

It is assumed that the Rothschild report, considering the source in the Cabinet Office, will express views acceptable to the Cabinet. Recommendations that some of the research councils be modified seem possible. And there is speculation that the Rothschild report may suggest that the structure of government science be changed so that at least some research will be handled in a way that conforms more closely to that employed in large corporations with successful research programs (such as Shell and British Petroleum). This would mean the adoption of a form of contractor-customer relationship, with a greater separation of roles between those who decide which research should be done and those who perform the research.

The scientific enterprise in Britain differs from its American counterpart in that it is designed to answer the helm more smartly. Pluralism in America

extends to the financing of research through a variety of government agencies at the federal, state, and even the local levels, as well as by private foundations and industry and by discretionary funds controlled by universities both public and private. The British have a system of national universities, with the bulk of funds for science being provided by Parliament. The University Grants Committee distributes funds for capital and operating budgets and thereby controls not only the size of faculties and the number of places for students, but the emphasis on particular disciplines. The research councils, at least until now, have exercised control over funds for research and graduate education. The British, therefore, have a centralized system that should be relatively responsive to changes in policy.

When this was written, speculation in Britain centered on the question of if

and when the two key reports, and particularly the Dainton report, would be made public. Although experience teaches skepticism toward the potency of reports, even by blue-ribbon panels, some responsible people in Britain believe that a damaging overcorrection in science policy is possible. While the influence of the scientists and the inertia in the system should not be underestimated, it is evident that the era of the blank check for science is at an end.

There are obviously some important similarities between those issues being raised in Britain and in the United States. The recent appointment of William M. Magruder (*Science*, 22 October) as a special consultant to the President on ways to promote technological pay-offs is a sign of the times in Washington. So it is fair to say that the contest in Britain is of special interest in the United States.—JOHN WALSH

Lead Poisoning: Combating the Threat from the Air

New York. There will likely be lead in the air here and in other cities for many years to come. On 5 November, New York City's Environmental Protection Agency will hear an appeal from Mobil Oil Company to hold back on the city's requirement for a phase-out of all lead antiknock compounds in gasoline sold in the city. Passed last August by the city council, New York's antilead ordinance requires a stepwise reduction to 2 grams of lead per gallon of premium gasoline and 1.5 per gallon of regular this month, and to no lead in any gasoline by 1 January 1974.

The New York law is, to date, the only antilead regulation in the country, and the fight that will surround New York's efforts to implement it is likely to be reflected in similar efforts to eliminate lead from gasoline in other locations and on a nationwide basis.

Mobil objects to the law, according to a spokesman for the company, both because the timing requires unreasonable expenditures for the company, and because the federal Environmental Protection Agency (EPA) will soon pass

regulations superseding the New York City law. If the city denies Mobil's request for a variance from the regulations, the company is likely to appeal through the courts.

Irwin Auerbach of EPA's air pollution control office told *Science* that EPA will publish some sort of lead-control regulations by the middle of December, with 30 or more additional days allowed for comments. The regulations, he said, are not yet agreed upon. They could be based on one law or on a combination of laws focusing on auto emissions or on lead's threat to health and safety, or both. At the very least, the federal lead-control rules will require that lead-free or low-lead gasoline be available for 1975 model cars, which will be fitted with lead-sensitive catalytic mufflers to control polluting emissions. Depending on their nature, the federal rules could supersede any state or local laws, but this will not necessarily be the case.

Over 180,000 tons of lead annually spew into the air in the United States from the tail pipes of automobiles,

trucks, and buses. Lead poisoning, originally an occupational disease, has also become a disease of urban slum children, who eat the paint crumbling off the walls of dilapidated housing. In recent years, moreover, concern has mounted over the possible effects on health of the poisonous metal in the atmosphere—particularly in urban areas where lead is often found in the air, dust, and soil in levels that many experts believe to be unsafe.

While the scientific data implicating airborne lead in the concentrations found in our cities as a threat to health are as yet incomplete, few would argue that the lead residues in our environment serve anything but detrimental functions. A position paper from EPA's Bureau of Air Pollution Sciences declared that lead in the air does indeed pose a hazard, particularly to children exposed to lead from other sources. "The magnitude of the problem," the report said, "hardly justifies a 'wait and see' attitude, for acute poisoning is associated with a high percentage of irreversible central nervous damage in children, and repeated exposure to high environmental levels of lead greatly increases the risk of irreversible damage."

Similarly, a report prepared for EPA by a committee of the National Research Council found that "the level of lead in ambient air poses a significant threat" in infants and small children. The same report noted that "the

air over the largest American cities has a concentration of lead 20 times greater than the air over sparsely populated areas of the country and 2000 times greater than the air over the mid-Pacific Ocean."

In New York City, for example, the air measure at 10-story heights around the city varies from 1.2 to 2.7 micrograms of lead per cubic meter of air. But as the measuring devices are put closer to the traffic, the lead levels rise. Measurements taken 10 feet above the ground at 45th Street and Lexington Avenue showed a 24-hour average of 7.5 micrograms, with some readings as high as 34 micrograms.

On 9 July, *Science* reported that investigators at the New York Medical College discovered a number of animals at the Staten Island Zoo to be suffering from lead poisoning, with atmospheric lead suspected as one of the major contaminants. The same investigators discovered that the dirt and leaves in the park surrounding the zoo contained as much as 3900 micrograms of lead per gram of dry weight—an amount equal to or exceeding the levels found alongside heavily traveled expressways.

Yet zoo animals might not be the only victims of New York's leaded atmosphere. Early this year, two children living on the West Side of New York, 3-year-old Joshua Guenter and 17-month-old Natasha Babayan, were found to have lead concentrations in excess of 40 micrograms per 100 milligrams of blood—a value considered by New York health officials to be the upper range of normal. Neither child exhibited symptoms of lead poisoning, which can occur at a concentration of 60 micrograms. Nor were the concentrations in Joshua's and Natasha's blood especially unique. Some 25 percent of the 80,000 preschool children screened by the New York City lead testing program had lead concentrations of 40 micrograms or greater. What makes the case of Joshua and Natasha unique is that both come from middle-class homes, where there is apparently no peeling leaded paint on the walls for children to nibble.

At the insistence of Joshua's father, who is a district Democratic leader, the city's Department of Air Resources sampled the air both inside and outside the Guenter home and found surprisingly high concentrations of lead. Inside, the air showed an average of 2.5 micrograms of lead per cubic meter of air, with a peak reading of 6.1 micrograms. The outdoor average was 5.4

micrograms, with a high reading of 10 micrograms.

Exact correlations in the numbers game of lead in the air and lead in the body have not been determined, but studies have shown that people in occupations such as traffic policeman and garage mechanic carry greater burdens of body lead than is average for the population. Further, residents of homes within 250 feet of expressways are known to have more lead in their bodies than those living a mile or more away. An atmosphere of 6 micrograms of lead per cubic meter of air has been experimentally shown to increase coproporphyrin excretion (an indication of lead

intake) in 11-year-old children. And an atmosphere of only 2.6 micrograms over a 15-month period increased the lead concentration in the bones of mice.

The position paper from the Bureau of Air Pollution Sciences of EPA pointed out that, because of their higher metabolic rates, children would be more at risk from a given level of airborne lead pollution than adults would. "Under conditions of comparable environmental exposure," said the report, "a child would inhale two to three times as much of a given pollutant as would an adult on the basis of body weight."

City health officials are nonetheless skeptical that an imminent danger ex-

Reaction on Morningside Heights

There may yet be nuclear fission in Morningside Heights. On 27 October, the Atomic Energy Commission's Atomic Safety and Licensing Board heard arguments in an appeal to its earlier decision denying Columbia University a permit to operate a small nuclear reactor on the university campus.

Among those testifying at the appeals hearing was Ernest J. Sternglass of the University of Pittsburgh, who presented data purporting to show an increase in infant mortality in communities surrounding reactors similar to the 250-kilowatt Triga Mark II that Columbia hopes to operate.

Following 7 years of legal wrangling and intense opposition to Columbia's plans from a number of community and student groups, the licensing board's decision last April marked the first denial of an operating permit for a reactor in the United States.

The community groups, led by the Riverside Democrats, Inc., and the Morningside Renewal Council, Inc., had argued that the risk to the surrounding community—either from the small amount of radioactivity released by the reactor or from a massive rupture of one or more of the core elements—far outweighed any benefits to the community. Columbia and the AEC (which supported the university's application) countered by claiming that the risks were small enough to be virtually nonexistent and that the community, though not necessarily those in the immediate vicinity, would receive such benefits from the reactor as radioactive isotopes for medicine.

In denying the permit, however, the licensing board refused to consider the risk-versus-benefit issue, citing instead a lack of clear standards for licensing a small reactor in a metropolitan area. Columbia and the AEC in their appeal claimed that such standards do, in fact, exist for larger reactors and should be applicable in this case.

The community groups also appealed portions of the original decision, even though it was in their favor. They claimed the board should have dealt with the risks-versus-benefits issue and that Columbia should have filed an environmental impact statement. Sternglass's testimony was offered as further proof of the risks to the community from the reactor.

When the licensing board agreed to hear Sternglass, however, they stated that his evidence would be considered only as a challenge to AEC standards for the levels of emissions from reactors and not as a specific argument against the Columbia reactor. The AEC submitted a mass of data to the licensing board supposedly countering Sternglass's finding.

The decision of the board is not expected for several weeks. The next step in the appeal process is the U.S. District Court of Appeals.—R.J.B.

ists from breathing the polluted air. "I would call it a potential problem with the accent on potential," said Vincent Guinee, director of New York's lead poisoning prevention program.

Guinee points to a lack of correlation between those areas of the city high in atmospheric lead and the cases he discovers through his screening program. Moreover, the incidence of lead poisoning peaks in 2-year-old children—in apparent correlation with their chewing habits. If the lead were coming simply from environmental exposure, reasons Guinee, the incidence would increase with age. Guinee and other city officials are reluctant to jump to any conclusions concerning Joshua and Natasha because of the variety of substances that contain lead, including pencil paint, some house paints sold as lead-free, and a variety of substances such as certain plastics used in children's toys. Also, a good deal of the lead in the dirt and dust in the city originates when old housing is torn down.

Less skeptical about the danger from lead in the air is a group of parents, calling themselves the "Get the Lead Out Committee," who banded together following the discovery of high concentrations of lead in the blood of middle-class children. "It's clear to me," said Paul Du Brul, an assistant to the Bronx Borough president and spokesman for the group, "that there are too damn many kids with too damn much lead in their bodies."

The Get the Lead Out Committee is pressing the city to initiate a massive program to sample the air at ground level and correlate the findings with epidemiological data on lead levels. City officials say they would undertake such a study if they had the staff funds. The committee also intends to keep up the pressure to get lead removed from gasoline. Says Du Brul, "We have to say no to the automobile industry. We've already done inestimable damage to our children."

The possible effects of subclinical doses of lead in children's bodies remain virtually unknown. Yet because of the wide range of effects on the body caused by higher dosages of lead, some pediatricians fear that the lead is unlikely to be totally harmless.

Moreover, studies have shown that lead does accumulate in the bodies of adults (in the United States, but not abroad) the longer they live. And this accumulation may be passed on from generation to generation. Shirhari Saka-

Correction

An article in *Science* (29 October, page 479) which alluded critically to a political appointee to a State Department environmental advisory committee, incorrectly identified the appointee as Mrs. Bruce B. Benson, president of the League of Women Voters. *Science* regrets the error and any injury done to Mrs. Benson's reputation and that of the League, and recognizes that they play respected roles in many governmental issues.

hadeo and Joseph Kochen, pediatricians at the Martin Luther King Health Center in the Bronx, are testing a number of newborn babies and finding most of them with lead concentrations of 20 and 30 micrograms per 100 milligrams of blood—concentrations similar to those found in their mothers. Thus children born in an urban environment may carry an elevated concentration of lead from birth, and thus be more susceptible to contamination from any source.

Added to the accumulation of lead from a steady environment is the problem that the concentration of lead in the air is actually increasing in several locations. Preliminary data from the industry-supported Seven Cities Study of Air and Population Lead Levels reveal that between 1961–62 and 1968–69 airborne lead concentrations at some sampling stations rose by as much as 32 percent in Cincinnati, 35 percent in Philadelphia, and 64 percent in Los Angeles. A recent study of the air on a mountain above San Diego shows the level to be rising by 5 percent per year. Isomeric studies of this airborne lead indicate that virtually all of it is the product of emissions from internal combustion engines.

Clearly, lead in the air presents a hazard—if not now, then in the near future. The next move is up to the EPA, with the new lead-control regulations to be published next month. Removal of lead from gasoline would involve massive economic considerations, and the EPA regulations, no matter how weak or how stringent, are likely to be the subject of intense squabbling for some time to come.

"And in the meantime," asks Mrs. Laura Sullivan, who is the head of the Get the Lead Out Committee, "just what is happening to the kids?"

—ROBERT J. BAZELL

APPOINTMENTS

Scott C. Daubin, chairman, ocean engineering department, Woods Hole Oceanographic Institution, to chairman, ocean engineering department, University of Miami. . . . **Hugh D. Graham**, acting director, Institute of Southern History, Johns Hopkins University, to chairman, social sciences division, University of Maryland, Baltimore County. . . . **Harry L. Holloway, Jr.**, professor of biology, Western Maryland College, to chairman, biology department, University of North Dakota. . . . **Jerome J. DeCosse**, professor of surgery, School of Medicine, Case Western Reserve University, to chairman, surgery division, Medical College of Wisconsin. . . . **Gilbert J. Mains**, professor of physics and chemistry, University of Detroit, to chairman, chemistry department, Oklahoma State University. . . . **Alexander Gottshalk**, professor of radiology, University of Chicago, to chairman, radiology department, biological sciences division at the university and the Pritzker School of Medicine. . . . **Clayton Rich**, associate dean for research and clinical affairs, University of Washington School of Medicine, to dean, Stanford University School of Medicine and vice president for medical affairs. . . . **Donald L. Kimmel, Jr.**, assistant professor of medical sciences, Brown University, to chairman, biology department, Davidson College. . . . **Ronald P. Kealy**, assistant professor of education, George Peabody College for Teachers, to chairman, education department, Frostburg State College. . . . **Kenneth G. Kersh**, dean, Pembroke State University, to chairman, education department, Hendrix College. . . . **Byong-suh L. Kim**, chairman, sociology department, Coe College, to chairman, sociology department, Montclair State College. . . . **Ellis R. Mottur**, director of the technology assessment project, George Washington University, to science adviser, Senate Committee on Labor and Public Welfare. . . . **Armand J. Silva**, associate professor of civil engineering, Worcester Polytechnic Institute, to head, civil engineering department at the institute. . . . **Harold Brody**, professor of anatomy, State University of New York, Buffalo, to chairman, anatomy department at the university. . . . **Russell C. Jones**, professor of civil engineering, M.I.T., to chairman, civil engineering department, Ohio State University.