

without paint, showed the highest levels of lead in their bodies. Even the carcasses of dead mice found inside and outside the zoo buildings were loaded with lead.

Lead poisoning of animals apparently is not confined to the Staten Island Zoo. The same doctors made a preliminary investigation of animals in the Bronx Zoo and turned up the same problem, although fewer animals seem to be affected.

Originally an occupational hazard, lead poisoning in recent years has been identified in slum children who eat chips of paint in old, dilapidated buildings (*Science*, 5 September 1969). Several studies have found an increasing concentration of lead in the air over many cities. And, although the question has been raised, little is known about the effect of this lead on the cities' inhabitants.

It is known, however, that increasing exposure to lead in the air can increase the amount of lead in a person's blood. And a recent position paper drawn up by the Air Pollution Control Office of the Environmental Protection Agency concluded that atmospheric lead pollution does indeed pose a health hazard, particularly for children exposed to lead from other sources.

Since there is little data on the levels of lead in the bodies of adult residents of New York, the findings from the zoo animals cannot be compared with those from the human population. But the wide range of species that were affected in the zoo seems to indicate that man might well be in danger. One of the difficulties in detecting widespread lead poisoning is the lack of specific symptoms. For many years, the headaches and listlessness experienced by slum children who were suffering from sub-clinical cases of lead poisoning were overlooked by doctors—simply because they were unaware of the problem. And so it could be with some of the city's residents who simply breathe the city air.

Over the past few years, however, New York City has compiled a good deal of data on levels of lead in the blood of children. And according to Vincent Guinee, director of the New York lead poisoning prevention program, there is no apparent correlation between levels of lead in children's blood and those areas of the city in which airborne lead pollution is highest. "I would therefore doubt," said Guinee, "that the animals in the zoo

developed clinical symptoms just from breathing the air. But," he added, "I'm prepared for surprises."

The NYMC researchers intend to continue their investigation, in order to correlate their findings in the zoo ani-

mals with the surrounding human population. "The zoo animals," said Strebel, "could potentially serve as barometers of the medical effects of the variety of pollutants in the city's air."

—ROBERT J. BAZELL

## Public Interest: New Group Seeks Redefinition of Scientists' Role

A small group of scientists has formed a new public interest group to explore the frontiers of social responsibility in science and push the members of their profession into a keener appreciation of the significance of their roles in society. The latest addition to what might be called the non-Establishment scientific establishment is the Center for Science in the Public Interest, set up last January by four alumni of Ralph Nader's Center for the Study of Responsive Law. The purpose of the group, according to James Sullivan, who has a doctorate in meteorology and oceanography from the Massachusetts Institute of Technology, is to stoke the social consciences of scientists and "establish the legitimacy of advocacy in the public interest." The group holds that scientists must make value judgments about their work at every level of scientific endeavor and that "the myth of objectivity is the worst myth we've got in the scientific profession."

The CSPI aspires to plant itself in territory that is at present only thinly inhabited—"the middle ground between science and law"—where it hopes to supply reliable and extensive technical input into decision-making processes, both in government and in the courts.

It has staked out three primary areas of activity: making available competent witnesses to testify at hearings on science-related legislation before Congress; conducting studies to supply consumers with information on matters about which data are either unavailable or obscured by conflicting sets of "facts"; and instigating its own lawsuits, as well as acting as co-plaintiff in public interest legal actions.

Of the four men comprising the organization, three are scientists and one is a lawyer. For at least two of them, experience working for Nader seems to have been the catalyst in turning them from scientists into scientist-advocates. Sullivan says that after he got his de-

gree last June he planned to spend a month working for Nader and then return to M.I.T., where he had been offered a job doing research on how to cope with oil spills. He ended up spending 6 months with Nader, upon which, "after much agonizing," he decided he couldn't go back to a job that was "just a cosmetic approach" to more fundamental problems.

Another man on the team is Albert J. Fritsch, a Jesuit priest with a Ph.D. in organic chemistry from M.I.T. One day, he says, he saw Nader make a mistake during a television appearance about the difference between two gases and decided that "he needed scientific input desperately." He joined the Nader group for a year and remains one of their scientific consultants. The other two CSPI men are Michael Jacobson, a microbiologist from M.I.T., and Kenneth Lasson, a Maryland lawyer.

The group feels that most scientists, in the effort to preserve the purity of their work, deliberately avoid making any but practical, technical judgments about what they are doing. They thus fall, inadvertently, into the role of advocate of the particular interests of their employers. The country's number one example of this phenomenon, says Sullivan, is presidential science adviser Edward E. David, who said in a recent speech that he believed the function of a science adviser should be to present options and not to pass judgments. "Advocacy and the traditional scientific approach are not comfortably compatible," he said. But David, says Sullivan, is clearly pushing his boss's policies—notably in his recent efforts to sell the SST.

The CSPI thinks a different kind of advocacy is called for from scientists, one based on thorough consideration of the implications of their work, with priority given to the interests of the public rather than the interests of their employers. Each individual has to assess



Albert Fritsch and James Sullivan

the impact of his own work because, says Fritsch, all laboratories have a vested interest in the institutions that support them. "We have no real independent laboratories—we're just now getting the first inkling that we need these labs."

The CSPI is ready with a number of cases to illustrate the fact that scientists, however honorable, tend to come out with different conclusions depending on whom they work for. For instance, the Department of Health, Education, and Welfare and Allied Chemical Corporation conducted separate tests this year to determine the levels of mercury in urine samples taken from workers at Allied's chlorine and caustic soda plant in Moundville, W.Va. The government's tests (now being challenged by the company) revealed about three times as much mercury as the company's tests.

In another case that Sullivan cites, the Bureau of Mines (BOM), with the help of the American Petroleum Institute (API), conducted tests comparing leaded and unleaded gasoline. The tests indicated that unleaded fuel would have adverse effects on air quality because other necessary additives would give it a "higher photochemical pollution potential." These results have been attacked by the Air Pollution Control Administration, which said that BOM "functioned as a contractor working under the direction of an API task force" and that the API selected the fuels and other variables to be used in the experiments. (The BOM says API supplied some money and advice, but exerted no control over how tests were conducted.)

Prompted by this conflict, Sullivan

is using all available literature (the Center has no laboratory facilities) in a study to determine just what the properties of all gasoline additives are and to recommend needed research and regulations.

Sullivan feels that the government's regular practice of including interested parties in its research contracts is inappropriate. Accordingly, he is also planning a broad survey of scientific testing and consulting firms, in the expectation of uncovering a variety of hidden conflicts of interest.

Fritsch feels that scientists, as a rule, "are enslaved to their institutions" and are "terribly confused" about their moral responsibilities as they come to realize that adherence to "objectivity" and company loyalty are inadequate as guides to professional obligations. In hopes of coming to a clearer definition of a scientist's moral role (and, perhaps, stirring up what Fritsch calls the "Uncle Toms in science"), CSPI is reviewing the codes of ethics of various disciplines to see in what respects they are inadequate to cover present-day complexities and where the spirit of the codes is being violated.

In connection with this effort, the group also works closely with Nader's new Clearinghouse for Professional Responsibility (*Science*, 12 February), which was formed to investigate cases in which employees feel their companies are engaged in dubious practices. "The Clearinghouse forwards some of its mail to us," says Fritsch. "They get more letters from scientists and engineers than from any other group."

But Fritsch thinks that, on the whole, scientists are more naive about their social responsibilities than are other

professional groups. The tight employment situation has temporarily swollen the number of "radical" scientists. "They get radicalized only to get themselves a job. They're disappointed with the system that cut them out of a job. As soon as they get a job, they're back in the system."

The CSPI is much like the dozens of little public interest groups springing up these days in Washington: it puts out a monthly newsletter and has a three-man advisory board starring John Gofman of the Lawrence Radiation Laboratory, an outspoken critic of the Atomic Energy Commission's radiation standards. However, CSPI seems to have found a niche unoccupied by any other science group. It operates within, not in opposition to, "the system," unlike the radical, grass roots-oriented coalition that calls itself Scientists and Engineers for Social and Political Action (SESPA). On the other hand, CSPI is more actively engaged in promoting change than is another group, the New York-based Scientists' Institute for Public Information, whose main product is information. Research activities of CSPI are similar to those envisioned by Gofman and Arthur Tamplin in their proposed Adversary System for Scientific Inquiry, in which independent groups would assess the negative implications of new applications of technology.

Despite its modest size and age, CSPI is chock-full of projects. Other studies now under way include Jacobson's book on food additives, entitled *Eaters' Digest*, and an investigation of the lethal properties of household chemicals and detergents. Sullivan is completing *Citizens' Handbook*, a "how to" guide that will furnish economic, scientific, and legal ammunition to people opposing highway construction. Finally, a research team of students and citizens from Appalachian states has been put together to examine whether and how strip mining can be banished from Appalachia.

The CSPI, which has projected a budget of \$50,000 for its first year, has been operating on a couple of foundation grants and expects to rely heavily on small contributions. No one is salaried. The scientists live off consulting fees and project grants, and Lasson, the lawyer, is employed by Goucher College. But they are determined to be beholden to no one, and money matters don't seem to worry them. Says Fritsch: "We'd rather be poor and have no strings attached."—CONSTANCE HOLDEN