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Warnings Unheeded: A History of Child Lead Poisoning

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Abstract: Child lead poisoning has been a major public health issue only for the last 20–25 years. However, awareness that lead-based paint is a source of lead poisoning in children dates back to the first few years of the twentieth century. Articles in medical journals and textbooks appeared in the United States and elsewhere, recounting cases of children poisoned by the lead paint in their homes on woodwork, baby cribs, and other furniture. The number of positively diagnosed cases was limited both by the imprecision of diagnostic tools and physicians' lack of familiarity with the signs and

symptoms of plumbism in children. Nevertheless, a number of hospitals and at least one large city health department recorded numerous cases of child lead poisoning in the 1920s and 1930s.

The mounting evidence in those years made it clear that child lead poisoning was a serious public health hazard. And the activities and statements of the lead industry's representatives left little doubt that they were aware of the dangers of lead paint. Nevertheless, the lead paint companies continued to manufacture and sell their product well past 1940. (*Am J Public Health* 1989; 79:1668–1674.)

Introduction

Child lead poisoning became a public issue of national concern over 20 years ago. Reports were quite common in the 1960s and 1970s of severe poisonings resulting in convulsions, coma, mental retardation, and even death. Even today, hundreds of thousands of young children suffer from lead levels that result in learning disabilities, hyperactivity, poor motor coordination, and other developmental deficits. It is well known that the major source of such poisonings is the lead paint applied to homes 40, 50, and 100 years ago. And because as many as 25–30 million dwellings in the United States are estimated to have lead paint, it is not a problem that will be easily remedied.¹

Given the continuing toll taken by child lead poisoning and the considerable resources that will be required to deal with the problem, it may be useful to consider some related historical questions: 1) to what extent did children suffer from plumbism in the early years of this century; 2) if cases of this disease were a common occurrence, to what extent were they reported in the scientific literature; and 3) at what point were the warnings of the medical profession heeded and lead paint removed from the market? This paper will attempt to provide some tentative answers.

The Medical Literature and Public Knowledge, 1904–39

As early as 1904, Dr. Lockhart Gibson, a physician in Queensland, Australia, concluded that lead paint in the home was responsible for lead poisoning in children. He suggested that two conditions of lead-painted surfaces would be likely to induce the disease: 1) freshly painted or sticky surfaces, and 2) surfaces that are well worn and powdery. In the latter

case, lead-contaminated dust could spread throughout the rooms of a dwelling. The greater danger, however,

is adhesion of the paint either by nature of its stickiness or by nature of its powdery character, and fingers and nails by which it is carried to the mouths of children, especially in the case of those who bite their nails, suck their fingers, or eat with unwashed hands.²

Other articles followed in Australia over the next several years confirming Dr. Gibson's finding that lead paint was responsible for child lead poisoning. One of the first published accounts of a case of child lead poisoning in the United States came in 1914.³ The authors, after a review of the pediatric literature, concluded that lead poisoning was not very common. Three years later, however, Kenneth Blackfan, a physician at Johns Hopkins Hospital and a professor at the Johns Hopkins Medical School, suggested that, "In all patients with convulsions in which the etiological factor is not clear, lead should be suspected."⁴ The author here expresses a theme that is to be repeated many times over the next 30 to 40 years: the more doctors look for lead intoxication, the more they find it.

Through the early 1920s, doctors published reports of individual or small groups of cases. For example, in their medical textbook, *The Diseases of Infancy and Childhood*, Holt and Howland say that,

An infrequent cause of convulsions in young children is an encephalopathy due to lead poisoning. We have seen eight such cases, six of which were fatal. The poisoning was caused in each instance by the child's nibbling and swallowing the paint from his crib or furniture.⁵

Beginning in the mid-1920s, child lead poisoning seemed to gain wider recognition as a common childhood disease resulting from lead paint in the home. Ruddock concluded that, "There are many mild cases of lead poisoning in children, manifested by spasms or colic, the true nature of which are never suspected."⁶ He identified window sills,

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porch railings and crib railings as major sources of lead paint. In other words, "A child lives in a lead world."⁶ Another author included toys, furniture, porch railings, and window sills as likely sources.⁷ He also concluded that many cases of child lead poisoning went undiagnosed. Charles McKhann, one of the leading physicians in the study of lead poisoning, stated flatly in 1926 that, "Lead poisoning is of relatively frequent occurrence in children."⁸

Jane Lin-Fu, a recognized authority on child lead poisoning, sums up the knowledge of this period, "By the early 1920s . . . severe forms of childhood lead poisoning were recognized, and it became obvious that the illness was quite common in the United States."⁹ The US Department of Health and Human Services agrees. A "Joint Statement: Lead Poisoning in Children" by the Department's Bureau of Community Health Services and Centers for Disease Control stated, "Lead poisoning in children from paint was recognized early in this century."¹⁰

Many articles, mostly case studies, followed in the 1930s, identifying lead-based paint in the home as the source of child lead poisoning.¹¹⁻²⁶ Several of these articles also noted that many cases of plumbism went undiagnosed by doctors unfamiliar with the specific signs and symptoms of the disease.^{13-15,17,21,22,24-26} One difficulty was that many of the symptoms of lead poisoning are common to other childhood diseases, e.g., vomiting, abdominal pain, constipation, and irritability. In the more severe cases, lead poisoning could be confused with meningitis or various forms of encephalitis.²¹ Bucy and Buchanan¹³ reported on lead poisoning cases originally diagnosed as "intracranial tumors." In addition, the lack of precise diagnostic tools in the early years of the century made the identification of child lead poisoning difficult. Blood lead testing did not become widely available until after 1940. The use of bone X-rays to reveal excessive lead absorption was first suggested in 1930. In a discussion of the use of X-rays to diagnose child lead poisoning one doctor commented,

It is a striking example . . . of the adage that one sees what one looks for. Physicians have not been looking for lead poisoning with any vigorous search. Now that they are suspecting it, they are finding three or four times as much lead poisoning as they found before. The ease of diagnosis of any condition is bound to affect the prevalence of the percentage of diagnosis of that condition.²⁶

Perhaps the occurrence of child lead poisoning and the frequent failure to diagnose it is best summed up in a 1930 report of the Metropolitan Life Insurance Company. Metropolitan had contacted several pediatricians inquiring about the prevalence and causes of child lead poisoning. In part the report concludes:

Chronic lead poisoning occurs much more frequently among infants and young children than has been generally supposed. It would be a more prominent item in both morbidity and mortality records but for the fact that the condition is often unrecognized by physicians. . . . The most informing reply to the Company's letter was that of a Boston physician who stated that fifty cases of lead poisoning in children had been seen in a single Boston hospital during the last six years . . . and that the lead had been ingested, for the most part, as the result of chewing paint from cribs, woodwork or toys. . . . A majority of the pediatricians agreed that chronic lead poisoning in infancy and childhood is by no means a rare condition. . . .²⁷

The evidence that plumbism among young children was indeed a frequent occurrence extended well beyond the

impressions of individual pediatricians. While no comprehensive data collection system existed for child lead poisoning, and while this disease often went undiagnosed, some hospitals and at least one city did keep such records. In Boston the Infants' and Children's Hospital recorded 89 cases between 1924 and 1933.¹⁹ Montreal's Children's Memorial Hospital reported 17 cases, of whom two died, in 1932.¹⁴ The Hospital for Sick Children in Toronto reported 23 cases of child lead poisoning, including five deaths, in a two-year period in the early 1930s.²⁴ Between 1931 and 1940, the Baltimore Health Department recorded 135 cases of child plumbism, including 49 deaths.²⁸

Because plumbism from lead paint was so common, some of those physicians who published accounts of their cases urged the banning of lead paint in homes. In Australia an early observer of the lead problem put the matter simply: "Prevention is easy." Don't use lead paint where children play. He went on to call for "legislative interference."²⁹ In 1920 this call was taken up by the medical association in Australia. The association proposed the prohibition in the state of Queensland of, "the use of lead paint on verandah railings and outside surfaces within reach of children's fingers."³⁰ This was heeded, and in 1922 legislation to this effect was passed. At the annual meeting of the American College of Physicians in 1933 one speaker, after explaining the grave danger of lead paint and the need for preventive measures, noted that,

Many countries in different parts of the world prohibit the use of lead in indoor paints and paints for toys, etc., but I am not aware of any such laws in any country or state in North America.¹⁴

Parenthetically, it should be noted that at the above cited medical meeting an entire symposium on "Lead Poisoning in Children" was presented. Other topics covered at the symposium included: "Roentgenray Observations," "Chemistry of Lead," "Pathology," and "Treatment."

After reviewing the more common causes of childhood poisonings in the US and Canada, the authors of one article offered the opinion that lead poisoning was "the most common single cause of poisoning in children."²⁴ They went on to discuss the sources of lead poisoning including, of course, lead paint. They concluded that,

In view of the above considerations it would seem advisable to prohibit the use of lead-containing paints for toys, children's furniture and for interior work.²⁴

To a limited degree, governments and public agencies did take an interest in preventing plumbism among young children. As noted above, in 1922 the state of Queensland in Australia banned the use of lead paint for certain dwelling surfaces. The Baltimore City Health Department began its formal interest in child lead poisoning in 1931. In that year it investigated the deaths of two children, ages two and three years, from lead paint. The following year such investigations became a routine part of the department's activities. And in 1935 the health department established a free blood lead laboratory service for physicians and hospitals.³¹ Several other countries acknowledged the dangers of lead paint to children in an occupational setting during the 1920s and 1930s. Among the countries that either banned the use of lead paint indoors or severely restricted children's contact with it were Great Britain (1926), Spain (1931), Tunisia (1922), Sweden (1926), Belgium (1926), Cuba (1934), Yugoslavia (1931), Poland (1927), and Greece (1922).³²



FIGURE 1—Advertisement featuring the Dutch Boy trademark on a can of white-lead paint which emphasized the durability of the product.
SOURCE: *Oil, Paint and Drug Reporter* magazine, December 6, 1937.

While the publication of numerous articles in medical journals and textbooks and the establishment of a lead poisoning public health program in a major city are strong evidence that child lead poisoning was far from a rare occurrence, there are also clear indications that the industry itself was well aware of the problem. Robert Kehoe, from the mid-1920s to the 1960s, was one of the nation's better known and respected scientific authorities on lead poisoning.³³ He was also closely associated with the lead industry. In 1930, he became the first director of the Kettering Laboratory of Applied Physiology, which was partly funded by the Lead Industries Association (LIA). In 1925 he was appointed the medical director of the Ethyl Gasoline Corporation (the producer of the gasoline lead additive). For 40 years, Kehoe conducted research and attended conferences supported by the LIA and other lead-related organizations. And yet, while he framed his research and conclusions in a manner that minimized the dangers of lead to the worker, he did no such thing in discussing *child* lead poisoning. In discussing a paper presented at the 84th Annual Session of the American Medical Association in 1933, he emphasized the greater danger to children:

It is of particular interest and importance that in children with lead poisoning there is a striking tendency for symptoms of the central nervous system to develop, indicating the fundamental difference in the disease in children and adults. Encephalitis in children, as in adults, has a bad prognosis. From available figures one concludes that the prognosis in children and the outlook for complete recovery are even somewhat worse than in adults. . . . strenuous efforts must be devoted to eliminating lead from their environment.¹⁹

In a paper of his own, Kehoe states that in adults the "intensity" of exposure, as well as the clinical picture, must be studied before arriving at a diagnosis of lead poisoning. But for children he explicitly rejects that line of reasoning:

There is at least one type of potential lead exposure to which the above reservations should not apply in practice, despite their validity in principle. There is every reason for suspecting the existence of significant and dangerous lead exposure in the case of children with a history of pica. The occurrence of lead-containing commodities and the use of lead paints on furniture, toys, and other objects within the reach of small children is much too common to ignore. The existence of symptoms even slightly suggestive of plumbism should result in prompt investigation of the child and his surroundings.³⁴

Other scientists and physicians with close ties to the lead and paint industries were aware of the dangers of lead paint to young children. At a symposium on lead poisoning sponsored by the American Medical Association in 1934, A. J. Lanza, Assistant Medical Director of the Metropolitan Life Insurance Company, read a paper in which he noted the occurrence of child lead poisoning in the US and Australia.³⁵ Present at that symposium were a number of figures closely associated with the lead industry: Kehoe, Frederick Thaman, Jacob Choiak, and Joseph Aub. Thaman and Choiak collaborated extensively with Kehoe on lead research. Choiak was an employee of the Kettering Laboratory and co-authored with Kehoe the *Air Pollution Abatement Manual* for the Manufacturing Chemists Association. Aub, a researcher at Harvard University for many years, received considerable support from the Lead Industries Association and its predecessor, the Lead Institute.

The lead industry itself showed, as early as 1930, its awareness that lead paint was a danger to young children. In

November of that year, the Lead Industries Association sent out a questionnaire to the manufacturers of children's toys and furniture, asking if they applied lead paint to their products. Apparently, by that time few toy and crib manufacturers still used lead paint. As two physicians who communicated personally with the LIA secretary concluded,

The lead industry and the manufacturers of cribs and toys, informed of the danger to small children from the ingestion of lead paint, have cooperated by substituting other types of pigments for the lead pigments formerly used. New cribs are seldom painted with lead paint, and the better grades of toys are largely free from lead pigment. Painted woodwork and painted furniture continue to present sources of lead available to the child.¹⁹

Industry Response

While the lead industry paid considerable attention to the effects of lead on workers, until the 1940s the industry appears to have either ignored or suppressed information pointing to the dangers of lead paint to young children. A 1939 publication estimated that up to that point about 4,000 articles and books had been published on occupational lead poisoning.¹⁶ Another publication on the subject listed approximately 700 references published between the late 1800s and the early 1940s.³⁶ On the other hand, while the number of studies published between 1904 and 1940 on lead paint poisoning in children (at least 35) was more than sufficient to establish lead paint as a significant hazard, clearly the focus was on occupational poisonings. Child lead poisoning was not a focus of attention in the press, and perhaps the industry saw no need to actively defend itself. Kehoe, the industry's chief scientific spokesperson, published little that had to do directly with lead paint poisoning in children. His one study that dealt exclusively with children was concerned only with "normal" levels, and almost all of the subjects were over 5 years old (the upper age limit of "high risk" children).³⁷ Virtually no treatment of the subject appears in either *Lead*, the Lead Industries Association journal, or *Oil, Paint and Drug Reporter*, a trade publication of the paint and chemical industry.

By the 1940s, the lead industry began to take a more active, public posture in denying the significance of the problem of child lead paint poisoning. One method of minimizing the problem was to discredit reports and studies that dealt with the problem. The Secretary of the LIA, at a conference on lead poisoning of the Seventh Annual Congress on Industrial Health, gave a speech that was later published in *Occupational Medicine*.³⁸ The theme of the talk was the LIA's view that reports of child lead poisoning are almost invariably mistaken. By giving a few examples of seemingly absurd claims of lead poisoning, the author leaves the impression that virtually no reports of poisoning can be taken seriously. In criticizing one particular study, he further attacked the validity of bone X-rays as a diagnostic tool—a tool that had long been accepted by the medical community.^{19,26,39,40} and is still in use to some extent. In the criticized study, bone X-rays had been used in the diagnosis of children who had survived severe lead poisoning episodes, but who had no immediate, obvious sequelae.⁴¹ However, the study revealed that almost all of the children had subsequent major difficulties in school.

Another way of downplaying the lead poisoning problem was simply to assert that very few children were being poisoned. Philip Drinker, chairperson of the Industrial Hygiene Department at the Harvard University School of Public

Health, who served on the board of trustees of the Industrial Health Foundation, a corporate-dominated research organization, also attended the Congress on Industrial Health. Drinker stated that child lead paint poisoning was "becoming rare" because toys and furniture were no longer painted with lead-based paint.⁴² He did not support his assertion with any data on the incidence of child lead poisoning. The statement also ignored the role of lead paint on interior woodwork and, curiously, implied that the disease was indeed common in earlier years. Felix Wormser, the LIA Secretary, also stated that child lead poisoning was an uncommon occurrence, again without supporting evidence.³⁸ The LIA publication, *Lead in Modern Industry*, essentially repeated Drinker's unsubstantiated claims, although it conceded that exterior paint on porches might be a hazard.⁴³

A third strategy involved outright intimidation. With his landmark article nearly complete,⁴¹ Randolph Byers received a visit from an LIA official. According to Byers, the LIA threatened to sue him for saying that "lead paint was bad to eat." As a result of the meeting, Byers did make some minor changes, and the LIA did not sue.*

The Public Health Response

Given that child lead poisoning was a significant public health problem in the 1920s and 1930s, one might ask what was the response of the public health community. Apparently, the response was minimal. Other than Baltimore, no major city in the US seems to have had a program to address the problem. And while numerous case study reports appeared in medical journals such as the *Journal of the American Medical Association* and the *American Journal of Diseases of Children*, publications with a public health viewpoint, such as the *American Journal of Public Health*, published virtually no articles on the subject. With such little attention paid to the issue, it is not surprising that virtually no state had banned the use of lead paint for residential use.

An explanation for the lack of attention to this disease may be found in the direction that public health in general was taking during this era. It has been pointed out that in the first couple of decades of the century the focus of public health shifted from the environment to the individual.⁴⁴ In a position that eventually gained widespread acceptance, Charles Chapin, the Providence, Rhode Island health commissioner, took the position that infected people, not environmental conditions, were the most important source of infectious diseases: "... with minor exception, municipal cleanliness does little to prevent infection or decrease the death rate. Municipal cleanliness is no panacea. It will make no demonstrable difference in a city's mortality whether its streets are clean or not, whether the garbage is removed promptly or allowed to accumulate, or whether it has a plumbing law."⁴⁵

Given such an emphasis on the individual, it is not hard to see why the public health community paid such scant attention to lead paint poisoning in children. Rather than call for an end to the sale of lead paint for residential use, medical and public health figures could focus their attention on individuals and families. Almost universally, physicians who commented on the causes of their young patients' poisonings blamed the behavior called pica, a tendency to eat non-food items.^{5-8,20,26} Some placed responsibility on parents' poor

supervision⁸; others emphasized the need to educate parents on the causes of lead poisoning.^{7,19,27}

As was already noted, there were some calls for public action. However, such urging did not come from public health figures, but rather from the physicians who treated case after case of child lead poisoning.

Continued Lead Paint Use

Since the lead and paint industry had considerable evidence in the 1920s and 1930s that their product posed a significant hazard to young children, the question arises: when did these companies stop selling lead paint for residential use? The paint industry has claimed that interior lead paints were discontinued altogether by 1940. In testimony before the Senate Subcommittee on Health (of the Labor and Public Welfare Committee), in hearings on the Lead Paint Poisoning Prevention Act (1970), the General Counsel of the National Paint, Varnish and Lacquer Association stated that, "This type of paint has not been used on interior surfaces for more than thirty (30) years."⁴⁶ *The Wall Street Journal* made the same claim in reporting on the lead poisoning problem.⁴⁷ The evidence, however, tells a different story.

By the 1940s, other pigments certainly had replaced lead paint to a fair degree, but not by any means completely. As the *Science Newsletter* noted in 1946, "... titanium dioxide, as a pigment, is replacing lead in part."⁴⁸ (Emphasis added.) The US Consumer Product Safety Commission, in its study of the lead paint problem reported that, "... about 1940 white lead began to give way to titanium dioxide and zinc oxide."⁴⁹

If indeed the paint manufacturers had ceased production of interior lead paints by 1940, one would also expect them to have taken little interest in research to improve such paints. Yet the January 1940 issue of *Scientific American* magazine reports an improvement in the light-reflective quality of lead paint, resulting in a savings in the amount of artificial light required in homes and offices.⁵⁰

A further indication that the use of lead paint for interiors was still substantial in 1940 comes from its mention in some authoritative technical publications. One such book is *Protective and Decorative Coatings*, edited by Joseph Mattiello,⁵¹ a well-known expert in the paint industry. While giving much more attention to white lead as a pigment for exterior paints, the text also notes its contemporary use in interior paints.

Another text is the *Paint Manual, with Particular Reference to Federal Specifications*, published in 1945 by the US Department of Commerce.⁵² As noted in the "General Comments" section of the book, federal specifications were prepared by committees with members from government agencies and from the paint manufacturers. The specifications were circulated to manufacturers for their comments. The *Manual* itself, "... explains recent developments in the field of painting and includes pertinent references. Descriptions of approximately 60 paints and paint products are included to enable the painter to choose the most suitable materials for the surface to be covered."⁵² It is not, then, unreasonable—when one reads in the *Manual* the federal specifications and mixing directions for lead paint for interior woodwork, plaster, and wall board—to assume that interior lead paint was still in common use in 1945.

Of course, the most convincing evidence that lead paint continued to be used inside homes after 1940 is the actual presence of such paint in dwellings built after that year. A

*Randolph Byers, personal communication, August 30, 1986.

number of studies have documented just that. In a study commissioned by the US Department of Housing and Urban Development, two researchers looked at the distribution of interior lead paint in housing in Pittsburgh.⁵³ The decline in the use of lead paint was quite marked from before 1940 to the 1940-59 period. Nevertheless, about one-third of the city's dwelling units built in the latter period had surfaces with high (2 mg/cm² or more) concentrations of lead, and nearly 10 percent of the rooms tested had such lead levels. The corresponding pre-1940 percentages were 62 percent and 21 percent. A smaller study completed in Washington, DC yielded very similar results.⁵⁴

Recently, Abt Associates completed a national survey of public housing for the US Department of Housing and Urban Development.⁵⁵ They found that among pre-1951 units, 44.4 percent had interior surfaces measuring 2.0 mg/cm² or higher; the corresponding percentage for 1951-59 housing was 28.1. Even housing built between 1960 and 1972 was not lead-free; 8.7 percent had surfaces with high amounts of lead paint.

Some overall national estimates have also been made. A 1972 report by the National Bureau of Standards⁵⁶ estimated that about one-half of the housing units built between 1940 and 1949 in urbanized areas contain lead paint. Another NBS study⁵⁷ estimated that in 1947, of all residential interiors that were painted, over one-third were painted with lead paint.

Incredibly, as late as 1971, there is evidence that significant amounts of lead paint were being sold for residential interior use. In that year, New York City's Health Department tested 76 different paints, and found eight of them with amounts of lead ranging from 2.6 to 10.8 percent.⁵⁸ Although there were no federal laws at that time limiting the level of lead in interior paints, several municipalities, including New York, had established a legal limit of 1 percent. The industry itself had set a voluntary standard of 1 percent in 1955. The manufacturers of the paints in question in New York were not merely small, fly-by-night operations. Among them were Benjamin Moore and Glidden.

Such evidence led the authors of a review of the literature to conclude that, "... contrary to public beliefs and in spite of the change in paint technology and local regulations governing lead content, interior paint with significant amounts of lead was still available in the 1970s."⁵⁹

It is, of course, likely that during the 1940s some exterior house paint was applied to the interiors of homes. Exterior paint more often had a high lead content than interior paint, and could therefore have contributed significantly to the number of dwellings with lead paint. However, not until after the decade had passed did it become industry practice to place labels on paint cans warning customers of the dangers of lead.⁴⁶

Federal legislation prohibiting the use of lead paint was passed in 1970, without industry opposition. Initial regulations, which took effect a couple of years later, set a limit of .5 percent lead; in 1978, the limit was lowered to .06 percent.

Discussion

Only an imprecise answer can be given to the question of how widespread was the problem of lead poisoning in children in the first few decades of the 20th century. Diagnosis was difficult, and systematic attempts to document the number of cases were unusual. Clearly, for every diagnosed case, several went unreported. Nevertheless, as physicians became aware of the signs and symptoms and causes of child lead poisoning in the 1920s and 1930s, it became apparent that

this was a public health problem of major proportions. During those years, numerous articles on the subject appeared in the literature, alerting the medical and scientific community to the problem.

The producers of lead pigments were not oblivious to these developments. Prior to 1940, some of their leading scientific experts expressed concern over child lead poisoning, and the lead industry's trade association was interested enough to quietly conduct a survey of its own. By the 1940s, the lead industry was concerned enough to aggressively defend itself from attack.

Despite the accumulation of the large body of knowledge of the causes and effects of lead poisoning in children over the first third of this century, lead-based paint continued on the market well into the 1940s and beyond. Over the past decades, millions of young children have been lead-poisoned by lead paint in the US. The National Health and Nutrition Examination Survey (NHANES) conducted between 1976 and 1980 found that about 700,000 children under age six had elevated lead levels.⁶⁰

The history of continued use of lead paint and child lead poisoning provides one more example of the need to maintain close public scrutiny and regulation of industries that present public health and environmental dangers. So-called self-regulation by an industry is simply not sufficient. While clear evidence for many years pointed to the need to halt the use of lead paint where young children reside, no public outcry occurred, and the lead paint industry continued to manufacture and sell its product.

The cost of deleading the several million dwelling units that currently pose, or will eventually pose, a hazard to young children would run into the billions of dollars. Public officials and community residents concerned with this problem should review the experience of those who have dealt with similar public health and environmental threats. Law suits brought by public and private entities, special taxes, and legislative action have all been used to place the economic burden of the injury to society on those most responsible. Perhaps the case of asbestos, in which the manufacturers withheld knowledge of that product's devastating effects for many years, is most pertinent. Eventually, when the hazards of asbestos did become generally known, thousands of individual victims and numerous localities and states filed suit. Another example is that of the thousands of toxic waste dumps that have been created over the last few decades. Public response has resulted in federal legislation—Superfund—that taxes the producers of many toxic substances and authorizes the government to recover the costs of clean-up from polluters.

In the case of child lead poisoning, law suits by individual victims could compensate families for the costs of medical treatment, remedial education, future lost wages, and other related expenses. Government at the local, state and federal levels might resort to both the courts and the legislative process. Compensation could be sought for past public expenditures on lead paint removal, medical screening and treatment, home inspections, and special education for victims. However, most important would be funds for lead paint removal to prevent future child lead poisonings. A recent article in this journal suggested the outlines of such a deleading program.⁶¹ Certainly the opportunity exists to eliminate this very preventable disease.

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