The exposure of American children to damaging quantities of the toxic metal, lead, has reached terrible epidemic proportions. An examination of this scourge may give us insight into other environmental problems.

Our facts are taken from three government studies. One we'll call NEHANES 2 (short for Second National Health and Nutrition Examination Survey); the others we'll call ATSDR 1 and ATSDR 2 (short for two studies published by the Agency for Toxic Substances and Disease Registry--a federal agency). Full citations to all three studies appear in our last paragraph, below.

Lead is a naturally-occurring element, a soft, bluish-gray metal that occurs in the ground and is naturally toxic. At some locations, lead occurs in such high concentrations that it can be readily mined. Because it occurs naturally, it is found everywhere in low levels--in rocks, in soil, in plants, in animals, and in humans. Before lead came into industrial use, human blood contained approximately 0.5 micrograms of lead in each tenth of a liter [deciliter] of blood (expressed in scientific shorthand as 0.5 micrograms per deciliter). A microgram is a millionth of a gram and there are 28 grams in an ounce; a liter is about a quart; a deciliter is a tenth of a liter, or about half a cup. Therefore we say that the "natural background" of lead in human blood is 0.5 micrograms per deciliter (ATSDR 1, pg. 16). Whenever such data are available, a natural background level is a good benchmark against which to measure the size of a problem. As a rule of thumb, a 10% increase above background should raise eyebrows and questions; a doubling of a background level is significant; a tenfold increase above background is very large.

According to the best available data (NEHANES 2, pg. 26), the average (mean) concentration of lead in the blood of American children ages 6 months to 5 years is 16 micrograms per deciliter; thus American children have 30 times as much lead in their blood as humans have naturally. A 30-fold increase above background is a very large increase--indeed; we should expect to see adverse effects from such a rise.

When do effects start to occur?

As with any characteristic (such as height or weight), blood in lead varies from individual to individual. When the average is 16, some children have 3 micrograms per deciliter and some have 30 or more. An important medical question is: at what point do adverse effects become observable?

The answer, for the human fetus exposed while in the womb, is: reductions in gestational age (length of pregnancy), birth weight, birth height, girth of chest, and circumference of head are observable in children who have 10 micrograms per deciliter and in some cases even less (ATSDR 1, pgs. IV-17 through IV-19; ATSDR 2 pg. 23). For these growth-related effects, there is no observable "threshold"--no amount of lead below which there are no observable effects. This indicates that the only "safe" amount of lead in blood is natural background. (Even natural background may not be entirely safe, but it's surely the best we could expect to achieve as an average.)

At 10 micrograms per deciliter and even lower levels of lead in blood, other adverse medical effects are observable in American children under 5 years old: cognitive ability (as measured on standard tests, including the Stanford Binet IQ test) is impaired at blood-levels below 10 micrograms per deciliter. And children's hearing is impaired by blood-lead levels below 10 micrograms per deciliter; it is worth pointing out that hearing impairment can make learning disabilities worse. (ATSDR 2, pg. 21)

Children ages 6 to 24 months with blood-lead of 10 micrograms per deciliter and higher score 4.8 points lower (out of 100), measured on a standardized test called Bayley Mental Development Index (MDI), compared to children with 3 micrograms per deciliter or less. (ATSDR 1, pgs. IV-7 through IV-19; ATSDR 2, pg. 24.)

There is now considerable evidence that such retardation in normal physical and mental development is not reversed as time passes. The effects are evidently irreversible. (ATSDR 1, pg. IV-11.)

Thus there seems to be little doubt that lead in children's blood at 10 micrograms per deciliter or even less retards physical, mental, and perhaps emotional development; these effects are permanent.

How many American children have blood lead levels of 10 micrograms per deciliter or higher? Answer: an astonishing 88%. (NEHANES 2, Table 4, pg. 26, shows that among American children 5 years old or younger, 63.3% have between 10 and 19 micrograms per deciliter; 20.5% have 20 to 29 micrograms per deciliter; 3.5% have 30 to 39 micrograms per deciliter; and 0.5% have 40 or more.) We have poisoned our children.

It is therefore proper to ask what happens to a nation that poisons its children? The federal Agency for Toxic Substances and Disease Registry (ATSDR) has asked and answered this question: "Lead-induced reductions in IQ, for instance, not only place the individual at a disadvantage, but also eventually place the nation at a collective disadvantage in an increasingly competitive, technical, and cognitivelyintensive world economy." (ATSDR 1, pg. IV-1.)

What can be done? ATSDR says, "At the same time that progress is being made to reduce some sources of lead toxicity, scientific determinations of what constitute 'safe' levels of lead exposure are concurrently declining even further. Thus increasing percentages of young children and pregnant women fall into the 'at-risk' category as permissible exposure limits are revised downward. Accompanying these increases is the growing dilemma of how to deal effectively with such a widespread public health problem. Since hospitalization and medical treatment of individuals with blood-lead levels below approximately 25 micrograms per deciliter is neither appropriate nor even feasible, the only available option is to eliminate or reduce the lead in the environment." (ATSDR 1, pgs. 16-17)

It is clear that removing lead from the American environment should be a matter of highest priority. Our national security depends upon it more than it depends upon military buildup or showdowns. Furthermore we must have a policy of zero discharge.

ATSDR points out that the easy steps have already been taken to reduce lead in the environment. Lead has been restricted in paint, and in gasoline. Lead in food and in drinking water has already been subjected to regulation (though not yet to effective enforcement). "Lead in old paint, dust, and soil, however, is pervasive and dispersed, and fundamentally different approaches to abatement will be needed. If the Nation is to solve these difficult facets of the lead problem, society must make a strong effort to do so." (ATSDR 1, pg. 17, emphasis added.)

But the nation cannot make a strong effort without a coordinated plan--and that requires leadership. It is long past time for the environmental community to press George Bush, our self-proclaimed "education" and "environmentalist" President, to force him to acknowledge that the poisoning of our children is a national scandal, an intolerable disgrace. Then we must force him to act to make America once again safe for its children. Let us resolve to work together in '91 to make real change happen.

Get: NEHANES 2: "Blood Lead Levels for Persons Ages 6 Months-74 Years, United States, 1976-80.... Data From the National Health and Nutrition Examination Survey," VITAL AND HEALTH STATISTICS Series 11, No. 233 [DHHS Publication No. (PHS) 84-1683; U.S. Department of Health and Human Services, Public Health Service, National Center for Health Statistics, Hyattsville, MD], August, 1984. Available from your local library via interlibrary loan from any federal depository library; every state has...
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--Peter Montague

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