EPA May Allow More Lead in Gasoline

While refiners seek to drop lead standard, health officials say the evidence of toxic effects among children grows stronger

For the first time in a decade, the National Petroleum Refiners Association (NPRA) has found an administration that may be willing to drop the federal controls on lead in gasoline. Despite evidence that auto fuel contributes to the pandemic of lead ingestion among children, the Reagan Administration has proposed to relax or rescind the rule that since 1973 has limited the use of lead as a cheap gasoline additive. Hearings are scheduled on 1 and 2 April at the Environmental Protection Agency (EPA) in Washington, D.C.

In making this proposal, the EPA is bending to the Administration's general goal of reducing constraints on industry. Indeed, the agency estimates that refiners may be able to save $200 or $300 million if they are given a free hand with lead. But in making this particular proposal, the EPA may be stepping into a fire storm. Health data published just last fall seem to indicate that the worst suspicions about lead pollution are true: that even at very low levels of exposure—the kind that city-dwelling children commonly receive—lead may cause significant damage to learning ability.

The chief sources of high-level exposure to lead, according to the Centers for Disease Control (CDC), are paint, soil, and dust. Airborne lead, coming primarily from auto exhaust, may account for 20 percent of the lead found in blood samples. Although airborne lead is not considered a high-level source, it is the most widespread and most easily controlled form of pollution. As a CDC official describes it, exposure to lead in gasoline sets the baseline for most people, determining whether or not they can tolerate a dose of lead from a high-level source such as paint.

Urvan Sternfels, executive vice president of the NPRA, says that the refiners have been leading the fight against EPA's lead controls since they were first proposed a decade ago by an earlier Republican administration. At that time, Richard Nixon's EPA turned aside the refiners' pleas and adopted a rule that, along with the forced use of catalytic converters, reduced the sales of leaded gasoline tremendously.

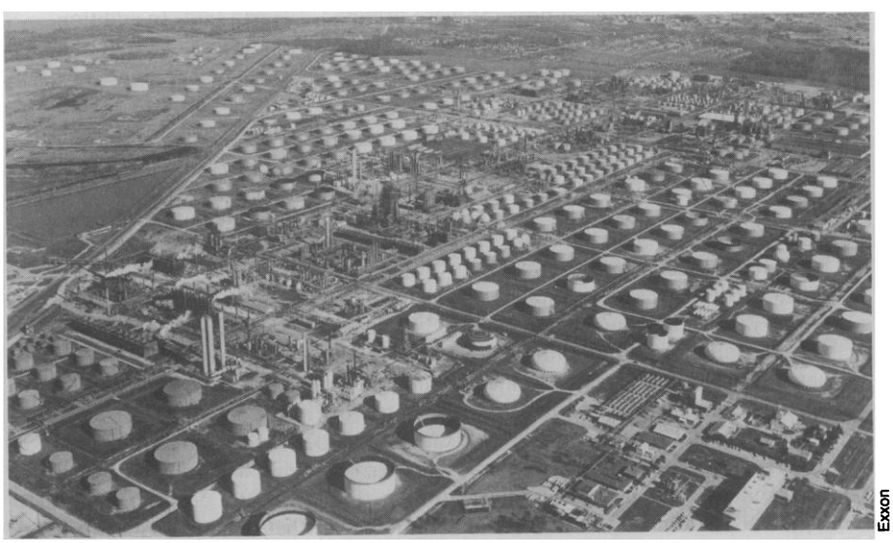
Today about 50 percent of the gasoline on the market is nonleaded, and much of the rest is low in lead, as mandated by the EPA. All the big refineries and many independents have made the investment necessary to comply with the reduced lead standard. But some smaller NPRA members have not made the change, claiming it would bankrupt them. As small refiners, they were given until October 1982 to meet the same standard being applied to the big boys. So shortly after Reagan's inauguration, the NPRA petitioned the White House for relief from what it considered an onerous regulatory burden.

The appeal went to the special task force on regulatory relief headed by Vice President George Bush, himself a former oil man. Although the refiners at first asked for a modest revision of definitions and deadlines, the warm reception they received encouraged them to ask for more. They said they wanted a complete abolition of the lead standard.

The Vice President's task force liked the idea. The lead rule was added to a priority "hit list" of federal regulations to be considered for immediate revision. The order went to the EPA. Following instructions, the EPA made a review and discovered, to nobody's surprise, that little attention had been given to the cost of imposing the low-lead rule at the time it was adopted. An economic study was commissioned. And on 22 February the EPA published in the *Federal Register* (page 7812) a request for comments on proposals to relax or abolish the lead rule.

The refiners' objective in this campaign is the same as in the past: to reduce operating costs and avoid what are viewed as unnecessary investments in refining equipment. There are two ways to convert low-grade fuel into the better quality (no-knock) gasoline required by many automobile engines. One is to blend the low-grade stock with high-grade fuel. To do this competitively requires sophisticated refining equipment capable of producing clear fuel. It is expensive. The other approach is to mix low-grade fuel with relatively large quantities of antiknock chemicals produced by other companies, the cheapest of which in most locations is a lead-based compound, tetraethyl lead.

At present, the EPA restricts large refiners to producing gasoline whose volume, averaged each quarter, contains no more than 0.5 gram of lead per gallon. Since half the gasoline the big companies produce is unleaded, their leaded gasoline actually contains about 1 gram of lead per gallon. Small refiners, depending on size, may produce gasoline containing between 0.8 and 2.65 grams per gallon, but they have been on notice that they would have to meet the universal standard of 0.5 gram by October 1982. Thus, the EPA's new proposal would "suspend" the October deadline for



Exxon

Kicking the lead habit

Major refiners like Exxon have invested heavily in lead-free technology. Smaller companies that have not would like to end EPA's controls on lead in gasoline.

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small refiners and consider relaxing or ending what is known as the lead phase-down program for all other refiners.

Although the refiners have been consistent in their objective, their argument for dropping the lead rule has shifted a bit over the years. Today opponents of the lead rule do not say that there is little health risk associated with leaded gasoline. Instead they argue that most of the risk was eliminated when the majority of the industry shifted to producing no-lead and low-lead gasoline. The change occurred quickly because American cars built after 1975 cannot tolerate lead. Their catalytic converters, installed to scrub other pollutants from the exhaust, can be "poisoned" if exposed to leaded gasoline.

The NPRA claims that the design of the American auto is not going to change soon; that unleaded gasoline will continue to dominate the market; and that a "natural phase-down" of lead will occur during the remainder of the decade as new cars replace old lead-tolerant models. The big companies will have to produce no-lead gas to stay in business. In short, the NPRA says, there is no reason for the government to enforce a low-lead standard on small refineries that have held out against it for so long. Economic forces will see to it that lead pollution from gasoline will stay at or below its present level. Sternfels adds that if by some fluke the auto companies should make a car that tolerates leaded fuel, the EPA will have ample time to reimpose the low-lead rule before the new models roll off the production line.

More important, perhaps, NPRA members feel threatened by what Sternfels calls a loophole in the regulation. Because of the way the law is written, small entrepreneurs, whose only business is to blend gasoline, have been allowed to call themselves small refiners and use the EPA's exemption to great advantage. An executive at one independent oil company points out that the number of gasoline blenders increased by 25 percent between 1980 and 1981, during a period when about 40 genuine refineries went out of business. According to Sternfels, these small-time blenders are finding it profitable to lease tanks, buy low-grade fuel, mix it with large quantities of lead, and peddle their wares under the EPA's privileged small refiner category. Gasoline from these sources has been found to contain as much as 3 grams of lead per gallon, Sternfels claims. Because the EPA's averaging procedure allows some flexibility, it is possible to comply with the low-lead rules by juggling inventories. Furthermore, many producers may use the same blending station, each taking advantage of its special status. Sternfels says that small refineries are finding it hard to compete in these circumstances, and some are tempted to copy the blenders or join forces with them.

These high-lead blending stations would go out of business in October if the EPA's universal lead standard were to go into effect as scheduled. However, because some NPRA members say they cannot afford to meet the 0.5 gram standard, the association has been pushing for a general relaxation rather than a reform of standards. NPRA has not asked simply for a tighter definition of "small refiner."

One of the ironies of the successful campaign to reduce lead in gasoline is that it started as a plan to protect a piece of machinery—the catalytic converter—and inadvertently protected thousands of children, says Vernon Houk, acting director of the Center for Environmental Health, which is part of the CDC. Houk ran a nationwide program that screened millions of children for lead poisoning and directed attention to those needing help. Last year, for example, the program screened 550,000 children and identified 26,000 with elevated lead levels.

The proposal to end controls on leaded

Biotech Firm Lays Off 135

Bethesda Research Laboratories (BRL), Inc., one of the few biotechnology companies to turn a profit, recently laid off 135 employees, in part because of insufficient cash flow. The layoffs come at a time when the privately held company, which projects $20 million in sales this year, was flush with new activity. Just six weeks ago, it started up a new instrumentation division that is marketing two new machines to analyze and synthesize genes. According to one dismissed scientist, company executives decided to retrench after apparently concluding that the firm was overextending itself in too many areas.

BRL, which was founded six years ago by Stephen Turner and is a principal producer of restriction enzymes, abruptly gave notice to a third of its some 400 employees on 18 February. Among those laid off were 9 or 10 Ph.D.'s from several divisions; BRL employed more than 50 scientists. Company spokeswoman Michelle Hartz said that the firm has "restructured" itself partly as a result of recommendations made last fall by its board of scientific advisers, but she declined to elaborate. Based on the board's suggestions, three departments were "reduced but kept intact"—the new instrumentation division, the molecular diagnostics division, and the products division. The products division, which sells a wide range of products for biotechnology research, is the most profitable part of the firm. In the company's fourth department, the genetics division, headed by Peter Kretchmer, "a number of projects were dropped," Hartz said. In addition, BRL has put a hold on the construction of new headquarters in Frederick, Maryland, although ground was broken just last November. The new facility would have consolidated operations currently scattered in several locations in the Washington, D.C., area.

The cause of the company's financial woes are not clear but its financial resources were apparently stretched too thin. Hartz said that securing loans for the company was "less the issue than the fact that our output of funds has been greater than our input. We're less insulated than our competitors who are publicly held." R. M. L. Buller, who is one of the scientists dismissed, said that the company "was trying to expand in too many areas with only one division making money." Buller, who was marketing manager for restriction and modifying enzymes, said BRL was ready to go public several times, but Turner decided against it, perhaps for two reasons. He speculates that Turner wanted to keep control over the company, and at the same time, the golden glow of biotechnology stocks had dimmed on Wall Street. The company is not lacking for expertise, "only dollars and cents," said Buller, who is considering returning to his former position at the National Institutes of Health. He added, however, that the layoffs may hurt BRL more than help "because people don't need that kind of security."

—MARJORIE SUN

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gasoline, Houk says, "is not in the interest of the children of the United States." Recent government actions have upset Houk for two reasons: First, they could make possible an increase in airborne lead pollution, and second, the Administration has just dismantled the CDC's system for monitoring and protecting children against lead poisoning. The CDC budget of $10 million for screening children has been cut to $7.5 million and transferred into a $300-million block grant program run from the central offices of the Department of Health and Human Services. There the program will be in danger of losing its identity, if not its life.

Houk unequivocally finds a link between the use of leaded gasoline and high levels of lead in the blood. He mentions that his samples, taken from children in 60 cities, show that the mean lead level in blood declined from 1977 to 1980 by 25.6 percent. This surprising figure has been carefully examined. Houk says he is virtually certain now that it was not produced by a statistical anomaly: "We know that this was a real reduction," he says, and "the only thing we know that changed in the environment during that time was that there was a 30 percent reduction in the amount of leaded gasoline used in this country."

The toxic effects of high doses of lead are well understood and documented. More worrisome, research done in the last 3 years shows quite convincingly that there is a relationship between the amount of lead a child ingests and problems in thinking and learning. Furthermore, this sort of poisoning appears to be caused by what until recently were considered "safe" levels of lead exposure.

By all accounts, the best evidence of this phenomenon appeared in a study published in 1979 by Herbert Needleman, now at the University of Pittsburgh Medical Center. His work has now been confirmed by two independent studies published last September, one conducted in West Germany by G. Winneke, and the second in England by W. Yule.

Needleman recruited teachers in the schools of Boston to play tooth fairy and collect a baby tooth from each pupil. The teeth were sawed open and analyzed for lead. The children were then divided into a high-lead and a low-lead group, and the two groups were compared with regard to scores on IQ tests and teachers' reports. The mean IQ of the high-lead children was four points lower than that of the low-lead children, and the teachers consistently rated the high-lead children worse on 11 behavioral qualities such as "distractible," "frustrated," and "unable to follow sequences." The bad scores were clearly dose-related as well, bringing Needleman to the conclusion that "lead may increase the risk of undesirable behaviors in the classroom at doses considerably below those found in our group with high lead levels."

Lead poisoning has some unique and ugly aspects. First, it is difficult and expensive to spot at low doses. It can only be detected with confidence by using the kind of blood sampling that the CDC has been told to stop doing. Second, the effects may be pernicious and long-lived, since they seem to impair the neurological development of children, creating intellectual deficits. Third, the

Watt and the Wilderness

Secretary of the Interior James Watt pulled a fast one on the environmentalists recently. Interviewed on the Sunday television show "Meet the Press" on 21 February, he announced an apparent turnaround in the Administration's policy toward the wilderness. Despite his persistent calls to "open up" wilderness areas for oil and minerals development, he told interviewers that he was recommending legislation to safeguard wilderness from development for the rest of the century. Newspaper reports of the announcement the following day included guardedly favorable comments from environmental groups.

That was before they saw Watt's actual legislative proposal, which was introduced in the House on 24 February by Representative Manuel Lujan (R–N.M.). Environmentalists are horrified by the proposal. The Wilderness Society issued a press release accusing Watt of a "massive public relations deception," and nine environmental groups promptly signed a letter sent to all members of Congress in which they labeled the Interior measure an "anti-wilderness bill."

Basically, the measure would nullify the fundamental thrust of the Wilderness Act of 1964, which is to close the wilderness system permanently to new mining claims and mineral leasing by the end of 1983. Watt's proposal, the Wilderness Inventory and Protection Act, would close the system to such claims immediately, but only until 2000. Furthermore, it includes a provision allowing the President, without congressional concurrence, to issue an order opening lands to mineral activities if he decides there is an "urgent national need" for specified resources.

The legislation also establishes what environmentalists claim are unrealistic deadlines for additions to the wilderness system. Currently there are 80 million acres in the system, 56 million of them in Alaska. An additional 7.3 million acres of National Forest Service land currently await wilderness designation by Congress; 12.2 million more acres are still under study for possible inclusion. Another 24 million acres are being studied by the Bureau of Land Management in accordance with the Federal Land Policy and Management Act of 1976. The bill would give the President unilateral authority to release them from wilderness study status and open them to development. National forest lands, which are managed by the Department of Agriculture, would be permanently released from consideration as wilderness areas if they are not recommended for inclusion in the wilderness system by 30 September 1985, or placed in the system by the end of 1987. Thus, in absence of new congressional legislation, additions to the wilderness system would be impossible after 1987.

Watt's proposal would retain prohibitions on exploratory drilling in wilderness but would permit mineral probes, including seismic surveys. It also would prohibit establishment of "buffer zones" around wilderness areas.

Watt said in his television appearance that this proposal was a "change of tactics" but not of goal. The Interior Department has gotten into political trouble in the West by breaking with the policy of past administrations not to grant oil and gas drilling leases in wilderness areas. By calling for an immediate prohibition on leasing, says Tim Mahoney of the Sierra Club, Watt can garner some short-term goodwill while holding fast to long-term designs.—CONSTANCE HOLDEN

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people worst affected are the least equipped to sustain the injury, being primarily poor black children of the inner city.

According to the National Center for Health Statistics, between 1976 and 1980 about 4 percent of all children aged 6 months to 5 years were found to have an elevated level of lead in the blood (at least 30 micrograms per deciliter, the level at which the CDC says therapy is indicated). Among rural white children, only 0.7 percent were found to have high lead levels. Among central city blacks, 18.6 percent had high levels of lead.

Needleman and Houk agree that the 30 microgram standard, until recently considered safe, may be too high. Houk says the first noticeable effects of lead on the metabolism occur at levels of 10 to 11 micrograms. Needleman says, "It's not clear what the highest safe level is. When I was a pediatric student, 60 micrograms was considered normal." If the EPA cancels the rule on leaded gasoline, Needleman says, the result will be predictable: "Blood lead levels will increase." Houk agrees.

In a memo dated 30 November 1981, Joel Schwartz of the EPA's energy economics branch summarized the virtues of decontrolling lead. His data were taken from a study done for the EPA by Sobotka and Company. Schwartz concluded that if the lead restriction were lifted, the large refiners would more than double the quantity of lead in gasoline, raising it from 1 to 2.5 grams per gallon. This would give the major refiners a windfall amounting to $133 million in the next 2 years, Schwartz figured. The small refiners, according to less reliable data, would gain $62 million in 1983. The grand total of this boost to the private sector in 1982 and 1983 would amount to about one-tenth of a cent per gallon for the big refiners and nine-tenths of a cent per gallon for the smaller ones.

Some may consider this worth the price in health risks. But officials in the public health community intend to make the contrary argument at the hearings in April. Houk says that no childhood disease even approaches lead poisoning in the breadth of its impact. Recent evidence suggests that the effects are magnified by poor nutrition. Houk worries that the decision to cut back food supplement programs may increase the lead poisoning problem even if no change is made in the gasoline rule.

"We have demonstrated that we can control lead in gasoline," Houk says, "and it just seems prudent to me that if you can do it, you should."

—ELIOT MARSHALL

Keeping the Door Open to Membership in IIASA

Federal budget austerity may not force an end to U.S. participation in the International Institute for Applied Systems Analysis (IIASA) near Vienna after all. The council of the National Academy of Sciences (NAS), which acts for the United States at IIASA, voted on 28 February to seek a workable compromise to allow continued U.S. membership.

When the $2.3 million required for U.S. dues for IIASA was eliminated from the National Science Foundation last year, NAS told IIASA that the United States would have to withdraw from the organization (*Science*, 11 December 1981, p. 1222). The IIASA governing body, in effect, declined to accept the resignation immediately and indicated a willingness to make concessions to keep the Americans in.

What is involved is not only a new financial structure requiring reduced U.S. payments, but also guarantees that U.S. national security interests are not being compromised at IIASA. Some critics have expressed concern that East bloc scientists working at IIASA have misused free access to data networks in the West.

Academy Foreign Secretary Thomas F. Malone says that the NAS council in deciding to "pursue continued adherence" to IIASA was convinced that the quality of work done there was high and that the institution was filling a unique role. He said that the council was also satisfied with the prospects of new financial arrangements and with an understanding that the "appropriate controls" would be placed on sensitive operations. Malone added that those recruited to work at IIASA would be rigorously screened to be sure they met the criteria of high scientific talent.

IIASA is in the process of replanning its program to make it possible to reduce its $10 million a year operating budget by about a quarter. Since IIASA was established 10 years ago the United States and the Soviet Union have each provided about 25 percent of the budget and the other 15 members split the rest of the bill. Under the smaller budget the U.S. annual dues and presumably the Soviets' could be scaled down to about $1 million. The next step for NAS is to go out and try to raise the money required.—***John Walsh***

Creationist Bill Fails in Maryland

The Constitutional and Administrative Law Committee of Maryland's House of Delegates held a 5½-hour hearing on a creationist bill 25 February. The impact of the recent decision (*Science*, 19 February, p. 934) on the unconstitutionality of Arkansas' creationist law was evident in the testimony. For this and other reasons, the vote, due imminently, is virtually certain to be negative.

The bill, which would require "reasonably unbiased presentation of creation-science and evolution-science" in public schools, is based in large measure on a draft currently being circulated throughout the country by creationist activist Paul Ellwanger (*Science*, 11 December 1981, p. 1224). Patrick Scannello, the bill's sponsor, notes that some minor changes have been made in the draft "to try to get round the judgment that struck down the Arkansas law."

Scannello, who freely admits his almost complete lack of familiarity with creationist literature, opened the hearing by reading a lengthy statement of detailed creationist arguments. He then hurriedly handed over to John Wisnewski, a salesman for a medical and scientific instrument company, who has been coordinating support for the bill. Eleven witnesses spoke in favor of the measure, stressing the fairness of presenting all scientific evidence relating to origins.

Twice as many witnesses testified against the bill. Scientists said that "so-called creation-science" is not science. Clergy pointed out that the view of origins encompassed in the bill represents just one narrow interpretation of the Bible. Parents expressed concern over the standard of their children's scientific education if the bill were to be passed. The Maryland State Board of Education, the Maryland Association of Science Teachers, and the Maryland State Teachers Association each expressed strong disapproval of the bill.

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