ordeal of *Federal Register* publication (which has not happened yet), hearings, a hiatus for written comments, and agency review. In the meanwhile, the EPA has proposed to allow large and small refiners to continue doing roughly what they do now, which for some small companies means using as much as 2.5 grams of lead per gallon. Only the small companies that have opened shop since October 1976 will be held immediately to the new standard (1.1 grams of lead per gallon). They are crying foul.

Their cry has been heard. Consider the case of Wickland Oil of West Sacramento, California. Although it is a small blender that only began operating early this year, Wickland has found a voice in Washington, D.C. His name is John V. Diepenbrock, and he was chairman of the finance committee for Ronald Reagan's presidential campaign.

As an agent of Wickland Oil, Diepenbrock visited the U.S. Vice President's office on 16 June to meet with the Vice President's counsel, Boyden Gray, and with Gray's assistant, Frank Blake, who has been helping the OMB decide what should be done about leaded gasoline. Diepenbrock also met with high-level EPA officials Richard Wilson and Joseph Cannon on 17 June. Later, on 16 July, Diepenbrock met with George Bush. However, on this occasion, Diepenbrock says, he was not an agent of Wickland Oil, but of the Pacific Legal Foundation. The conversation did not turn to lead.

Wickland's immediate problem is that it has been buying one shipload a month (150,000 barrels) of gasoline made in Communist China. This gasoline, although leaded, is too low in octane to meet California's demands. Wickland adds more lead at a terminal completed last January (cost: $20 million) and sells the blend at its "Regal" outlets. The final product contains 1.3 to 1.4 grams of lead per gallon. A shipment of Chinese gasoline, already bought, is due to arrive in California in October, the very month the EPA has chosen to enforce its new rules. Wickland could lose some money.

Through Diepenbrock, Wickland told the EPA and the White House that it is being singled out for unfair regulation. The gist of its complaint is that its chief competitor, an older and bigger company—Tosco—is being allowed to get away with selling more highly leaded gasoline. This is possible because Tosco sells *unleaded* gasoline as well. Under regulations, which the EPA would like to abolish, Tosco is allowed to average its leaded and unleaded production to meet a numerical standard. Wickland produces no lead-free gasoline, and thus cannot benefit from averaging.

Wickland officials are deaf to the argument that they should have believed the EPA would enforce the intent of the law, which stipulated that small refiners would lose the exemption from lead controls on 1 October 1982. Wickland's spokesman William Silvia argues that if his company must lose its exemption, then everyone else must lose it at the same time. According to Silvia, company officials invested in the blending business on the assumption that the law would be changed in their favor. They still make that assumption.—ELIOT MARSHALL

The Risks of Living Near Love Canal

Controversy and confusion follow a report that the Love Canal area is no more hazardous than areas elsewhere in Niagara Falls

The senators and representatives of New York State admit to being highly confused about the events preceding the release of a federal report on Love Canal, a toxic waste dump in Niagara Falls. The reason, Senator Daniel Moynihan (D–N.Y.) explains, is that "an awful lot of on and off decisions" were made concerning whether the neighborhood around Love Canal is a safe place to live.

The final version of the government's report, released last month, suggests that the neighborhood is relatively safe. The area adjacent to the dump is generally recognized to be heavily contaminated with toxic chemicals but, the report says, most of the land nearby is just as habitable as that situated elsewhere in the city (*Science*, 20 August, p. 714).

This assessment has encouraged the state to consider resettling a portion of the neighborhood that was evacuated in May 1980, encompassing roughly 400 homes. The incentives for such a decision are financial and esthetic. The state has borne some costs associated with the evacuation and cleanup at Love Canal, some of which could be recouped through the resale of homes. Resettlement would also permit destruction of a chain link fence that now surrounds the evacuated area, removing a local eyesore and possibly improving the economy of Niagara Falls.

However, resettlement plans may be delayed until the Environmental Protection Agency (EPA) and state officials resolve the confusion and controversy surrounding the federal hazard assessment. The confusion stems largely from the fact that the conclusions of the report were modified twice shortly before its release. Initially, a panel of six federal scientists convened by the Department of Health and Human Services (HHS) agreed that resettlement of the area was acceptable. One month before the report's release, however, the panel withdrew this conclusion and stated that "no definite recommendations or conclusions as to the habitability or the potential human health risks of the Love Canal area can be made." One day before the report was released, the panel reversed itself again and reaffirmed its initial conclusion that the area is habitable.

Although this sequence of events can be readily explained, it has generated questions at Niagara Falls about the panel's commitment to its conclusions. Senator Alfonse D'Amato (R–N.Y.) and Representative John LaFalce (D–N.Y.), who is from Niagara Falls, have suggested that the HHS panel was pressured at the last minute into a decision in favor of resettlement. "This conclusion was reached because EPA put the pressure on and state officials put the pressure on," D'Amato told HHS assistant secretary Edward Brandt during a hearing on 4 August. "That's just not accurate," Brandt replied, and his denial was supported by panel representatives. The charge has proved more popular than the denial, however, and residents of Niagara Falls are now deeply divided over the wisdom of resettlement. The Love Canal Homeowners Association opposes it.

HHS first became entangled in this muddle in March 1981, 7 months after the EPA had gathered information on chemical contamination near the canal. The data indicated that the 21,8000 tons of chemicals in the dump had leaked only

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to a limited extent. EPA asked HHS to examine the data and predict whether adverse health effects would result from resettlement of the evacuated area. At almost the same time, EPA asked the National Bureau of Standards (NBS) to verify the reliability of the data. HHS agreed to the review, but carefully stated that no conclusions would be drawn if the NBS examination unearthed any serious problems.

By all accounts, HHS performed its task conscientiously. A panel of scientists met with EPA in May 1981 and concluded that the information from the agency was too jumbled to be of any use. By August, EPA's report had been through several more drafts and another meeting was held, this time including 11 nongovernment scientists appointed by HHS as consultants. Five of the consultants reported later that the data were still in poor condition. Steven Aust, a biochemist at Michigan State University, said for example that "composites were uninterpretable . . . the maps and tables were not adequately described, difficult to read, and frequently difficult to interpret." Along with four other panelists, Aust said that he felt "very uneasy about drawing any firm conclusions from the data presented."

A majority of the panel had more confidence, however, and concluded that resettlement would not result in inordinate adverse health effects. After a brief review, the HHS scientists agreed, noting that the level of contamination throughout the neighborhood was "well below established regulatory or advisory exposure limits" and virtually identical to "control areas" elsewhere in the city. Their judgment on resettlement depended on several assumptions: first, that a continuing effort be made to prevent the migration of chemicals away from the canal; second, that EPA continue to consult with NBS and ultimately publish a more detailed final report; and third, that the decision be taken with a grain of salt. "Official safety limits have by no means been established for all possible chemicals, and they are developed for exposure to chemicals alone, not for combinations. Full data are therefore lacking on which to base truly complete judgments of chemical toxicity in the Love Canal setting," the HHS panel said.

EPA initially planned to issue a similar recommendation in favor of resettlement, but it dropped the idea last May, when—in a scathing critique—NBS raised serious questions about the EPA data. NBS said that EPA had failed to account for wide variation in the quality of the information it had received from different laboratories. This created concern at HHS that its scientists would be stuck on a limb by themselves, and led to a withdrawal of the HHS conclusion. "In view of the criticisms and concerns raised in the NBS report, we must modify the tentative conclusions expressed in our earlier report," the HHS panel decided on 15 June.

The timing of the withdrawal could not have been worse because that was the day that three senators, including the chairman of EPA's oversight committee, wrote to the agency demanding a prompt release of the report, along with the HHS assessment. Earlier such requests had been made by Representative LaFalce. Through a bureaucratic slip, EPA responded to these requests before taking notice of the HHS withdrawal. The agency promised that everything would be released no later than 15 July, and found itself in a fix.

As that date neared, EPA, NBS, and HHS conducted frenzied negotiations to see if some conclusions about resettlement could still be drawn. On 8 July, NBS agreed to withdraw its challenges to the validity of EPA's data, on a condition that EPA delineate the problems with laboratory performance in its final report. Five days later, within hours of

How Safe Is Niagara Falls?

An interesting discovery of the new federal study on the waste dump at Love Canal is that Niagara Falls—the town in which the dump is located—is itself heavily polluted with substances that may create adverse health effects. These range from cancer-causing chemicals to hazardous pesticides and heavy metals that may create teratogenic and other toxic effects.

The soil in areas of the city distant from the dump contains benzene. The drinking water contains chloroform and toluene. The air contains benzene and tetrachloroethylene. Shallow ground water contains the pesticides heptachlor, aldrin, phenol, and BHC. Ground sumps were found to contain DDD, DDT, and Aroclor. Samples of sediment below surface waters were contaminated by DDE, chloroform, toluene, and anthracene. Arsenic, beryllium, cadmium, chromium, copper, lead, nickel, and mercury were found in virtually every sample throughout the city.

The reason for widespread contamination by these substances may be the presence in Niagara Falls and the nearby town of North Tonawanda of at least five major chemical companies and the existence of several waste dumps besides the one at Love Canal. The Environmental Protection Agency (EPA), which gathered the samples, notes that none of the substances was discovered in amounts that exceed existing federal standards. It also said that comparable levels of pollution exist in the environments of many other urban areas.

Nonetheless, the discovery bears on the risks of living in the vicinity of Love Canal because the Department of Health and Human Services (HHS) concluded only that this area was as habitable as areas elsewhere within the city. James Whittenburger, a physiologist at the Harvard School of Public Health who reviewed the study for HHS, questioned whether this was an appropriate comparison. "Since Niagara Falls has so many hazardous waste dumps, active or inactive . . . the concept of 'control area' is questionable in Niagara Falls," Whittenburger said.

John Deegan, who coordinated the EPA study, says that "to the best of our ability, we tried to prevent sampling near areas of known hazardous waste sites." He also says that the levels of contamination were low and similar to those discovered by pollution monitoring systems elsewhere in the country. He acknowledges, however, that "Niagara Falls is a chemical industry town."

Robert Metcalf, a University of Illinois biologist who also reviewed the study for HHS, concluded bluntly that "there is a measurable hazard in lifetime exposure to the polluted atmosphere of the city of Niagara Falls itself." But Robert Neal, the president of the Chemical Industry Institute of Toxicology, concluded after his review that there was little risk because the levels are "much lower than allowable concentrations in the industrial work environment." A panel of scientists at HHS agreed. "We judge that levels of organic chemicals in the low parts-per-billion range present minimal health risk," the panel concluded.—R. JEFFREY SMITH

the report's promised release and with a new letter outlining NBS's position, the scientists on the HHS panel reversed themselves again, and stated once more that resettlement would pose "minimal health risk."

David Rall, director of the National Institute of Environmental Health Sciences and a member of the HHS panel, says that "we had two choices: we could agree with the resolution of the issue or start an entirely new review of the data. In the best of all worlds it would have been nice to have another 2 months to go back and look at this. But we relied on the statements of several of our panel members, who had been at the meeting with EPA and NBS, that the questions [about the data] were being resolved." Brandt agrees. "We were not under any pressures from EPA that I am aware of," he says. The only apparent pressures came from the residents of Niagara Falls and their elected representatives, who repeatedly pressed for the report's release, both officials say.

In retrospect, Brandt thinks that HHS might have avoided the embarrassing reversals of opinion by directly assessing the data's validity—rather than relying on the assessment by NBS. This would have avoided the appearance of undue last-minute NBS and EPA influence on the HHS conclusions. Alternatively, HHS might simply have waited until the NBS review was complete and the EPA report was in final form, before issuing its own conclusions.

The tendency in Congress is to view such last-minute shifts as evidence of connivance among the agencies to develop the least alarming conclusion about the canal. The evidence is entirely circumstantial, however, and could just as easily represent a reasonable attempt to develop a useful recommendation under difficult circumstances. Given the statements of HHS officials and scientists that unsavory pressures were not brought to bear, the evidence tilts in favor of an honest approach.

The irony is that without the congressional pressure for publication of the report in July, HHS and NBS would undoubtedly have reevaluated the final EPA report on Love Canal more carefully. The reason that some congressmen may be confused about the report is that they helped bring the confusion about.

—R. JEFFREY SMITH

British Universities in Turmoil

Already reeling from sweeping budget cuts, they now face the prospect of increased central control over research policy

London. Early in July, Britain's Secretary of State for Education and Science sent a tremor through the nation's universities by hinting that the government might soon take a much more direct role in determining their teaching and research programs.

Secretary Keith Joseph's remarks, expressed with a certain British understatement, potentially represent the most significant shift in British higher education policy since the massive expansion of the 1960's. Joseph's views must be seen against a background of broad cuts in government support of the universities, with thinly veiled threats of further action if they do not go along with government policy.

In the past, British universities have fiercely guarded their internal decision-making against government interference. The University Grants Committee (UGC) receives a lump sum from the British Treasury—about $1.92 billion for the 1982–1983 academic year—and distributes this to individual universities as "block grants." Each is then, in principle, free to decide how the money should be spent.

Joseph, in a letter to UGC chairman Edward Parkes, has suggested that the time may be ripe for a shift in responsibilities. The letter asks the committee for its views on priorities in specific areas of science and technology "which are, or may be of particular relevance to industry." But it also says that, because policies for the universities must take account of national needs, "it might be appropriate for Ministers to take more responsibility than they have hitherto for determining priorities affecting the broad character of the allocation of resources to universities."

This policy shift could have important implications in the long term, but the cuts in university support are already causing severe anguish. Last summer the government announced that, as part of a general package of public spending cuts, British universities would receive 15 percent less money in real terms in 1983–1984 than they had in 1980–1981. For individual universities, the cuts ranged from 1.5 to 44 percent.

So far, the cuts have been directed at teaching rather than research. As in the United States, the science budget has been one of the few academic areas of spending to emerge almost unscathed from the public expenditure review. In particular, the Department of Education and Science's (DES) five research councils, which fund academic research, are still anticipating a budgetary increase in line with the projected rate of inflation—meaning zero growth in real terms, but not the contraction anticipated for the rest of the university system.

The problem for science, however, emerges from the unique British arrangement known as the dual support system, in which both universities and the research councils share responsibility for the health and support of university-based science.

The principle of the dual support system is that universities should, through their UGC funds, provide a basic "floor" of support for both teaching and research. Research council support is confined to the additional expenditure incurred by individual research projects, for example, for extra staff or equipment, and is only provided to universities able to demonstrate their research base is already sound. This contrasts with the U.S. approach, in which support services are paid in part from overheads on research grants.

The system worked well during the period of steady postwar expansion in both teaching and research budgets. But over the past decade it has shown increasing signs of strain as this expansion has come to a halt. Not only does static funding mean that new activities can only be started if old ones are abandoned, but the two components of the dual support system are experiencing different types of internal pressures.

The research councils in particular are becoming concerned that many universities, in deciding how to allocate the UGC-mandated cuts, are finding it less

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