

**Weak U.S. regulation of lead in gasoline
contributes to casualties among the nation's children**

Get the Lead Out

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Most environmentalists and many other citizens have heard about children either dying or becoming mentally retarded from lead poisoning after eating chips of lead-based paints. A chip of paint the size of a thumbnail, eaten regularly by a child over a period of months, can and does cause such disasters. What most people may not have heard is that dirt and dust along heavily traveled city streets also pose a lead poisoning hazard.

Lead added to gasoline is pumped out the tailpipe of an automobile in millions of tiny invisible particles. These particles become a part of the air we breathe and the dirt and dust in which our children play. There is now as much lead in the dirt and dust on the sidewalks of our cities as there is in some lead ore—so much lead, in fact, that a child swallowing just one twenty-fourth of a teaspoon of dirt daily over a period of six to eight months can suffer lead poisoning. To visualize one twenty-fourth of a teaspoon of dirt, picture the amount of pepper on a couple of fried eggs. Eating this amount of dirt is easy enough for a child who, while playing on a sidewalk, licks a dropped lollipop today, a cookie tomorrow, or just sucks his thumb every day.

But when the question of lead in gasoline crops up these days in the media, or in conversation, will the focus of attention be on the health hazards of leaded gasoline? No, the focus is more likely to be on the more immediate effects of the gasoline-lead regulations recently promulgated by the Environmental Protection Agency.

By EPA regulation at least half the nation's gas sta-

tions are now required to sell unleaded gasoline. Purchasers of most 1975 cars will have to use unleaded gas to protect the catalytic mufflers which the auto makers are installing to meet air pollution standards. Such 1975 cars will have narrow-width fill-pipes to prevent the insertion of the wider nozzles used on leaded gasoline pumps. Unleaded gasoline pump nozzles will be narrower to fit into the 1975 cars.

Picture the motorist with a 1975 car who runs out of gas in a part of town where only leaded gas is available. The attendant, prohibited by law from pumping leaded gas into his car, looks the other way while leaded gas is pumped into an emergency gas can and then poured into the car's fill-pipe. The motorist who does this often enough will run the risk of ruining his catalytic muffler, which may cost him \$150 to replace.

Back in 1923, tetraethyl lead (TEL) began to be used commercially as a gasoline additive to increase the efficiency of internal combustion engines used in automobiles and aircraft. Lead prevents engine knock or uneven burning in high compression engines. Gasoline's resistance to engine knock can be increased either by further refining of the gasoline or by adding lead. Most oil companies found that adding lead was cheaper than another refining stage and so lead was added to gasoline.

Even at the outset, public health officials were apprehensive about the wide distribution of the toxic lead compound. After a number of fatal poisonings occurred in the manufacture and mixing of TEL, the sale of leaded gasoline was temporarily discontinued in May 1925, at the suggestion of the U.S. Surgeon General. A committee investigating the use of lead recom-

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mended regulations governing the manufacture and mixing of TEL, the distribution of leaded gasoline, and precautions for automobile garages, repair shops, and filling stations. A year later, in 1926, Ethyl Corporation voluntarily agreed to manufacture, blend, and market TEL and leaded gasoline in accordance with the intent of the recommended regulations. The use of leaded gasoline then began to grow. One familiar result was the warning sign on gasoline pumps still visible today: "This gasoline contains LEAD. To be used as a motor fuel only and not for cleaning or other purposes."

Unfortunately, as a result of Ethyl Corporation's voluntary agreement, the recommended regulations were never promulgated as law.

Today the public health aspects of the lead poisoning problem fall into three categories. The first, and most serious, involves the children of the poor who are likely to be getting lead from both paint chips and the dirt in their environment. The 2,000 lead poisoning cases detected in New York City in 1971 fall into this category. A lead poisoning case, as defined by the city, occurs when a child is found to have more than sixty micrograms of lead per 100 milliliters of blood. What percentage of the lead intake of these children was from paint, and what percentage from air and dirt in the environment, is not known.

Clearly many of these 2,000 cases were caused by the ingestion of lead-based paint. Public health scientists have carefully documented a number of lead poisonings caused by paint chips. And until recently it has been assumed by health officials that virtually all cases of lead poisoning were caused by lead paint. In 1971, however, public health researchers found extremely high lead levels in street dirt, and calculated that a pinch of such dirt orally ingested could cause lead poisoning. The data now indicate that most of the cases of lead poisoning previously attributed to the lead in paint have been caused at least in part by the leaded dirt and dust in the child's environment.

The second public health category includes children of middle and upper income families living along major traffic arteries and freeways. These children are not likely to eat paint chips because they do not live in dilapidated houses, are better fed, and probably are more closely supervised. Upper and middle income children, nevertheless, are likely to eat enough dirt to be in danger of lead poisoning.

Of course not all children eat one twenty-fourth of a teaspoon of dirt every day. The consequences, therefore, may not be readily recognized, nor as clear or as severe as death and mental retardation. The child is likely to appear well, without symptoms of illness.

Scientists are finding it difficult to define the bodily harm which might occur in the gray area of blood lead levels between the normal and poisoning points. Public health researchers are concerned because they

know lead is a toxic substance which attacks the hemoglobin of red blood cells, the kidneys, and the brain. But in the gray area of blood lead levels the damage may be subtle and difficult to detect until many years after the damage is done.

The third public health category includes the general population—not just children, but all individuals carrying an abnormal body burden of lead in the blood, bones, and soft tissues. Surveys show that urban residents carry thirty to sixty per cent more lead in their blood than do rural residents. For adults, lead ingestion results primarily from breathing airborne lead.

Scientists know the least about the effects of lead from long-term dosages at low levels (twenty to forty micrograms of lead per 100 milliliters of blood) on the general urban population. For example, it has been known for some time that the bones act as a reservoir for lead. For lack of scientific data to the contrary, such stored lead was considered, until recently, to be biologically inert or harmless. But as Dr. Laurence Finberg of the American Academy of Pediatrics' Committee on Environmental Hazards has written:

"I am quite sure that the pool of lead in the skeleton is not physiologically inert under all circumstances . . . Since lead does not appear to have any necessary role in life processes, its presence may be looked upon as the biologic equivalent of a loose monkey wrench in the machinery."

The twenty-fourth of a teaspoon calculation for child lead poisoning, made by Environmental Protection Agency scientists, is based on the assumption that sidewalk dirt contains 2,500 parts of lead per million parts of dirt (2,500 ppm lead). In reality, of course, lead concentrations vary from time to time and place to place depending, for example, on the amount of rainfall. Prolonged heavy rainfall has a cleansing effect and reduces the amount of lead in the air and sidewalk dirt. Conversely, long periods without rain would result in higher lead levels in dirt.

An EPA survey of seventy-seven midwestern cities found an average lead level of 2,413 ppm in commercial areas and 1,636 ppm in residential areas. The dirt and dust on the sidewalk in front of the White House recently was found to contain 5,000 ppm lead.

Collecting samples of dust for the Public Interest Campaign (a citizen organization researching the lead poisoning problem), I found an average lead level of 2,497 ppm on the sidewalks of the Bedford-Stuyvesant area of Brooklyn, New York—a neighborhood with a high incidence of lead poisoning. On one sidewalk the level was 4,875 ppm. The sidewalks of New York City were selected for study because New York is the only city which by regulation has sharply reduced the lead content of gasoline sold in the city and has an extensive, well-documented childhood lead poisoning screening program which measures the blood of nearly 100,000 children each year.

Since late 1971, when city regulation began, the amount of lead in the city's air has diminished nearly

50 per cent. The city's regulations prohibit the adding of any lead to gasoline sold in the city. Under the regulations the lead content of gasoline sold within New York City's boundaries since January 1972 has been limited to one gram per gallon. This level is less than half the average 2.5 grams per gallon used in the city prior to the regulations, and found in gasolines in the rest of the nation today.

Will the EPA's regulations protect the public's health? The regulations are in two parts. The first, which went into effect this July, is designed to protect the mufflers on the 1975 cars by requiring half the nation's stations to carry unleaded gas. The second, aimed at health protection, goes into effect January 1, 1975. It provides for a year-by-year reduction—until 1979—in the amount of lead permitted in gasoline. By 1979 the emissions of lead from gasoline are to be reduced, theoretically, by 65 per cent under the EPA regulations.

"Theoretically" is the proper word because the regulations are in continuous jeopardy from Congress, the courts, and the executive branch. The EPA regulations are already being challenged in the courts by oil and lead additive producers who want them weakened. Meanwhile, environmentalists seek to have them strengthened.

The Public Interest Campaign (PIC) has the information to answer this key question: "Will EPA's 65 per cent reduction in lead emissions by 1979 be sufficient to protect the public's health?" We think not.

Based on the facts developed so far, our analyses demonstrate that the planned lead regulation will not achieve its stated objective of protecting the health of the nation's urban children. Though the agency claimed its goal was to prevent the buildup of body lead burdens in substantial segments of the population, calculations by PIC submitted to the EPA as early as April 1972, show that even EPA's proposed sixty-five per cent reductions in gasoline lead levels will not be sufficient to prevent the buildup of body burdens of lead in children living along heavily traveled streets.

PIC calculations assumed that the Agency's regulation would be fully implemented, on schedule, and would actually achieve the sixty-five per cent reduction in emissions, ambient air concentrations, and sidewalk dirt and dust concentrations of lead by 1979. (The abysmal history of most government regulation of large economic interests suggests that this is an overly optimistic assumption.) The calculations further assumed, conservatively, that an inner city child had a zero lead intake from paint chips; was perfectly healthy—i.e., not suffering from sickle cell anemia, malnutrition, or a host of other afflictions which magnify the biological effects of lead; and was not exposed to other air pollutants such as carbon monoxide, nitrogen oxides, or photochemical oxidants—all of which further decrease the body's ability to withstand the toxic effects of lead.

Using these unrealistically conservative assumptions, we calculated how much dirt a child would have to

ATTRACTIVE HAZARD

Children who chew magazine pages—a not uncommon practice—may be receiving a dangerous dose of lead if the printing is in color. The Connecticut Agricultural Experiment Station has traced a high blood lead level in a child with a chewing habit to lead content of colored inks ranging as high as 29,000 parts per million.

"A child ingesting a piece slightly less than two inches square could be receiving a daily dose at a potentially hazardous level," the Station's researchers reported.

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ingest in 1979 to exceed his maximum daily permissible intake level (MDPI). MDPI is a medical term for the level above which a child begins to take in more lead than his body can excrete, and lead accumulation in the body begins. A child exceeding the MDPI level of lead is on his way to lead poisoning. PIC calculations showed that in 1979 even a *healthy* inner city child would have to ingest just one-twentieth of a teaspoon of sidewalk dirt to exceed his MDPI level.

Clearly, the Agency's regulation will not achieve its stated purpose of protecting the public health even by 1979. EPA scientists have not questioned PIC's analyses. In fact, subsequent to our comments in September 1972, EPA medical scientists drafted a detailed summary report on the known health effects of lead and concluded that "EPA's previous lead in gasoline regulation calling for a sixty to sixty-five per cent reduction . . . must be considered inadequate to protect the public health."

In view of this finding by EPA doctors and scientists, and similar comments from the American Academy of Pediatrics and the American Public Health Association, one would have expected EPA to tighten its proposed regulation. Yet, on December 27, 1972, the then EPA Administrator, William D. Ruckelshaus, came up with a "Christmas present" for the nation's children which was tantamount to a decision to "let them eat lead." He announced not a more stringent regulation, but rather a re-proposal of the same inadequate regulation, but this time with even weaker enforcement provisions and a one-year postponement until 1975 for the beginning date of the lead reduction schedule. This was the feeble regulation adopted recently by Russell Train, present EPA Administrator.

Would a truly effective regulation cost the nation more than it can afford to pay? Just the opposite.

Authoritative studies show that *all* lead can be removed from all grades of gasoline over a five-year phased reduction schedule at a cost of less than two cents per gallon of gasoline—or \$15 dollars per year to

the average car owner. This cost to the consumer would be offset by savings each year on reduced costs for sparkplug replacement, less frequent oil and oil filter changes, and increased gas mileage or fuel economy. The net result would be that for less than a penny more per gallon, by 1978 the consumer could be enjoying the benefits of both lead-free gasoline and lead-free lungs. So if economics lies at the base of the EPA's decision, it is not consumer economics.

At the same time that Ruckelshaus was deciding not to prevent lead poisonings by eliminating the environmental lead hazard, the budget for Federal lead poisoning detection and treatment programs was cut to \$7.5 million a year. This sum was so inadequate in 1972 that two states and twenty-eight cities which had applied for Federal lead poisoning treatment funds had to be turned down. Many other cities did not even apply, knowing their funding chances were negligible.

In 1972, across the country, an estimated 200 children died of lead poisoning, 150 children suffered such severe lead poisoning as to require lifetime institutional care, 6,000 were left with neurological handicaps including mental retardation, 80,000 suffered asymptomatic lead poisoning, and another 600,000 suffered from dangerously high blood lead levels. Even now the nation spends nearly \$200 million on the hospitalization, treatment, and institutional care of children stricken by lead poisoning. And this does not include the vast numbers of children who suffer lead poisoning in sickening silence because they are not found and treated.

Thus the American family is already paying heavily for the treatment of lead poisoning. It would make more economic sense, as well as more moral sense, for dollars to be spent on the prevention of lead poisoning than solely on treatment after the damage has been done. It should be noted that the estimates of the number of children afflicted were derived from primarily black inner city populations—from roughly 2.5 million children at risk. Detailed studies have not been made on the population at large because lead poisonings most frequently occur among children in urban poverty. Studies are needed of children living along heavily traveled freeways in suburban areas.

One hope at the local level lies with the preservation of New York City's achievements in lead pollution control. The New York State Department of Conservation is in the process of deciding whether or not New York City's regulation can be preserved by making it a part of the state's air pollution control plan for particulate emissions. A second hope is that New York City and environmental groups might be able to win a legal battle with the Federal Government to preserve the city's regulation, or to force the EPA to adopt a more stringent Federal regulation.

As individual citizens we can guard what our children put into their mouths, use lead-free or low-lead gasoline, and urge government officials to eliminate the lead hazard in dirt and dust as soon as possible. Send them a message: "Get the Lead Out." □

The Wrong End

Our Government has purchased forty-five million pounds of prime beef for distribution in the Federal school lunch program. Starting in September, the children of the poor will lunch on better hamburger than the parents of the middle-class can easily afford in the supermarket.

There is no action rarer in the chronicles of our governors than any gesture of benevolence toward the deprived. But if the deed is a departure, its spirit remains the same. Mr. Nixon comforts the poor only to relieve the temporary distress of the prosperous.

A year ago a cattleman could expect a profit of a hundred dollars a steer. Now the cost of feed is so onerous and the resistance of the consumer to high beef prices so intense that the cattlemen are down to a \$3.50 profit per steer and will need the best of luck to maintain even that. The beef producers, in their desperation, have even been driven to the unthinkable point of concern for the public interest; they have suggested that the retail butchers, since they are paying less for raw beef, charge their customers less for the finished product, and try in that way to increase meat consumption.

But Mr. Nixon has a nature that shrinks from making one special interest sacrifice for the rescue of another. And so, his Department of Agriculture has decided to help the cattlemen by buying their beef and serving it as free luxury hamburger on the school lunch program.

And Mr. Nixon has always disliked the school lunch program as just one more symbol of our Government's fancied indulgence of the poor. Two years ago, his efforts to cut its budget were overcome only by the resistance of a few Senators, most of them, of course, from the agricultural states, and more concerned for the comforts of the farmer than with the malnutrition of the urban poor.

But now, all of a sudden, Mr. Nixon moves to make the school lunch program more abounding than ever—not to help the children but to appease the cattlemen without affronting the grocerymen. We can only, of course, be glad that a child whose mother cannot afford to feed him enough of anything better than fatback at home may at last have the transient chance to eat prime hamburger at school. But could we not have thought of the needs of that child before we were confronted by the financial problems of the beef industry? No. Of course we couldn't; the wrong end of the stick is the only one our Government ever picks up.

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