—one from which mention of the public relations aspects of HARPIN had been deleted. The AEC had asked that its strong opposition to HARPIN be emphasized and that the earlier study document be destroyed and that the new one be given as "little distribution as possible."

The Army's impact statement minimized the possibility of major environmental damage resulting from Operation CHASE. However, field studies of the earlier disposal of nerve gas had been extremely limited, although laboratory studies of questions such as the hydrolysis rate of the GB agent in salt water had been extensive. (A monitoring program will soon be undertaken at the site of the August dumping; no contamination was detected in water samples collected shortly after the hulk went down.)

The impact statement indicated that, to assume the worst possible case, the GB agent would contaminate 1 cubic mile of water above the sea floor, and this only briefly. However, the CEQ, in a memorandum to the Army prepared by Gordon J. MacDonald, a former member of the President's Science Advisory Committee, said that the impact statement left a number of questions unanswered and that no firm predictions about the effects of the dumping were in order.

For instance, while the Army had assumed that there is little marine life at the 16,000-foot depth and no fish of commercial value, the council said that present knowledge of sea life at that depth is quite incomplete. It then observed:

> It is known that carnivorous fishes are found at that depth. Most of the deep water fishes have eggs which rise to or near the surface. Eggs and larvae of other deep sea organisms come to or near the surface. It is believed that many organisms may make seasonal migrations from shallow to deep waters, and from coastal to deep waters. Many commercial fishes, for example flounder, which occur in shallow waters off the southeastern coast of the U.S. migrate into deeper waters in winter. The exact depth limits of some of these movements are not known. But the point is that there is a possibility that fishes, directly used by man, might pass through the contaminated zone, or might consume other organisms which have come from or passed through that zone. And it should be remembered that there are commercial surface fisheries in the general area [250 miles east of Cape Canaveral] of the dumping site.

Last week, Representative Emilio Q. Daddario (D–Conn.), chairman of the House Subcommittee on Science, Research, and Development, introduced legislation to give the Council on Environmental Quality authority to approve or reject any plan for disposal of military material in the oceans or navigable waters of the United States. Since the President—to whom the council is answerable—already has that authority, this legislation may not be needed. But the byplay between the Army and the AEC prior to Operation CHASE clearly suggests that federal agencies involved in controversial matters of this kind need a big brother.

—LUTHER J. CARTER

APPOINTMENTS

Ray J. Weymann, professor of astronomy, University of Arizona, to head, astronomy department, and director of Steward Observatory. . . . **Leonard D. Policoff**, chairman, physical medicine and rehabilitation department, Temple University Health Science Center, and director of physical medicine, Albert Einstein Medical Center, has been named chairman, physical medicine and rehabilitation department, Hahnemann Medical College and Hospital of Philadelphia. . . . At Northwestern University Medical School, Chicago, **Leslie T. Webster, Jr.**, associate professor of pharmacology and assistant professor of medicine, Case Western Reserve University, to chairman, pharmacology department; and **William Bondareff**, acting chairman, biostructure department, elevated to chairman of the department. . . . **Sydney R. Parker**, professor of electrical engineering, University of Houston, to chairman, electrical engineering department, Naval Postgraduate School. . . . **Robert A. Ellis**, former professor of sociology, University of Oregon, to chairman, sociology department, University of Maryland. . . . **M. A. Rouf**, professor of microbiology, Wisconsin State University, Oshkosh, to chairman, biology department at the university. . . . At Princeton University, **Sheldon Judson**, Knox Taylor Professor of geography, to chairman, geological and geophysical sciences department; and **Marvin L. Goldberger**, Eugene Higgins Professor of theoretical physics, to chairman, physics department. . . . **John W. Winchester**, professor of oceanography, meteorology and oceanography department, University of Michigan, Ann Arbor, to chairman, oceanography department, Florida State University. . . . **Campbell M. Gilmour**, director, Center for Environmental Biology, University of Utah, to head, bacteriology department, University of Idaho. . . . **Stanley P. Hazen**, chairman of postgraduate peridontology, Temple University, to chairman, peridontology department, University of Connecticut. . . . **Gordon R. Borr**, acting chairman, chemical engineering department, University of Idaho, to academic dean at the university. . . . **Harold W. Moore**, associate professor of chemistry, University of California, Irvine, elevated to chairman of the department. . . . **Lorrin Kennamer**, dean of arts and sciences, Texas Technological University, to dean, College of Education, University of Texas. . . . **Robert P. Boynton**, professor of government and public administration, American University, to dean for graduate studies and research at the university. . . . **William L. Franzen**, professor of education and assistant dean, College of Education, University of Toledo, to dean, School of Education, University of Missouri, St. Louis. . . . **James Heald**, professor of administration and higher education, Michigan State University, to dean, College of Education, Northern Illinois University. . . . **Lewie Burnett**, chairman of education, California State College, Hayward, to dean, School of Education at the college. . . . **Thomas F. Malone**, professor of physics, University of Connecticut, to dean, Graduate School at the university. . . . **Patrick R. Wells**, acting chairman, pharmacology department, University of Nebraska, to dean, College of Pharmacy, Texas Southern University. . . . **Eugene H. Cotta-Robles**, special assistant to the chancellor for academic programs, University of California, Riverside, to chairman, microbiology department, Pennsylvania State University. . . . **John Cross**, assistant professor of psychology, St. Louis University, to chairman, social sciences department, College of the Virgin Islands.