

# CHAPTER 1

## Lead and the Roots of Environmental Controversies

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In 2007 the popular toy, Thomas the Train, was recalled by its manufacturer because of a lead paint hazard. What are the hazards of lead for children? This has been studied extensively in the last 30 years. Exposure to lead lowers children's IQ test scores and raises the likelihood of restless and inattentive behavior, diagnosis with attention deficit hyperactivity disorder (ADHD), and juvenile delinquency. Lead exposure in the United States has dropped dramatically since lead was phased out of paint and gasoline. But lead exposure is still a problem for young children.

Shortly after one of my friends had a baby, his in-laws visited. The in-laws spent two weeks helping the new parents fix up the house, which was built in the 1920s. They painted the baby room, the stairs, and the living room. When the in-laws sanded the woodwork to remove the old paint, lead dust permeated the air. When the infant's pediatrician tested the child's blood lead, it was almost double the current cutoff for high lead (10  $\mu\text{g}/\text{dl}$ ). The infant had absorbed lead by breathing it from the air. This scenario shows that environmental policy decisions have long-term repercussions for public health. Let's look at the history of lead to see why an infant could be lead poisoned in 2008 by paint dust from home renovations.

The history of lead in the United States brings us face to face with this question: what decision standard do we use to regulate a new technology that has uncertain risks and benefits? Lead also provides a striking example of how scientists clash over environmental issues, with experts on opposite sides drawing different conclusions. A major part of the scientific conflict is rooted in the decision standards and assumptions on which the research is based. Those decision standards and assumptions involve implicit value judgments that affect the conclusions. In turn, the conclusions scientists draw ultimately affect the pollution prevention and cleanup decisions of our governments.

Lead also tells a tale of grave social injustice: African American children in low-income families in the United States have the highest exposure to lead of any segment of the American population. But scientists argue about whether lead exposure is a cause of lower IQ test scores or behavior problems or whether it just appears that lead exposure has negative effects on children because lead exposure is higher in socially disadvantaged circumstances. The conclusions a researcher draws about whether lead causes problems in children depend critically on the scientist's assumptions about IQ test scores and what influences them. So, en route to learning about how lead affects children's development, this chapter also involves decision standards in science and shows how unquestioned, status quo viewpoints within science influence scientists' interpretations of their research results in very important ways.

## A Brief History of Lead Exposure and Regulation in the United States

*Alice Hamilton, MD, Social Reformer*

Lead has been known to be poisonous since the Roman period, when Pliny the Elder wrote about it. But factory workers after the industrial revolution were exposed to higher levels of lead in greater numbers than before. Alice Hamilton, MD, was an early crusader in the battles for worker safety. Figure 1.1 shows the postage stamp issued in her honor. Among her other accomplishments, she was the first woman to be a professor at Harvard



FIGURE 1-1. Postage stamp honoring Dr. Alice Hamilton.