People concerned about landfills and about ‘mass burn’ incinerators need to pay close attention to the toxic metal, lead. Many new studies show it is more toxic, especially to children, than previously thought.

Lead is one of the 92 chemical elements that form the basic building blocks for the whole universe; it happens to be very toxic. Because it is an element, lead never breaks down or biodegrades or goes away. Since ancient times, people have found lead useful because it is a soft metal that can be easily mined from ore in the ground, then shaped into pipes, pots, tanks, and other useful items. Ancient Egyptians used it for glazing pottery 7,000 years ago. Even in ancient times, its toxicity was recognized--but not recognized well enough. There is evidence from the exhumed bones of Romans that the Roman upper classes exterminated themselves by eating and drinking with lead utensils. They ingested so much lead that they became sterile and couldn't reproduce themselves. Roman leaders may have also lost their mental quickness because one of the effects of lead is to damage the central nervous system, reducing one's IQ.

Like so many other toxic chemicals, lead has been adopted into the American economy on a massive scale without anyone paying attention. We use about 1.5 million tons of lead each year (roughly 40% of it recycled from scrap, the rest newly mined). A rough calculation tells us that we throw away (do not recycle) about 9 pounds of lead per person per year in America. We now find lead everywhere throughout the economy—in plastic items to stiffen them, in metal alloys, in gasoline, in solder, in cable sheathing, and, of course, in storage batteries. Automobiles account for more than half of all lead "consumed" each year—though none of it is really consumed. It is mined out of the deep earth, used for a time, then thrown into a shallow pit (a landfill) or burned and injected into the air. When it is incinerated, lead partly goes up the stack and partly remains in the ash (the dividing line depending on the temperature of combustion). A 712-ton-per day "mass burn" garbage incinerator in New Jersey is expected to spew 148 pounds of lead per day from its stack. We don't have American figures, but Norwegian municipal incinerator ash contains 11.4 pounds of lead in each ton of ash (the ash contains 5,700 ppm lead).

After lead becomes airborne from a smoke stack, it begins to fall out onto the surface of the earth. Along the way, people may breathe it. After it falls to earth, it can be taken up by plants (including food crops), or rain can move it toward the nearest body of water, where part of it will be taken up by living things, including plants, insects, birds and fish. Much of it will eventually make its way toward the ocean, where it can be taken up by shellfish and fin fish. In this way, some of it will be recycled into humans. For most people, food is our greatest source of lead today.

Lead is a poison that attacks many parts of the human body because it interferes with enzyme activity. Much of the body's chemistry is dependent on enzymes that make certain chemical reactions possible; thus an enzyme poison can have many far-reaching effects. Lead especially attacks the liver, the kidneys, the gastrointestinal system, and the central nervous system (the brain, the senses, and the nerves that carry signals throughout the body).

Because they are growing, children are affected more than adults by lead. The federal Centers for Disease Control (CDC) in 1985 reduced the recommended lead level in children's blood from 30 micrograms per deciliter (ug/dl) to 25 ug/dl. [A deciliter is a 10th of a liter; a microgram is a millionth of a gram and there are 28 grams in an ounce.] Now experts within the federal Environmental Protection Agency (EPA), and a panel of outside experts advising the EPA, want this standard dropped further—perhaps by as much as 60% (down to 10 ug/dl). If the standard were changed from 25 to 10, the number of U.S. children defined as carrying excessive amounts of lead would rise from 25% of all children to 88% of all children. The 10 ug/dl standard would also mean that 77% of all U.S. adults carry excessive lead in their systems now.

The EPA's Clean Air Science Advisory Committee has recommended that this change in standards be made. Their suggestion is prompted by a rash of new studies that show harmful effects at lead levels currently defined as acceptable: blood pressure in men increases as blood lead levels rise from 10 to 20 ug/dl; the height of children is directly related to blood-lead levels (even levels as low as 7 ug/dl result in below-normal height); and reduced IQ in children is linked to blood-lead levels under 20 ug/dl.

The May 30 issue of the British medical journal, LANCET, reports a study of 501 children in Scotland, revealing a 6% reduction of cognitive ability and learning skills among 6 to 9 year olds with average blood lead levels of only 10.4 ug/dl. More than 80% of American children already have blood lead levels as high as this. These are "subclinical effects" of lead poisoning: there are no outward signs that the children are affected, yet the tests are "important confirmation" that lead is neurotoxic to children at levels previously thought safe, says Dr. Herbert Needleman at Children's Hospital in Pittsburgh.

David A. Otto, a researcher at EPA's Health Effects Laboratory in Research Triangle Park, NC, recently reported a study of 3000 children, revealing hearing impairment among children with as little as 12 ug/dl lead in blood. He says the small impairment in hearing may contribute to learning disabilities, and even to speech impairment, among affected children. Previous studies of adult workers have revealed hearing impairment when blood lead reached 50 ug/dl.

The message for parents seems to be this: there's already enough lead in the American environment to damage a lot of children. No increase in environmental lead is desirable or acceptable. Ultimately, the use of lead in the American economy must be cut back. Until then, facilities like mass burn incinerators, which promise to increase the lead exposure of the general public immediately, must be stopped.

For further information about lead toxicity contact Dr. Ellen Silbergeld, Environmental Defense Fund, 1616 P Street, NW, Washington, DC 20036; (202) 387-3500.

--Peter Montague

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