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YCSB

SUPREME COURT OF THE STATE OF NEW YORK  
COUNTY OF ERIE

-----X  
RICHARD K. BRENNER, et al.,

Plaintiffs,

- against -

AMERICAN CYANAMID COMPANY, et al.,

Defendants.  
-----X

**AFFIDAVIT OF  
GERALD E.  
MARKOWITZ AND  
DAVID ROSNER**

Index No. 12596/93  
(Justice Cosgrove)

DAVID ROSNER and GERALD E. MARKOWITZ, being duly sworn, depose and say:

1. Gerald E. Markowitz is Professor of History and Chair of the Department of Thematic Studies at John Jay College and Professor in the Graduate School and University Center of the City University of New York. He holds a Ph.D. in History from the University of Wisconsin. A copy of his *curriculum vitae* is attached as Exhibit A to this affidavit.

2. David Rosner is Professor of Public Health and History and Co-Director of the Program in the History of Public Health at the Columbia University School of Public Health. He holds a Ph.D. in the History of Science from Harvard University. A copy of his *curriculum vitae* is attached as Exhibit B to this affidavit. Both of us have written extensively on the history of public and occupational health, including poisoning from tetraethyl lead as a public health issue in the 1920s.

3. We make this affidavit in opposition to defendants' motion for partial summary judgment.

**PRELIMINARY STATEMENT STILL TO BE WRITTEN:** These are some thoughts, but don't both editing now.

4. Although knowledge of the toxicity of lead dates back to classical times, scientific reports of children being poisoned and sometimes dying from ingesting lead paint first appeared at the turn of the century. The knowledge of childhood lead poisoning expanded throughout this century.

5. From 1891, when the National Lead Company was created through the merger of numerous previously independent firms, the manufacture of white lead pigments in the United States was dominated by the handful of large manufacturers named in this lawsuit. In addition to publicly available information, which the industry compiled, the industry had, through its own private physicians and consultants, additional knowledge of the hazards of lead.

6. Far from warning the public, the industry responded to the growing knowledge of the often deadly harm that lead paint caused children by denying or downplaying the dangers. The Lead Industries Association ("LIA") was created in part to refute concerns about lead's hazardousness. Although they knew that children were dying from ingesting lead-based paints, the pigment manufacturers and the LIA promoted their use in advertisements, films, visits to schools, hospitals and commercial establishments, and a variety of publications. In the teeth of the medical evidence, advertisements often extolled lead paints for their supposed purity, cleanliness and sanitary benefits.

7. The defendant companies were major manufacturers of alternative pigments and paints, and therefore knew that by the early 1920s, at least, alternatives to lead

were available. They knew, too, that many nations had banned the use of lead paint on interior surfaces early in the twentieth century.

8. The industry and the LIA forestalled efforts to eliminate and remedy the problem of childhood lead poisoning caused by paints containing white lead. They opposed warning labels until 1954, when proposed governmental bans on lead paint convinced them to accept warning labels as a less economically harmful result. And they acknowledged the harms caused by lead paints only after lead paint ceased being a profitable enterprise.

# I.

## THE GROWING KNOWLEDGE ABOUT CHILDHOOD LEAD POISONING FROM PAINT

### A. By 1926, It Was Well-Established That Lead Dust, Including Dust From Dry Paint Inside Houses, Could Poison

9. By the turn of the century, it was well-recognized throughout Europe that lead dust was extremely toxic, and that lead poisoning could be greatly reduced by controlling lead dust. By 1910, Germany, England, and France, among others, already regulated the lead industries to protect their workers from lead dust and fumes. In that year, at a meeting of the Superintendents of the National Lead Company, Alice Hamilton, M.D., the founder of industrial hygiene in the United States, delivered a speech detailing the superior protection against lead poisoning enjoyed by industrial workers in Europe as compared to America ~~???~~.<sup>1</sup> At that time, National Lead, now renamed NL Industries, controlled approximately 85 percent of the lucrative white lead pigment market.

<sup>1</sup> Alice Hamilton, "Hygiene of Lead Industry," Address to Meeting of Superintendents, National Lead Company, Chicago, Dec. 7, 1910, p.10. Alice Hamilton Papers, A-22, no. 29, Schlesinger Library, Radcliffe College, courtesy of Christopher Sellers.

10. Hamilton had decided to focus on the lead industries because she believed that there was so much that could be accomplished there. Her view was confirmed when she surveyed Illinois factories that used lead, finding plumbism in forms that had been eliminated in Europe decades earlier. ~~(WARREN 137)~~ Exh 3

11. National Lead reported to its stockholders in 1912 that, "[i]n the manufacture of the various products of Lead, there are two sources of danger to the health of workmen therein employed; viz., the fumes arising from the smelting or melting of metallic lead, and the dust arising in the process of making white lead and lead oxides."<sup>2</sup> Exh 4

12. In 1923, the Provincial Board of Health of Ontario published a 300-page report and literature review on lead poisoning. The Ontario report noted that dust and fumes were the major sources of lead poisoning, and that, "It is the continued daily inhalation of small quantities of lead rather than an occasional or single larger dose which

<sup>1</sup> National Lead Company, Annual Report, December 31, 1912, pp. 7-9, NLI 000131, 000136. In 1919 the Chairman of the National Lead Company's Manufacturing Committee, in an address at the National Safety Council's Annual Meeting, described the means of the "safe handling of white lead and lead in dusty forms. The prime object behind all is to keep lead dust out of the nose and mouth of the worker . . . ." "Lead Poisoning and its Prevention," American Journal of Public Health, 10 (December 1920), 1015. In 1921 National Lead's President, Edward Cornish, wrote to David Edsall, then the Dean of Harvard's Medical School, stating that lead manufacturers, as a result of "fifty to sixty years" experience, agreed that "lead is a poison when it enters the stomach of man." Edward J. Cornish to David Edsall, May 12, 1921, courtesy of Chris Sellers. Exh 4

Other industry leaders were also aware of this fact. F.V. Hammar, President of Hammar Brothers White-Lead Company, wrote, "[t]he cardinal principle of lead-works hygiene . . . is to prevent the lead salt, in any form, from entering the nose or mouth." F.V. Hammar, "Discussion of Edward Ewing Pratt, 'Lead Poisoning in New York City,'" American Labor Legislation Review, no. 2 (June, 1912), at 282. Hammar Brothers' white lead plant was subsequently acquired by Eagle-Picher.

causes lead poisoning."<sup>3</sup> This latter observation about the serious cumulative effects of "minute quantities of lead" had already been made by Sir Thomas Oliver, the eminent British industrial physician, in 19 [TEACUP 29ff, 31;],<sup>4</sup> and even earlier by Samuel L. Dana, the American doctor who, in 1848, translated the first modern medical treatise on lead poisoning, written by the Frenchman Tanquerel des Planches ten years earlier.<sup>5</sup> This point was further documented by Torald Sollman of Western Reserve University. Sollman warned that even very small doses of lead might produce non-clinical effects, and that there was a wide gap "between clinical disease and harmlessness."<sup>6</sup>

13. Lead dust made painting an extremely hazardous occupation. Master painters took pride in their craft, part of which involved the mixing of pure white lead with other ingredients, including tints to make various colors. Painting also generally involved sanding of previous coats of leaded paint.<sup>7</sup> In contrast to the European unions, which generally supported banning lead paint, American unions were divided. [CW211-12] Painting was not readily amenable to the kinds of safety measures that were possible in the more controlled setting of the factory.

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<sup>3</sup> R.M. Hutton, Lead Poisoning (A Compilation of Present Knowledge), Toronto: Provincial Board of Health of Ontario, 1923, pp. 3-5, 7. *EX-5*

<sup>4</sup> Olivier, BMJ 1: 1096-1098 (1911) See HOL fn 52. Where does this quote come from? The page numbers don't correspond to the BMJ article cited in the previous fn. *EX-5*

<sup>5</sup> See Samuel L. Dana, trans. Lead Diseases: A Treatise from the French of L. Tanquerel des Planches, Lowell, 1848.

<sup>6</sup> T. Sollman, "Studies of Chronic Intoxication on Albino Rats, VI, Lead Carbonate," J. Pharmacology and Experimental Therapeutics, 19:375-384 (1922). *EX-5*

<sup>7</sup> On the dangerousness of the painting trade, see, in addition to citations infra, Ontario report, at 82. *EX-5*

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M.D. 7  
14. Alice Hamilton, the greatest expert on lead safety issues of her time, frequently remarked on the dangerousness of the painter's craft. In 1910, she stated that the "painting trades yields the largest number of victims".<sup>8</sup> In 1919, she reiterated that "Painting is, of course, the most notorious of the lead trades and in almost every hospital and dispensary painters make up the large majority of the cases of lead poisoning."<sup>9</sup>

15. To Hamilton, the solution was clear: In 1913, speaking to the International Congress of Master Painters she advocated "against the use of white lead in interior work."<sup>10</sup> She concluded her now-classic study on the "Hygiene of the Painters' Trade," which she conducted for the U.S. Bureau of Labor Statistics, with the assertion that "[t]he total prohibition of lead paint for use in interior work would do more than anything else to improve conditions in the painting trade."<sup>11</sup>

16. Experts of the period were also aware that paint dust could poison the occupants of rooms long after the paint had dried. Marion E. Rhodes of Missouri, speaking before a congressional committee in support of legislation to require warning labels on lead

<sup>8</sup> Alice Hamilton, "Lead Poisoning in Illinois," American Association for Labor Legislation, First National Conference on Industrial Diseases, Chicago, June 10, 1910, (New York: AALL, 1910), 29, 33. *Ch. 5*

<sup>9</sup> Alice Hamilton, "Lead Poisoning in American Industry," Journal of Industrial Hygiene, 1 (May 1919) pp.12, 13.

<sup>10</sup> Alice Hamilton to Mr. Verrill, February 12, 1913, *reprinted in Alice Hamilton Papers*, A-22, no. 29, Schlesinger Library, Radcliffe College, courtesy of Christopher Sellers. *Ch. 7*

<sup>11</sup> Alice Hamilton, "Hygiene of the Painters' Trade," U.S. Bureau of Labor Statistics, Bulletin No. 120, May 13, 1913, pp. 65, 66. *Ch. 7*

He emphasized the dangers of lead dust from the chalking of paint containing white lead. <sup>9</sup>  
He presented evidence from hospitals in Boston and New York. <sup>12</sup>

17. The industry was aware of the hazard from chalking paint. In 1904, before Sherwin-Williams began producing white lead, it attacked white lead as poisonous to the inhabitants of houses, publicizing to its agents a report of the French Chamber of Deputies. Under the bold headline, "DANGERS OF WHITE LEAD," Sherwin-Williams stated that this report, ~~authored by a Mr. Bretton~~, found the use of white lead paint to be "poisonous in a large degree, both for the workmen and for the inhabitants of a house painted with lead colors." Sherwin-Williams quoted the French report as opining "that the absolute disuse of white lead has become an imperative necessity," and recommending "the use of zinc white instead, which for surfaces exposed to the sea air, is also more practical."<sup>13</sup> Sherwin-Williams began producing white lead in 1910.

18. Also evidencing industry knowledge that lead paint could harm people living in houses in which it had been applied, Henry A. Gardner, director of the scientific section of the Paint Manufacturers' Association of the United States, warned of the hazard in 1914. After outlining "the great care which is exercised to prevent the absorption of lead dust in factories," he asked,

Should we not exercise similar care in guarding against lead dust in our public buildings? Many tons of corroded white lead flatted with turpentine were at one time applied to the walls and

<sup>12</sup> U.S. Congress, House, 61<sup>st</sup> Congress, Second Session, Interstate and Foreign Commerce Committee, Hearings on H.R. 21901, May 31, 1910, p.20. Chalking was considered one of the desirable characteristics of white lead, because it caused the paint surface to look ever new.

<sup>13</sup> The SWP, July 1904, at 102.

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ceilings of school rooms and hospitals. Gradual disintegration of such paint would result in formation of dried particles of white lead dust. The presence of such dust in the atmosphere of a room is very dangerous to the health of the inmates.<sup>14</sup>

Gardner's speech was published by the Educational Bureau of the Paint Manufacturers' Association. The chairman of that Bureau was Norris B. Gregg, an executive of National Lead who was active in the formation of the Paint Manufacturers' Association. ~~AFN~~

**B. By 1926, Experts Knew That Children Were Dying From Lead Paint Poisoning**

19. The 19th century saw considerable interest in lead poisoning among industrial workers, but only a few anecdotal reports of children poisoned by lead paint. In his widely known 1838 treatise, published in America in 1848, Tanquerel des Planches reported on children placing lead painted toys in their mouths and developing lead colic, and his translator, Dr. Dana, emphasized the special vulnerability of children. An 1896 report in the American Medico-Surgical Bulletin hypothesized that a baby might have been poisoned by paint on a toy soldier.<sup>15</sup> And in 1895, D.D. Stewart, M.D. documented the greater susceptibility of children to lead in baked goods.<sup>16</sup>

20. The first well-documented studies of childhood lead poisoning from paint were carried out in Australia, where physicians were troubled by an initially mysterious

<sup>14</sup> Henry A. Gardner, "The Toxic and Antiseptic Properties of Paints" (Bulletin 41 of the Educational Bureau of the Paint Manufacturers' Ass'n) (1914), reprinted in Paint Researches and their Practical Application (Judd & Detweiler, Inc., Washington, D.C. 1917). ~~YSG exhs 3 & 4~~ *at 11, A.S. 9*

<sup>15</sup> R. Abrahams, "Acute Lead Poisoning in an Infant, with Report of Two Other Interesting Cases," American Medico-Surgical Bulletin, 10 (November 7, 1896). *Ch 11*

<sup>16</sup> D.D. Stewart, "Lead Convulsions," Am. J. Diseases of Med. Science, 109:288-306 (1895). *[from 101]*

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"Toxicity of Habitation." Eventually, 76 cases of childhood lead poisoning were identified in one hospital in Brisbane. In 1904, J. Lockhart Gibson published the first of several papers identifying lead paint as the source of the poison.<sup>17</sup> He urged that "the use of lead paint within use of children should be prohibited by law."<sup>18</sup> In 1908, A. Jeffress Turner, another of the Australian physicians who had studied childhood lead poisoning, delivered a "President's Address" to the Section of Disease of Children which concluded that the lead poisoning was due to paint powder that stuck to children's fingers which they then bit or sucked. He counted 262 children treated for lead poisoning in the Brisbane Children's Hospital since 1892, and urged that childhood lead poisoning be prevented by not using white lead on surfaces accessible to children.<sup>19</sup> Gibson's findings were published in the British Medical Journal in 1908.<sup>20</sup>

21. During the same years, the especial vulnerability of children to lead poisoning was becoming better documented. Sir Thomas Oliver identified the dangers to the fetus and to children of lead exposures in utero. He successfully campaigned to have women removed from lead making industries in Great Britain that included white lead factories.<sup>21</sup>

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<sup>17</sup> J. Lockhart Gibson, "A Plea for Painted Railings and painted Walls of Rooms as the Source of Lead Poisoning," Australian Medical Gazette, April 20, 1904. (X 11)

<sup>18</sup> J. Lockhart Gibson, "The Importance of Lumbar Puncture in the Plumbic Ocular Neuritis of Children," Australian Medical Congress Transactions, 11 (1905). (X 11)

<sup>19</sup> A. Jeffress Turner, "Lead Poisoning in Childhood," Australasian Medical Congress, 1908, pp. 2-9. (X 11)

<sup>20</sup> Lockhart Gibson, "Plumbic Ocular Neuritis in Queensland Children," British Medical Journal, 2 (November 14, 1908). (X 11)

<sup>21</sup> Thomas Oliver, "A Lecture on Lead Poisoning and the Race," British Medical Journal, 1096-1098 (May 13, 1911). (X 6)

22. In 1908, Alice Hamilton noted that "lead is a most potent producer of abortion, and it is very rare that a woman lead worker bears a healthy child at term."<sup>22</sup>

23. In 1912, a medical text published in the United States stated that young people were more vulnerable to lead poisoning than were adults.<sup>23</sup>

24. In recognition of the special vulnerability of children and fetuses, National Lead stated in that year that it did not employ women in its factories "except in such occasional capacity as messenger, helper, etc.," and did not employ children at all.<sup>24</sup>

25. Two years later, Kenneth Blackfan, a pediatrician at Johns Hopkins and his colleague, Henry Thomas, wrote an article which detailed a case of a five-year-old boy from Baltimore who died of lead poisoning from white lead paint bitten from the railing of his crib. They concluded that "lead appears to have a special effect on the meninges and the central nervous system and that it may not infrequently be the unsuspected cause of so-called serious meningitis."<sup>25</sup>

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<sup>22</sup> ~~Alice~~ Hamilton, M.D., "Industrial Diseases, With Special Reference to the Trade in Which Women are Employed," Charities and the Commons 20 (Sept. 5, 1908) 655, 658.

<sup>23</sup> ~~Thomas~~ Legge and ~~Kenneth~~ Goadby, Lead Poisoning and Lead Absorption, New York: Longmont, Green and Co., 1912, p. 35.

<sup>24</sup> National Lead Company, Annual Report, December 31, 1912, pp. 7-9, NLI 000131-000136.

<sup>25</sup> Henry Thomas and Kenneth Blackfan, "Recurrent Meningitis, Due to Lead in a Child of Five Years," American Journal of Diseases of Children, 8 (November 1, 1914), 380. This article marked the beginning of interest in lead poisoning in Baltimore's medical and public health community. Baltimore was to remain in the forefront, introducing the first free diagnostic tests for lead poisoning, conducting health education campaigns, and passing the earliest laws in the United States restricting the use of lead paint. Baltimore's experience is chronicled in Elizabeth Fee, "Public Health in Practice: An Early Confrontation with the 'Silent Epidemic' of Childhood Lead Paint Poisoning," Journal of the History of Medicine and Allied Sciences, 45 (October 1990), 570-606.

26. In 1914 and in 1917, there were further reports of children poisoned by lead paint in Australia.<sup>26</sup>

27. In 1917, in an article in the American Journal of Medicine, Dr. Blackfan reported on ~~the~~ cases of lead poisoning in children from the Harriet Lane Children's Home in Baltimore, reviewed the already extensive English language literature on lead poisoning in children, and described its neurological and physiological symptoms. He observed that children were poisoned by gnawing on lead-painted objects, mentioning specifically the white paint on cribs, that ~~children~~ <sup>they</sup> are particularly vulnerable, and that their ~~children's~~ convulsions ~~caused by lead~~ are generally very persistent and result in a high mortality rate.<sup>27</sup>

28. ~~CW37 n.19~~ Between 1911 and 1920, there were 8 reports of children dying of lead poisoning. <sup>27<sup>a</sup></sup> Between 1921 and 1930, as awareness of childhood lead poisoning grew, there 31 children were reported as having died from this cause. <sup>EX-17</sup>

29. In the early 1920s, numerous articles appeared that linked lead-based paint to lead poisoning of children.<sup>28</sup> Dr. John Ruddock's article in the Journal of the

<sup>26</sup> A. Brent, W. J. Young, "The Occurrence of Lead Poisoning Amongst North Queensland Children," Annals of Tropical Medicine and Parasitology, 8 (January 1, 1914), 575-590; Lockhart Gibson, "Diagnosis, Prophylaxis and Treatment of Plumbic Ocular Neuritis Amongst Queensland Children," Medical Journal of Australia, 2 (September 8, 1917), 201-204.

<sup>27</sup> Kenneth D. Blackfan, "Lead Poisoning in children with Especial Reference to Lead as a Cause of Convulsions," Am. J. Medical Sci., 153 (1917), 877-887. [check title] [ALSO, is this the same article as cited by Fee? Is it abt children in the Harriet Lane Children's Home???

<sup>28</sup> See, e.g., Robert Strong, "Meningitis Caused by Lead Poisoning in a child of Nineteen Months," Archives of Pediatrics, 37 (January 1, 1920) (child poisoned by lead paint); L. Emmett Holt, "General Function and Nervous Diseases," in The Diseases of Infancy and Childhood for the Case of Students and Practitioners, Chapter 11, 8<sup>th</sup> ed., 1923

American Medical Association identified window sills and porch and crib railings as sources of lead poisoning, and proclaimed that, "A child lives in a lead world."<sup>29</sup> Dr. Carl V. Weller emphasized the danger to children of chewing and sucking on painted surfaces: "The importance of non-industrial sources for lead in infantile and juvenile meningo-encephalopathy cannot be too strongly emphasized." He described the neurological symptoms associated with childhood lead poisoning, including maniacal disturbances, lethargy, convulsions and coma.<sup>30</sup>

30. The Ontario report of 1923 stated that children were twice as susceptible to lead poisoning as adults.<sup>31</sup> It cited Oliver's finding, based both on observations of women workers and on animal experiments, that the child of an asymptomatic mother would suffer lead poisoning. <sup>the report</sup> It also cited data on miscarriages and stillbirths among female lead workers, and even among the wives of ~~male~~ lead workers.<sup>32</sup> The report further noted

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(describing 7 deaths in 8 cases, all caused by eating paint); L. Emmett Holt, "Lead Poisoning in Infancy," American Journal of Diseases of Children, 25 (January 1, 1923) ; Council of Queensland Branch... , "An Historical Account of the Occurrence and Causation of Lead Poisoning Among Queensland Children," Medical Journal of Australia, 1 (February 11, 1922).

<sup>29</sup> John Ruddock, "Lead Poisoning in Children with Special Reference to Pica," Journal of the American Medical Association, 82 (May 24, 1924). JAMF

<sup>30</sup> Carl Vernon Weller, "Some Clinical Aspects of Lead Meningo-Encephalopathy," Annals of Clinical Medicine, 3 (1925), 604-613; see also C.V. Weller and A.D. Christensen, "The Cerebrospinal Fluid in Lead Poisoning," and S. McLean and R. McIntosh, "Studies of the Cerebrospinal fluids in Infants and Young Children," both in The Human Cerebrospinal Fluid, pp. 299-300 (1924); T. Suzuki and J. Kaneko, "Serious Meningitis in Infants Caused by Lead Poisoning from White Powders," J. Oriental Med., Jan. 1924. 19 27

<sup>31</sup> R.M. Hutton, Lead Poisoning (A Compilation of Present Knowledge), Toronto: Provincial Board of Health of Ontario, (1923) pp. 10, 63.

<sup>32</sup> Id. at 11-14.

the effects on intellectual development and on the central nervous system, and discussed the difficulties of diagnosing lead poisoning.<sup>33</sup>

31. In 1923, L. Emmett Holt, the most noted pediatrician of the 1920s, wrote about the "greater incidence of cerebral complications in children," and possible "slightly retarded development" and "mental defectiveness" resulting from lead poisoning.<sup>34</sup> In his textbook of that same year, Holt described 7 deaths in 8 cases, all caused by eating paint.<sup>35</sup>

32. Also in 1923, childhood lead poisoning was noted in another authoritative textbook: A.I. Abt, Pediatrics VII: 246-249 (1923), which mentioned "licking painted walls" as one cause, and observed that "Poisoning with lead is probably more common in children than generally supposed."<sup>359</sup>

33. In 1926 Charles F. McKhann, a Harvard physician, detailed seventeen case studies, concluding that lead poisoning was relatively frequent in children and was usually associated with the ingestion of lead paint.<sup>36</sup>

34. By 1926, there were at least 15 U.S. medical publications identifying lead paint from cribs, toys and woodwork as a major source of poison, in addition to those published abroad.

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<sup>33</sup> Id. at 14, 28, 31.

<sup>34</sup> L. Emmett Holt, "Lead Poisoning in Infancy," American Journal of Diseases of Children, 25 (January 1, 1923).

<sup>35</sup> L.E. Holt and J. Howland, The Diseases of Infancy and Childhood (8th ed. 1923) [from HOL -- but we have no page cite]

<sup>35a</sup>  
<sup>36</sup> Charles F. McKhann, "Lead Poisoning in Children," American Journal of Diseases of Children, 32 (1926), 386-392.

35. Even then, it was recognized that these numbers vastly understated the true number of deaths. Lead poisoning was often misdiagnosed, so that "many cases [of lead-poisoned children] were overlooked by physicians and parents."<sup>37</sup>

36. In sum, by 1926, there were several bodies of knowledge that provided strong and ample convergent evidence of the toxicity of lead paint. There was the direct evidence of children poisoned by lead paint. There was the evidence of painters poisoned by lead paint. And there was evidence of the harms caused by lead dust, of the dangers of small, cumulative doses of lead, of the special vulnerability of children, and of the harms lead caused to the nervous system in particular. These bodies of evidence had acquired more than sufficient weight such that the manufacturers of lead pigments should have ceased producing it, at the very least for interior use, before 1926. Indeed, as shown below, many countries did ban such use before 1926.

C. After 1926, Knowledge About Childhood Lead Poisoning From Paint Continued To Grow

37. In 1927, the United States Bureau of Labor Statistics published Deaths From Lead Poisoning, authored by Frederick Hoffman, a prominent statistician then working for the Bureau. Using data from 14 cities and states ~~and from the Metropolitan Life Insurance Company [??]~~, Hoffman counted 19 children who died from lead poisoning,

<sup>37</sup> L.W. Holloway, "Lead Poisoning in Children," Journal of the Florida Medical Association, 13 (1926) 94-100; see also Ruddock, I, "Lead Poisoning in Children," I-Am-Med. Ass'n, 82 (1924) 1682-84 (same). Many articles on childhood lead poisoning in the ensuing years also remarked on the underdiagnosis and consequent underestimation of the problem.

including seven who were poisoned from eating the paint from windows, walls, toys and cribs.<sup>38</sup>

38. In 1930 Louis Dublin, a statistician at the Metropolitan Life Insurance Company, published in the Company's Statistical Bulletin responses to a survey of seventy-five pediatricians about childhood lead poisoning. Dr. Charles F. McKhann of Harvard Medical School responded "that he had seen fifty cases of lead poisoning in children during six years in the Children's Hospital. He further stated that the 'lead is obtained from chewing paint from the crib, woodwork about the house and toys."<sup>39</sup> **NEED TO CHECK THESE QUOTES.** Doctor Arthur Abt, author of Abt's Pediatrics, wrote Dublin that "Lead poisoning in children is not uncommon." Doctor C.G. Grulee, Chicago, author of textbooks on children's diseases, . . . said, "I think the points mentioned by the pediatricists are well taken, in fact, I agree absolutely in every way with them." Dr. Harold K. Faber, Professor of Pediatrics at Stanford University School of Medicine, wrote that he was "surprised that the subject had not come to the attention of your Company long ago," and that "every pediatricist of experience keeps it in mind when he is dealing with cases of convulsions without fever, severe secondary anemias with constipation and abdominal pain, and the like." Dr. Faber mentions four recent references in American pediatric literature, together with one South

<sup>38</sup> Frederick Hoffman, "Deaths from Lead Poisoning," U.S. Bureau of Labor Statistics, Bulletin No. 426 (1927). According to HOL, he counted 7 deaths. In what time period?? YSG exh. 7.

<sup>39</sup> Louis Dublin to Ella Oppenheimer, September 14, 1933, courtesy Christopher Warren. Is this citation correct? The survey results were published in [Met Life's?] Statistical Bulletin 11(10):4, 1930 [cite from HOL 25 -- see also CW 252; Rabin 1669; Teacup 8)]. Then, later, Dublin wrote to Oppenheimer abt industry reaction. HOL points out that the letter says "there was strong remonstrance by the Lead Industries Association." Our quote doesn't mention LIA specifically.

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American reference and one Japanese. Dr. A.G. Basler, Professor of Pediatrics at the Chicago Medical School, <sup>write</sup> writes that the condition is well known and that he has "for 25 years warned parents as to cribs, toys, etc., painted with lead paint."<sup>40</sup>

39. Summarizing, Dublin stated, <sup>that</sup> "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. ... A majority of the pediatricists agreed that chronic lead poisoning in infancy and childhood is by no means a rare condition .... Lead poisoning is a real source of danger to infants and young children ...."<sup>41</sup>

Black  
paper

40. In 1930, according to Frederick Hoffman, eight children died of lead poisoning. Seven of these were poisoned by paint; the cause of poisoning in the eighth case was unknown.

FN 41A

41. In 1930, the United States Daily, a newspaper "Presenting the Official News of the Legislative, Executive and Judicial Branches of the Federal Government and of Each of the Governments of the Forty-Eight States," had a front-page story on lead poisoning and children. "Lead poisoning as a result of chewing paint from toys, cradles and woodwork is now regarded as a more frequent occurrence among children than formerly, and all children's hospitals, realizing the extent of the dangers from this source, are coming to use a lead-free paint on their beds, toys, furnishings and interior decorations . . . ." It was reported that Dr. Russell of the United States Public Health Service said, "children are very

[C] (?)

<sup>40</sup> Louis Dublin to Ella Oppenheimer, September 14, 1933, courtesy Christopher Warren

<sup>41</sup> Metropolitan Life Insurance Company, Statistical Bulletin, 11 (October 1930), 4-5.

[5] susceptible to lead . . . small amounts of lead which may cause only chronic lead poisoning in an older person may be of sufficient quantity to produce acute poisoning, leading to death, in an infant."<sup>42</sup>

42. In 1931, Dr. McKhann delivered a paper before the American Neurological Association in Boston, in which he asserted that "the most common cause of ingestion of lead appears to be the habit of small children of chewing paint from toys, cribs or woodwork of the house."<sup>43</sup> Also in 1931, Dr. Edward Vogt, from the Children's and Infants' Hospitals in Boston, delivered a paper, later published in the Journal of the American Medical Association, in which he sought to demonstrate x-ray signs of lead poisoning in infants and children to the relatively frequency of this condition and its possible serious consequences. He noted that "the most frequent source of lead ... is from paint off the furniture, woodwork and toys. As everyone knows, infants have a common tendency during the teething period to chew at anything they can get into their mouths. When sufficient lead paint is ingested, symptoms of plumbism develop. This occurs most commonly between the ages of 1 and 2 years."<sup>44</sup>

43. In 1932, McKhann published a paper on the "cerebral manifestations" of childhood lead poisoning, and cited paint as the most common source. He wrote,

<sup>42</sup> "Lead-free Paint on Furniture and Toys to Protect Children," United States Daily, Nov. 20, 1930, p.1.

<sup>43</sup> Charles F. McKhann, "Lead Poisoning in Children," The Archives of Neurology and Psychiatry, 27 (February, 1932), 294-295.

<sup>44</sup> Edward Vogt, "Roentgenologic Diagnosis of Lead Poisoning in Infants and Children," Journal of the American Medical Association, 98 (January 9, 1932), 125. CHECK QUOTE

①  
"Children who survive a severe lead encephalitis are frequently left with permanent neurologic disorders."<sup>45</sup>

44. In 1932 alone, there were 17 diagnosed cases of lead poisoned children, including 2 deaths, at Montreal's Children's Memorial Hospital. H.B. Cushing, a professor of pediatrics at McGill University, told a Symposium on child lead poisoning at the Annual Meeting of the American College of Physicians that

[p]ractically all our cases in children this year came from one cause, i.e., from eating paint. ... "I went to several leading paint companies of the city and all assured me that none of their paints contained poison, in fact might be used as infant food. ... [B]y calling on different experts I gathered the following information. Formerly white lead was used as a basis in most paints. In recent years this had been displaced by other substances. ... [T]he better paints used indoors do not contain any lead and are made of zinc or titanium.

Cushing noted that "Every child ... tends to put everything in its mouth and chew it." He advocated legislation similar to that in many other countries, "prohibit[ing] the use of lead in indoor paints."<sup>46</sup> *yet over* For two decades thereafter, the industry *continued to* manufactured, promoted, and *sell* ~~sell~~ lead pigments for interior paints.

45. In 1932, Eagle-Picher acknowledged in a letter that lead paint causes lead poisoning, but contended (erroneously) that lead sulphate is "much less poisonous than the [c]arbonate Dutch [p]rocess [l]ead," because "the former is much more soluble in human

<sup>45</sup> TEACUP 12. *McKham McKham* ②③

<sup>46</sup> H.B. Cushing, "Lead Poisoning in Children," International Clinics, 44th Series, v. 1, 189-191 (1934) (Introductory Remarks at a Symposium on Lead Poisoning in Children at the Annual Meeting of the American College of Physicians on Feb. 9, 1933). RABIN 69.

*such as those given to Cushing in Montreal*  
~~These assurances from the industry~~  
*were repeated by the industry for many years*

John K. MacGregor, then an Eagle-Picher executive and a few years later president of John K. MacGregor Lead, received a copy of this letter (32) gastric juice than the latter and causes more rapid and severe poisoning in animals. (47) Eagle-

Picher was the major producer of white lead sulfate, although it also produced white lead carbonate.

46. Frederick L. Hoffman, in 1933 a consulting statistician for Prudential Insurance Company of America, confirmed that childhood lead paint poisoning was serious.

He noted <sup>seven</sup> ~~four~~ deaths among <sup>children</sup> ~~boys~~ under the age of three during 1930 caused ~~either~~ by <sup>eating</sup> ~~paints or chewing painted wood.~~ ~~licking paint off freshly-painted furniture~~ ~~Chewing lead~~

~~licking paint off freshly-painted furniture~~ ~~Chewing lead~~

~~paint from porch...~~ ~~Or chewing paint from his crib,~~ ~~He also noted three deaths of girls~~

~~under the age of two from lead poisoning "caused by the gnawing of painted wood..."~~ ~~A~~

~~history of eating paint [or] the habitual eating of paint from furniture and pencils."~~ <sup>48</sup>

47. In November 1933 the Massachusetts Department of Labor and Industries (with ~~later LIA Health and Safety Officer~~ <sup>later to become LIA</sup> Manfred Bowditch, as the Occupational Hygienist in the Division of Industrial Safety) warned in a Bulletin focussed on occupational

~~hazards~~, that "many serious and even fatal cases of lead poisoning among infants have been traced to the sucking or chewing of lead-painted surfaces. Toys, cribs, furniture and other objects with which infants may come in contact should not be painted with lead colors."<sup>49</sup>

48. Also in 1933, Drs. McKhann and Vogt published "Lead Poisoning in Children" in the Journal of the American Medical Association, abstracted in Scientific

<sup>47</sup> YSG: letter sent on behalf of the Eagle-Picher Lead Co., January 7, 1932, **ORIGINALLY** included in your aff., but then deleted. (32)

<sup>48</sup> Frederick L. Hoffman, Lead Poisoning Legislation and Statistics (1933), courtesy of Christopher Warren. *26*

<sup>49</sup> Massachusetts, Department of Labor and Industries, Division of Industrial Safety, Industrial Bulletin No. 13, "Revised Rules, Regulations, and Recommendations Pertaining to Structural Painting," November 1, 1933, p. 8. (32)

American under the title, "If Your Children Chew Paint." It reported:

Unfortunately, infants and children very often eat or swallow enough lead to be poisoned by it and in a large percentage of cases they die. Ninety-five cases of lead poisoning have been observed at the Infants' and Children's Hospital, Boston, during the past nine years . . . . Most children suffering from lead poisoning seem to have ingested the lead by chewing the paint from woodwork, furniture, or toys."<sup>50</sup>

35

The JAMA article stated that "in the majority of cases of lead poisoning due to ingestion of paint, the pica has apparently been merely a pernicious habit, unrelated to any underlying abnormal condition." The ~~article's~~ authors reported that ~~Lead Industries Association~~ LIA Secretary Felix Wormser told them "that the lead industry and the manufacturers of cribs and toys, informed of the danger to children from the ingestion of lead paint, have cooperated by substituting other types of pigments for the lead pigments formerly used."<sup>51</sup> Unfortunately, *shown below, this was not true.*

49. Also in 1933, two articles on childhood lead poisoning were published in the Medical Journal of Australia: one, by L.J.J. Nye, stating that "the case against lead paint has been reasonably proven," and that the industry sought to suppress the information; and another, by C. Badham, warning that lead poisoning was present at the first pathological signs of the action of lead.<sup>52</sup>

AO

50. In 1935, Ross and Brown reported that a Toronto hospital had reported 23 cases of childhood lead poisoning, including 5 deaths, in a two-year period in the early

<sup>50</sup> "If Your Children Chew Paint," Scientific American, 149 (December 1933), 291.

<sup>51</sup> Charles F. McKhann and E.C. Vogt "Lead Poisoning in Children," JAMA, 101 (October 7, 1933), 1131.

<sup>52</sup> WG 52 n.132

*Low-bar v. Adele will check Badham*

35

7B2A: 52b (36)

1930s. Lead poisoning was, they wrote, the most common cause of poisoning in children.

They urged prohibiting the use of lead paint for interior work, as well as for toys and children's furniture. CITE?? (Lancet?)

51. In that year, 36 painters died of lead poisoning in the United States. 52b

SOURCE??

52. In 1931, under Commissioner Huntington Williams, Baltimore's Health Department, had investigated the deaths of two children as a result of lead paint poisoning. 52b

34 RABIN 69. Thereafter, in 1935, it was the first city to offer free laboratory diagnostic tests to assess the blood levels of any person with suspected lead poisoning.<sup>53</sup> During the first three years of testing, 57 cases of lead paint poisoning in children were diagnosed, confirming the proposition that lead poisoning from paint was greatly underdiagnosed. Between 1931 and 1940, Baltimore recorded 135 cases in children under 10, including 49 deaths.<sup>54</sup> By 1949, the number of documented cases of lead poisoning in children had risen to 213, including 76 deaths.<sup>55</sup>

53. In a 1935 paper, Kehoe stressed the dangers to children with history of pica, and the frequent presence of lead-painted objects within their reach.<sup>56</sup>

54. Ann Minot was a co-author of Joseph Aub, the Harvard University doctor who was engaged in [1920?] by the National Lead Institute, a predecessor of the LIA, and subsequently by the LIA itself, to do research on the health effects of lead. By 1938,

52a Hutterman Statistics  
<sup>53</sup> Fee, 581.

52b - AD

~~very with~~

<sup>54</sup> McDonald and Kaplan [cited in CW 308 and Rabin 69] 39

<sup>55</sup> M. Q. McDonald, "Maryland -- Toxic Finishes," July 14, 1949, NCA 0 03161-62. 41

<sup>56</sup> RABIN 71 41

even Minot acknowledged that "the prolonged absorption of smaller amounts of lead might result in ... permeability changes in nerve cells [that] could hardly fail to impair the optimal functioning of highly specialized nervous tissue."<sup>57</sup> ~~In that same year, Monier-Williams ??? wrote that there is no known safe level for lead.~~<sup>58</sup>

55. In 1942, the Journal of the American Medical Association published a paper reporting 49 fatal cases of pediatric lead poisoning between 1931 and 1940 in Baltimore alone.<sup>59</sup>

56. In 1943, Randolph Byers, M.D. and Elizabeth Lord, Ph.D. published research findings that many lead poisoned children in Boston suffered from retarded mental development as a result of lead paint poisoning contracted in infancy.<sup>60</sup> Time magazine summarized these findings under the headline, "Paint Eaters." "All but one child, Dr. Lord discovered, were school failures. Only five had normal I.Q.s, and four of the five were so erratic that they could not learn easily."<sup>61</sup>

57. Between 1940 and 1950, the number of children screened increased fourfold, and the number of cases diagnosed increased proportionately.<sup>62</sup> In 1948-49, the LIA funded a study by Anna Baetjer in Baltimore. Examining the records and homes of 60

<sup>57</sup> TEACUP 25. *Minot*

<sup>58</sup> TEACUP 34. *AC*

<sup>59</sup> J. McDonald and E. Kaplan, "Incidence of Lead Poisoning in the City of Baltimore," J. Am. Med. Ass'n, 119: 870-72 (July 11, 1942). CW 308N.61 *39*

<sup>60</sup> Randolph Byers and Elizabeth Lord, "Late Effects of Lead Poisoning on Mental Development," Am. J. Diseases of Children SANTIAGO EXH 13. *43* ~~155 ex~~

<sup>61</sup> "Paint Eaters," Time, December 20, 1943, p. 49. *43* *155 ex*

<sup>62</sup> CW 304-05.

children reported by doctors and clinics there, Baetjer found that 51 of them had lead levels over 100  $\mu\text{g}/\text{dl}$  -- well above even Kehoe's industrial threshold of 80  $\mu\text{g}/\text{dl}$ . Eight of these children died.

58. In 1951, Celeste Felder and 15 other children died of lead poisoning in New York City. Celeste was repeatedly misdiagnosed before she died.<sup>63</sup>

59. Between 1951 and 1953, according to George M. Wheatly, of the American Pediatrics Association, as reported in the New York Times, there were 94 deaths and 165 cases of childhood lead poisoning . . . in New York, Chicago, Cincinnati, St. Louis, and Baltimore."<sup>64</sup>

60. In 1955, Robert Kehoe estimated that at least 250 to 300 child deaths per year were attributable to lead paint.<sup>64a</sup> Citation?? [See CW's estimate of 240/yr at 40]

61. In 1952 and 1954, there were reports of widespread lead poisoning in Baltimore and Boston respectively.<sup>65</sup>

62. In 1955, a study was published confirming the Byers and Lord findings on lead's effects on children's nervous system, even absent any overt evidence of nervous system involvement.<sup>66</sup>

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<sup>63</sup> CW 311

<sup>64</sup> New York Times, November 9, 1954, p. 26.

<sup>65</sup> ~~HOL 34~~ H. Williams, E. Kaplan, C.E. Couchman, R.R. Sayers, "Lead Poisoning in Young Children," Public Health Reports, 67:230-36 (1952) (Baltimore); R. Byers, "Urinary Excretion of Lead in Children," Am. J. Diseases of Children, 87:548-58.

<sup>66</sup> Thurston, Middlekamp, and Mason, "The Late Effects of Lead Poisoning," J. Pediatr., 47:413-23 (1955).

63. A Baltimore study in 1956 found that two fifths of well babies had high lead levels. Dr. Julian Chisholm published a finding that year that Baltimore children exposed to lead were excreting six times more lead than industrial workers with lead exposures.<sup>67</sup>

64. In the 1970s, research by Dr. Herbert Needleman and others demonstrated that even levels of lead poisoning that did not give rise to clinical symptoms had adverse psychological effects and effects on intellectual development. Other research showed that children retain far more ingested lead than do adults. **HOL 41.**

## II.

### MANY COUNTRIES ENACTED RESTRICTIONS ON LEAD PAINT PRIOR TO 1926

65. In 1909, France passed an act prohibiting the use of lead paint for exterior or interior painting after July 20, 1914.<sup>68</sup> In that year, Belgium had prohibited the sale and use of dry white lead, and Austria prohibited the use of white lead for the interior of houses.<sup>69</sup>

66. In the United States, in 1910, a bill was introduced in the House of Representatives that would have required "[t]hat the introduction into any state... of any white

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<sup>67</sup> J.E. Bradley et al., "The Incidence of Abnormal Blood Levels of Lead in a Metropolitan Pediatric Clinic," J. Pediatrics, 49:1-6 (1956); J.J. Chisholm and H.E. Harrison, "The Exposure of Children to Lead," Pediatrics, 18:943-58 (1956).

<sup>68</sup> Edward Ewing Pratt, "Occupational Diseases, A Preliminary report on Lead Poisoning in the City of New York . . . ." Albany, 1912, 375. ~~see ysg, ont~~

<sup>69</sup> T. Oliver, Lead Poisoning: From the Industrial, Medical And Social Points of View, (Paul B. Hoeber, New York 1914) (cited in HOL at 12).

lead or mixed paint containing white lead which is not labeled with a skull and crossbones and the words 'Poison; white lead' is hereby prohibited."<sup>70</sup> Although this bill had virtually no support -- it vied with another bill that viewed white lead in a positive light, and, in the context of the Progressive movement, sought to prevent the "adulteration" of paint by \_\_\_\_\_ -- its introduction is suggestive of the state of knowledge of lead paint hazards, and the existence of alternatives to lead, at that early date.

67. In 1919, the International Labour Organization ("ILO") held a meeting in Washington to enlist U.S. support in white lead regulation. This meeting was followed by a conference in Geneva in 1921, attended by 400 delegates from 40 countries, at which the recommendation was approved that countries should ban lead paint for interior use, and limit exterior paint to 2 percent lead. The 2 percent limit represented a sharp reduction in lead content: the so-called pure white lead paints consisted of nothing but white lead in a vehicle such as oil.<sup>71</sup>

68. Among those present at the Geneva conference was John R. MacGregor, then an executive of Eagle-Picher, and later the founder of the John R. MacGregor Lead Corp, predecessor to American Cyanamid.<sup>72</sup>

[69. In 1922 the Third International Labor Conference of the League of Nations recommended the banning of white lead for interior use.]<sup>73</sup> [CW says 1921. YSG

<sup>70</sup> U.S. Congress, House, 61<sup>st</sup> Congress, Second Session, Interstate and Foreign Commerce Committee, Hearings on H.R. 21901, May 31, 1910, p.20. (18)

<sup>71</sup> "Lead-Poisoning," Mining and Scientific Press, 123 (1921), 491 ???; CW 211-12. (47)

<sup>72</sup> Official Digest, at 868 (Dec. 1952). (47)

<sup>73</sup> "Prohibition of White Lead in Belgium," American Journal of Public Health, 13 (April, 1923), 337. (48)

says 1920. ¶¶ 39-40 contradict CW, which in turn differs from SANT. WHICH DATES are CORRECT??]

70. The ILO's efforts to ban interior use of white lead were reported in the industry press in the United States, including Paint, Oil and Chemical Review (1920), and Mining and Scientific Press (1921) [check cite]. ~~A copy of the former was in the possession of Glidden, and was produced in discovery in this action under Bates number GLD 32421.~~ These efforts were also reported in public health publications, including the Ontario report and the American Journal of Public Health (1923).

71. The lead industry's reaction to the ILO's proposals <sup>followed</sup> established a pattern of response that would continue into the future:

The attempted prohibition of lead in paint manufacture at the International labor conference at Geneva was apparently an instance of hold-up methods similar to those employed by similar sinister labor interests in this country. ... One disreputable sheet in this country which has long been recognized as a blackmailing excrescence on the industry, suggests that the prohibition should be extended to Uncle Sam's domain.

They were pleased to report that "there is little danger of any such outcome."<sup>74</sup>

72. After the ILO conference, many countries in addition to France, Austria, and Belgium (which, in 1926, ~~banned~~ broadened its legislation to ban white lead altogether for interior use), including Tunisia (1922), Estonia (1922), Greece (1922), Czechoslovakia (1923), Latvia (1924), Rumania (1924), Great Britain (1926), Sweden (1926), ~~Belgium (1926)~~, Poland (1927), Spain (1928), Yugoslavia (1931), and Cuba (1934),

<sup>74</sup> "The Prohibition of Lead," Paint, Oil and Chemical Review, 69 (June 30, 1920), [GLD 32421].

Author?

44

YSC  
exh.

Eh-26

enacted bans or restrictions on the use of white lead for interior painting.<sup>75</sup> **Germany? If so, what and when? HOL cites Oliver, at fn 57.**

73. Dr. Jeffress Turner's call for legislation prohibiting lead paint on outside surfaces accessible to children was taken up by the Council of the Queensland Branch of the British Medical Association, and in 1922 the use of lead paint on verandahs and other outside surfaces within reach of children was prohibited in Queensland, Australia.<sup>76</sup>

74. In 1924, Alice Hamilton described a "movement, sponsored by France, for the abolition of lead paint."<sup>77</sup> In her view, this movement was driven by the high prevalence of lead poisoning among painters.

at this time

75. In 1933, Frederick Hoffman published a review of legislation from numerous countries prohibiting white lead for interior use, all dating from the 1920s. Hoffman stated that by regulation dated May 27, 1930, Germany prohibited use of lead paints containing more than 2 percent lead.<sup>78</sup>

76. ~~As noted above, painters' unions in the United States were divided in their positions regarding white lead, and these divisions were manifest at the ILO conference~~

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<sup>75</sup> SANTIAGO ¶ 18 & EXH. 9. For Spain, see supplemental statement, ¶ 237 (citing Mineral Resources of the United States, 1928). **CHECK (BETH?) HOL fn 60 gives different dates (generally earlier) for many of these countries, and also some additional countries, which are in bold.** (1/9)

<sup>76</sup> Rabin 69 [SOURCE??]; see also HOL 7 & n. 32, where it says that the Ass'n "endorsed proposed legislation," in 1922, but doesn't say whether it passed. It cites Council of the Queensland Branch, British Medical Ass'n, "An Historical Account of the Occurrence and Causation of Lead Poisoning," Med. J. Australia, 1:148-152 (1922). **CHECK all this!** (50) RJM

<sup>77</sup> Alice Hamilton, "The Prevalence and Distribution of Industrial Lead Poisoning," JAMA, 83 (August 23, 1924), 585.

<sup>78</sup> Frederick L. Hoffman, Lead Poisoning Legislation and Statistics (1933). ~~[Is this an article?? book??]~~ (20)

in Geneva. CW. Some painters' unions, like the Painters District Council in Chicago [in 1924?], suggested that among the measures useful in preventing lead poisoning would be "prohibition of white lead in interior painting."<sup>79</sup> The Brotherhood of Painters, Decorators, and Paperhangers of America, an organization representing 125,000 members, predominantly house painters, stated that "the use of white lead is a grave menace to the health and lives of painters and should be forbidden."<sup>80</sup> ~~Others, however, opposed restricting the use of white lead, notwithstanding the documented and sometimes fatal poisoning suffered by their members.~~

77. ~~As a result of the successful activities of the defendants,~~ <sup>no</sup> legislation restricting the use of lead paint was passed in the United States until 1949. In that year, prompted by the Baltimore Health Department's finding of 213 cases of lead poisoning, including 76 deaths, since 1931, the State of Maryland passed a law, repealed a year later following lobbying by the LIA, <sup>80a</sup> ~~[Support??]~~ making it "unlawful to sell toys and play things, including children's furniture, finished with any material containing 'lead or other substance of a poisonous nature from contact with which children may be injuriously affected' unless such articles are so labeled as to show that the finish contains lead or other poisonous substances."<sup>81</sup> In 1951, Baltimore's Health Commissioner adopted a regulation

<sup>79</sup> "Health Conditions in the Painting Industry," American Journal of Public Health, 14 (Sept. 1924), 804; see also, W.H. Rand, "Occupational Lead Poisoning," Monthly Labor Review, 12 (Feb. 1921), 135-147.

<sup>80</sup> International Labour Office, White Lead, Geneva, 1927, p. 30.

<sup>81</sup> M. Q. McDonald, "Maryland -- Toxic Finishes," July 14, 1949, NCA 0 03161-62.

that stated, "No paint shall be used for interior painting of any dwelling or dwelling unit or any part thereof unless the paint is free from any lead pigment."<sup>82</sup>

78. In 1954, the City of New York enacted a law requiring that lead paint containers carry warnings, and in 1960 the City of New York banned interior use of lead paints.

79. In 1971, the President signed the Lead-Based Paint Poisoning Prevention Act ("LBPPPA"), which prohibited the use of lead-based paint in federally assisted construction or rehabilitation work, and provided for grants to local governments to assist in case-finding and treatment programs directed at children, and in programs to identify and remove lead-based paint from housing.

### III.

#### SAFE ALTERNATIVES TO WHITE LEAD WERE AVAILABLE YEARS BEFORE 1926

80. These statutory prohibitions would have been impossible had it not been for the development of alternative pigments that were not toxic.

81. The defendant companies either manufactured alternative pigments and/or paints containing alternative pigments. Anaconda (parent of IS&R), Glidden, and Sherwin-Williams produced zinc-based pigments<sup>83</sup> ~~[YAIR: How do you know?]~~, and National Lead pioneered the development of titanium pigments in the United States. 

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<sup>82</sup> Fee, 588.

<sup>83</sup> For IS&R, see PNYC 00012573, about their 1944-45 production of white lead and zinc oxide. BUT what about earlier years?

82. Long before 1926, zinc oxide and lithopone (also a zinc-based pigment) had been recognized as suitable alternatives for interior use. In 1892, one year after its formation, National Lead's Board of Directors discussed the question as to the desirability of selling dry lead to mixed paint manufacturers at a low price as an inducement of its use in place of the substitutes now used."<sup>84</sup> **CHECK CW.**

83. Zinc oxide was first developed in the United States in the mid-1800s. In 1907, the United States Supreme Court noted that "within the last twenty-five years, oxide of zinc gradually gained recognition among manufacturers and users of paint as being equally appropriate for purposes for which theretofore carbonate of lead had alone been recognized as appropriate, and has come to be universally conceded as possessing important useful qualities as a white pigment not possessed by carbonate of lead." Heath and Milligan Mfg. Co. v. Worst, 207 U.S. 338, 341 (1907). Zinc was known to be non-toxic. <sup>84a</sup> **YAIR: You say "See C. McCord, Kensington plant. Can you find please?"** **See exhs. cited in SANTIAGO 44-41-3.**

84. In 1904, as described above, Sherwin-Williams publicized to its agents evidence of the toxicity of lead paint and the superiority of zinc-based alternatives.

85. Lithopone, another safe alternative pigment containing zinc, was also available by [at least 1910] <sup>84b</sup> By 1920, lithopone paints were providing good quality at low cost. ~~Santiago 44-49.~~

86. Titanium-based pigments, which eventually supplanted lead pigments entirely, were commercially produced in the United States around 1918. From the outset,

<sup>84</sup> Minutes of Adjourned Meeting of Board of Directors of National Lead Co., Sept. 17, 1892 (0000-NLI-000021377).

(57)

the National Lead Company dominated the market for titanium pigments. In its 1920 Annual Report, National Lead touted the virtues of its titanium oxide pigment, which, it said had twice the hiding power of pure white lead. <sup>84c</sup> [SANTIAGO ¶ 56] According to National Lead, by 1932 its sales of titanium pigments exceeded total sales of white lead by all manufacturers, and were on the way to overtake zinc oxide and lithopone.<sup>85</sup>

87. In 1910, the U.S. Bureau of Commerce and Labor quoted from reports of the International Association for Labor Legislation on the dangers of lead in general and white lead in particular. The Report suggested the replacement, where possible, of "lead compounds through non-poisonous ones (as tin, white tin, lithopone, etc. for white lead)."<sup>86</sup>

88. In 1914, Oliver compared the merits of lead and zinc in paint and concluded that zinc was every bit as good as lead without lead's harmful health effects.<sup>87</sup>

89. In 1914, Gardner, the director of the scientific section of the Paint Manufacturers' Association, noted approvingly the development of "sanitary leadless" paints and predicted that "lead poisoning will be done away with almost entirely." Indeed, he went so far as to claim that "the use of flatted lead has been largely abandoned for wall and ceiling

*An organization in which National Lead executive  
Norms Gregg played a major role  
(see Summary)*

<sup>85</sup> SANTIAGO ¶ 62 (citing NL Proposed Findings of Fact in titanium case, Santiago Exh. 27). (57)

<sup>86</sup> "List of Industrial Poisons," U.S. Department of Commerce and Labor, Bureau of Labor, Bulletin, xx, no. 86, (Jan. 1910), 163 (58)

<sup>87</sup> Thomas Oliver, Lead Poisoning: From the Industrial, Medical, and Social Points of View, New York: Paul B. Hombre, 1914, pp. vii, 55-65. Oliver's concern about the use of white lead paint for interiors was focused the harm it caused painters, who suffered high rates of intoxication from lead paints.

*Repeated so often by the industry over the decades,*  
decoration, and its place has been taken by the more sanitary lead-less flat paints."<sup>88</sup>

Unfortunately, this latter claim was far from the truth: white lead sales had not yet reached their peak, and for decades to come the defendants would continue to promote their lead pigments and paints for interior use.

90. In 1917, The Sherwin-Williams Company recommended to the Chief of Ordnance of the War Department that government specifications for war helmet paint calling for 50% lead carbonate should be replaced by a lead-free formula containing lithopone. Sherwin-Williams observed that the advantage of the lithopone formula was that the danger of lead poisoning was entirely eliminated.<sup>89</sup>

91. In 1922, the Canadian Department of Mines published a monograph on titanium, in which it pointed out that titanium had greater hiding power than lead, and "unlike white lead, is extremely inert and absolutely non-poisonous."<sup>90</sup>

92. In 1923, the Ontario report described the "intensive investigations" conducted in France, Austria, Holland and England about the substitution of non-lead pigments for lead, and stressed the commercial competitiveness of zinc pigments: "The present tendency of opinion is towards the belief that for interior painting which is not

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<sup>88</sup> Henry A. Gardner, "The Toxic and Antiseptic Properties of Paints" (Bulletin 41 of the Educational Bureau of the Paint Manufacturers' Ass'n) (1914), reprinted in Paint Researches and their Practical Application (Judd & Detweiler, Inc., Washington, D.C. 1917).

<sup>89</sup> Letter dated June 26, 1917, Exh. 50 to Santiago Motion for Partial Summary Judgment.

<sup>90</sup> SANTIAGO ¶ 57.

exposed to the weather, zinc paints are as good, if not better, than white lead paints, not only from the hygienic point of view, which was known, but from the commercial."<sup>91</sup>

93. In 1924, the U.S. Bureau of Standards issued proposed master specifications for a lead free exterior white titanium and zinc paint.<sup>q1a</sup>

94. In 1924, Glidden introduced a house paint it called "Zinc-o-lith."

Glidden stated: "In European countries, where the use of white lead in paint is prohibited, it was found that a product similar to 'Zinc-o-lith' gave the same painting result [as white lead] at a lower cost."<sup>q1b</sup> ~~Santiago ¶ 50 (exh 22)~~

95. Lithopone production surpassed white lead production in 1926.<sup>q1c</sup> ~~Santiago ¶ 51.~~ During the 1920s, it cost two thirds to one half as much as white lead.

96. The 1928 volume of the U.S. Department of Commerce's Mineral Resources of the United States contained a section entitled "Competition Between Pigments." The "poisonous qualities of white lead," it stated, had caused lead's formerly dominant position to be eroded by zinc oxide, lithopone, and titanium. It discussed the trend toward prohibitions on white lead, specifically mentioning legislation in France, Belgium, and Spain, and described the improvements in alternative pigments that had caused them to eclipse white lead:

The increasing use of [zinc oxide and lithopone], particularly lithopone, is due to their lower first cost and to the constantly improved properties that have been attained as a result of scientific research on the part of the producers. Production of lithopone has increased from less than 30,000 tons in 1913 to more than 200,000 tons in 1928, three-fourths of which is used in the manufacture of paint.

<sup>91</sup> R.M. Hutton, Lead Poisoning (A Compilation of Present Knowledge), Toronto: Provincial Board of Health of Ontario, 1923, p.59.

Titanium pigments have been increasing in importance recently, especially since the development of titanox. ... It is claimed that this pigment excels the lead and zinc pigments in hiding power and inertness ... [I]t now appears that titanium will invade the field of lead and zinc pigments.<sup>92</sup>

Mineral Resources pointed out that the National Lead Co., one of the most important pigment producers in the United States, has secured a commanding position in the world titanium field."<sup>93</sup>

97. In 1929, the Director of the Industrial Health Division of the National Safety Council, C.O. Sappington, summarized the Report of the Committee on Lead Poisoning of the American Public Health Association by pointing to "the improvement in substitute paint bases, such as lithophone, to the point where they are essentially as acceptable as white lead or other lead compounds."<sup>94</sup>

98. [Something re Glidden's Titan-o-zinc?? See Santiago ¶ 60]<sup>94a</sup>

99. By 1929, titanium dioxide had assumed an important role as a paint pigment in European countries which had banned or restricted the use of white lead paints. Santiago ¶ 59.<sup>94a</sup>

100. After World War II, National Lead continued to sell lead paints, for both interior and exterior use, <sup>even</sup> while conceding that its leadfree paint, "in addition to matching white lead's durability and other desirable qualities, outmatches it in the thing

<sup>92</sup> U.S. Dept. of Commerce, Mineral Resources of the United States: 1928, Part I (Metals), at 350-51.

<sup>93</sup> Id. at 351. In a sales manual published after World War II, National Lead took credit for having "pioneered" the development of titanium pigments. (NLI 101869).

<sup>94</sup> C.O. Sappington, "The Prevalence of Lead Poisoning," National Safety News, 20 (September, 1929), 70.

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property-owners want most -- maintenance of fine appearance." "Push the sale of our blue and white [non-leaded] line of paints at every opportunity," National Lead urged in its Manual for salespersons,

Promote and demonstrate their advantages even to the prospect who continues to prefer white lead, being very careful, however, not to question his judgment . . . The same policy applies, of course, to our interior produces, both in the black and yellow [white lead] line and in the Wonsover line . . . In establishing the foregoing sales policy, there is naturally no intention of disparaging white lead in the slightest degree.<sup>95</sup>

While National Lead's Sales Manual went on to list many advantages of its non-leaded paints, nowhere did the Manual mention the poisonousness of white lead.

#### IV.

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#### THE LEAD INDUSTRY: BUILDING A MARKET FOR WHITE LEAD, 1900-1928

101. At the turn of the century, with approximately 85 percent of all sales the National Lead Company completely dominated the white lead pigment market. Between 1914 and 1924, however, three major new producers entered the market: Sherwin-Williams, Anaconda, and Glidden, reducing National Lead's share to between 60 and 70 percent of the market. In 1928, the rising volume of alarms about the hazardousness of lead, and the need for coordination among lead producers and manufacturers, led to the formation of the Lead Industries Association ("LIA"), which would play a key role in pressing for the continued and expanded use of lead.

95A Exh 2

<sup>95</sup> National Lead Sales Manual (undated, but apparently published shortly after World War II), section entitled "Selling Dutch Boy Products" (NLI 101869).

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102. The National Lead Company was formed in 1891, through the merger of 14 white lead manufacturers whose stock had been controlled by the National Lead Trust. At that time, National Lead also acquired controlling interests in 17 other companies. ~~From then through the early years of the 20th century, National Lead completely dominated the market, selling approximately 85 percent of the white lead sold in the U.S.~~ <sup>96</sup> *ELN*

103. Through its advertisements and promotions, National Lead created a market for white lead, promoting and reinforcing the perception that no paint was as good, or as safe, as white lead.

~~WHAT ABOUT SAVE THE SURFACE? SEE HOL 18. Was it organized by the white lead producers??~~ *NO*

104. Early in the century, manufacturers of zinc-based paints published ads attacking lead paints as poisonous. An example of this from Sherwin-Williams' magazine was cited above. Instead of warning their customers that white lead was hazardous, particularly for interior use, National Lead silenced these advertisements by reaching an agreement, with zinc pigment manufacturers to refrain from attack ads. This agreement was first reached sometime between 1905 and 1918.<sup>97</sup>

105. National Lead specifically promoted the use of white lead paint by and for children in residential interiors. The Dutch Boy logo of National Lead Company, showing a young boy carrying a can of lead paint, was a familiar symbol in the first half of the 20<sup>th</sup> century and was an essential part of its marketing strategy. Throughout the early decades of the century, the Dutch Boy logo appeared in thousands of issues of popular and

<sup>96</sup> CITATIONS *JLB*

<sup>97</sup> Heckel at 266 (7-SWP-6125). *66*

trade magazines such as Good Housekeeping, Better Homes and Gardens, American Architect, Painter and Decorator, Hardware Age, and Modern Hospital.

106. In 1920, The Dutch Boy Painter told its readers, "Do Not Forget the Children -- Someday They May Be Customers." YSG Ex. 20 In 1924, National Lead produced The Dutch Boy's Lead Party: A Paint Book for Girls and Boys. **CHECK title.** Its cover showed the Dutch Boy, bucket and brush in hand, looking at lead soldiers, light bulbs, shoe soles and other members of the "lead family." Throughout the booklet the Dutch Boy is featured carrying the bucket inscribed "Dutch Boy White Lead."<sup>98</sup> To emphasize these lead paints' benign qualities, National Lead depicted a child in a bathtub scrubbing himself with a brush, his Dutch Boy cap and clothes and shoes slung on a chair, and a can of "Dutch Boy All-Purpose Soft Paste" and paint brush next to him. The caption read "Takes a Scrubbing With a Smile."<sup>99</sup> National Lead explained the benefits of distributing children's paint books in the Dutch Boy Painter. "The kiddies take it home and it carries your name in such a way that it will not be forgotten when the time comes to buy paint."<sup>100</sup> *Exh. 161*

107. National Lead ~~ads~~ frequently featured pictures of children painting. The Dutch Boy Painter in 1919 featured a photograph of a three year old child painting a house.<sup>101</sup> *Promotional materials* Other National Lead ~~ads~~ from the mid-1920s recommended white lead for the nursery [~~107~~ 101a] and showed a baby smudging a freshly painted wall with copy reading, "There is no cause for worry when fingerprint smudges or dirt spots appear on a

<sup>98</sup> National Lead Company, "The Dutch Boy's Lead Party" [ca. 1923].

<sup>99</sup> "Takes a Scrubbing with a Smile." [Dutch Boy] The Modern Hospital, April 1937.

<sup>100</sup> YSG ¶ 55 & exh 42.

<sup>101</sup> Exhibit 10 ysg.

wall painted with Dutch Boy white-lead. . . . Painted walls are sanitary, cheerful and bright." [ysg ex 18]

108. Notwithstanding Henry Gardner's warning of the dangers of using lead paint in schools and hospitals, National Lead's advertising specifically targeted those institutions. In 1924, National Lead urged schools to paint their classrooms with white lead.

Showing a picture of a teacher with her young students, the text said:

No interior could need paint more than a school room after a session's hard usage by a band of husky young ones .... Get after the school trustees to have each room repainted before pupils come flocking back.

Inform them that flat paint made of Dutch Boy white-lead and flattening oil covers walls and ceilings with a smooth hard coating which permits easy washing of soiled spots. 101c

109. Throughout the twenties, National Lead promoted the use of white lead for hospital interiors by advertising in The Modern Hospital and Hospital Progress, and inviting hospitals to obtain paint advice.<sup>102</sup> They called their tinted paints "the doctor's assistant because of its cheerful coloring and its ability to be washed with soap and water."<sup>103</sup> A 1922 ad featured a children's ward painted with white lead. In 1930, an ad suggested that "every room in a modern hospital deserves a Dutch Boy quality painting job."<sup>104</sup>

110. In 1918, National Lead published an article in the Dutch Boy Painter entitled "How Paint Protects Public Health," in which it claimed that paint and whitewash

102 YSG ex 23.

103 "Clean and Bright Hospital Walls," [Dutch Boy] The Modern Hospital, July 1921, [Adv. 171]; also see, for example, "Color -- the Doctor's Assistant," The Modern Hospital, July 1922 [Adv. 169].

104 Children's ward: YSG ex. 25; "Every Room in a Modern Hospital Deserves a Dutch Boy Quality Painting Job," The Modern Hospital, July 1930.

were "the deadly enemies of tuberculosis" and other germs.<sup>105</sup> A National Lead ad in National Geographic in 1923 declared, "Lead Helps To Guard Your Health," despite the fact that by this time there had been numerous articles and studies that showed that lead was a potent poison, and that lead paint could poison children.<sup>106</sup> In the same year, an article in Dutch Boy Painter entitled "Why Paint Saves Lives" claimed:

If a wall is covered with a good waterproof coat of paint such as produced with white-lead-and-oil, its smooth surface ... need never afford a resting place for germs.

\* \* \* \*

The lesson learned by the modern hospital can well be put into practice in the home. In the kitchen where food is prepared, washable painted surfaces are unquestionably needed; sleeping and living rooms and particularly nurseries require the same protection.

(emphasis supplied).<sup>107</sup>



111. The Sherwin-Williams Company was incorporated in 1884. It produced primarily mixed paints, as opposed to pure white lead, which was mixed with other ingredients by master painters. In the early years of the 20th century, Sherwin-Williams did not manufacture white lead. In 1910 -- at a time after Sherwin-Williams itself had advertised to its agents the poisonousness of lead paint to the inhabitants of houses, and when France had passed legislation banning the interior use of lead paint, and Alice Hamilton, among

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<sup>105</sup> YSG Ex 9.

<sup>106</sup> "Lead Helps to Guard Your Health," ad., National Geographic Magazine, 44 (November 1923); see also Dutch Boy Painter, 1923 "Why Paint Saves Lives," YSG Ex. 14 (advertising the "protection" of lead paint particularly for hospital nurseries).

<sup>107</sup> YSG Ex. 14; see also Dutch Boy Quarterly, 1923 (nursery of [Flower?] Fifth Avenue Hospital painted with white lead) YSG ex. 27; Dutch Boy Quarterly, 1923 (ad headlined "Retarding Baterial Growth"). YSG ex 28.

others, had urged similar restrictions in the United States -- Sherwin-Williams began operating a newly constructed white lead manufacturing plant in Chicago.

112. Although in 1904, Sherwin-Williams had told its agents that lead paint was hazardous to the inhabitants of houses, and, in 1917, had cautioned the War Department about the danger of using lead paint on helmets, in 1922 the company advocated using lead-based paint on children's toys in its publication, "The Home Painting Manual," which stated that "[s]ome of the more elaborate toys -- rocking horses, wagons, etc., may be brightened up now and then with a little S-W Family Paint, SWP . . . as desired."<sup>108</sup> (12)

113. Between 1923 and 1928, Sherwin-Williams, in advertisements in the Saturday Evening Post, in its own magazine, the Chameleon, recommended using white lead-based "SWP House Paint" and "S-W Family Paint" on interior surfaces including walls, woodwork, doors, and ceilings, and on toys. (13) 1089 YSG ¶ 21, 22, 50. One ad, for example, showed a child riding a rocking horse under the headline, "Cousin Susie says her health improved instantly." 1085 YSG Ex. 15. ~~Another showed a woman painting a baby carriage with white lead. [HOL n. 80 -- Peter]~~ (14) A.C. 1089 Adels will 11 Peter to

114. Anaconda Lead Products Company was the predecessor of International Smelting and Refining Company. Both were wholly owned subsidiaries of The Anaconda Company, which eventually was acquired by Atlantic Richfield Corporation ("ARCO"). In 1930, at a time when it knew or should have known of the hazards of white lead paint, Anaconda Lead Products Company began producing white lead at a plant in East Chicago, Indiana. 1089 108 C YNR 1089

115. The Glidden Company did not become a white lead producer until 1924, when it acquired Euston Lead Company. By this date, the paint and pigment industries were well aware of the hazards of white lead paint. Indeed, in the 1920s, Glidden -- which, like Sherwin-Williams, was a major producer of mixed paints -- promoted its zinc-based Zinc-O-Lith paints by arguing that, unlike lead paints, they were non-toxic! <sup>108</sup>YSG (76)

¶ 16.

116. The defendants' ad campaigns helped to create an enduring belief among painters and consumers that the best paint was lead paint -- as National Lead put it in one of its ads, "The highest protective power is found in those paints which contain the most white lead." <sup>108</sup>E [hol n. 79 -- PETER] "LEAD is a lasting metal...", Eagle-Picher proclaimed. "LEAD in paints gives lasting satisfaction ... Is there enough LEAD in your paints?" <sup>108</sup>E [hol n. 82 -- PETER] (76) AC

V.

#### THE LEAD INDUSTRIES ASSOCIATION

117. As early as 1920, the lead industry, organized as the American Institute of Lead Manufacturers, got together to fund medical research of Dr. Joseph Aub at Harvard University on the toxicity of lead, ~~who would become the white lead industry's major~~ ~~apologist and advocate in the medical community.~~ <sup>109</sup> (17) (73) YAK

118. In 1928, as lead's poisonousness was becoming a subject of greater public attention, National Lead Company and St. Joseph's Lead Company formed the Lead

<sup>109</sup> CW 180-81; HOL 14-15 (citing article that says funds came from "National Lead Institute").

1088D YAP  
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Industries Association ("LIA"). All the defendant companies except McGregor Lead

Company, which did not yet exist, were <sup>invited to first</sup> present at the first meeting.<sup>110</sup>

<sup>and organization</sup>  
<sup>of W.P. Fuller, all defendant companies attended the first meeting</sup>  
119. The white lead industry was the most important of the lead

manufacturing industries in the LIA.<sup>111</sup> The industry's concern about what it regarded simply

as negative publicity about lead's harmfulness was one of the reasons for the LIA's creation.

As LIA Secretary Felix Wormser stated to the members a few years later, "if all other

reasons for the establishment of a cooperative organization in the lead industries were to

disappear, the health problem alone would be sufficient warrant for its establishment."<sup>112</sup>

Also among the purposes of the LIA was "to protect the interests of lead whenever

government rules affect the outlet for our products."<sup>113</sup>

120. The LIA was governed by officers and directors representing the

member lead-manufacturing companies. The LIA's operations were conducted by its

Secretary, and his report was regularly presented to the Board of Directors for approval.

Members paid annual dues. The LIA kept its members "posted on the most significant

literature currently published about lead poisoning."<sup>114</sup> As Wormser stated, the question of

<sup>LIA meeting, November 14, 1928</sup>  
<sup>(17)</sup>  
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the lead toxicity "is of fundamental importance to the lead industries ... and we should always be in the forefront so far as medical knowledge of lead is concerned."<sup>115</sup>

121. Virtually from its inception, the LIA was responding to what it termed "undesirable publicity regarding lead poisoning." The response was multi-pronged. Instead of warning the public, the LIA sought to rebut any research findings or other news of lead's toxicity, whether to children or adults. The LIA sponsored its own research, by doctors it knew it could rely on, to demonstrate that lead was harmless, and ignored research and clinical findings suggesting a contrary conclusion. And, all the while, it promoted the use of lead paint, both for interiors and for exteriors.

This section treats the LIA's relationship with the medical community and its "damage control" and lobbying through the early 1950s. The LIA's promotion of white lead pigments is described in section VI. The LIA and industry fight against warning labels is described in section VII, and section VIII deals with the LIA's acknowledgement of the "harrowing" problem of childhood lead poisoning from paint after white lead pigment was no longer used in interior paints, and its attempt to save leaded gasoline by blaming all such poisoning on paint.

A. The LIA And The Medical Community

122. The member companies of the LIA recognized that, on their own, they would have difficulty dealing with the problems of lead poisoning. For example, in the 1940s, E.W. Fasig, General Superintendent of the Lowe Brothers division of Sherwin-Williams, recognized that, even though Lowe Brothers alone had 16 "graduate

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<sup>115</sup> LIA, Board of Directors Meeting, Report of the Secretary, June 15, 1933. ~~{Spriggs}~~  
LIA 00106]

chemists and chemical engineers ... devoted to the study of paint,"<sup>116</sup> research on lead poisoning had to be supported by the whole industry.<sup>117</sup>

123. Continuing the sponsorship of Aub's research, at one of its first meeting the LIA appropriated \$2,000 for so-called "impartial investigation which would show once and for all whether or not lead is detrimental to health." Much of this money went to Dr. Aub,<sup>118</sup> who assisted the LIA's members by his studies purporting to show that a certain amount of lead absorption was harmless, and by his refutations of individual allegations of deaths from lead poisoning. From 1929 through at least 1945, the LIA funded the work of Aub and his colleagues. In many years, this support approached or exceeded 10 percent of the LIA's yearly expenditures. By 1940, Wormser was characterizing Aub's research as "[o]ur medical research at Harvard Medical School."<sup>119</sup>

124. As early as 1926, Aub expressed the view that any child who chewed lead paint was "defective" to begin with,<sup>120</sup> a view he reiterated in response to Byers and Lord's pioneering study, in 1943, which found that childhood lead poisoning affected intellectual development.

<sup>116</sup> Letter from E.W. Fasig to Richard H. Porter, Feb. 8, 1942 [0007-SWP-000030966].

<sup>117</sup> Memorandum from E.W. Fasig to Sherwin-Williams director and Lowe Brothers President Donald A. Kohr, Feb. 24, 1945 [0007-SWP-000030971]; letter from D.A. Kohr to Robert A. Kehoe, M.D., March 2, 1945 [0007-SWP-000030972].

<sup>118</sup> LIA Directors Meeting, May 28, 1930 [LIA 00024-28]; see also, Wormser to Edward McCready, July 7, 1930 [NLI 002374-75].

<sup>119</sup> LIA, Executive Committee Minutes, June 6, 1940; see also LIA Minutes, June 9, 1943 ("Our investigations at Harvard Medical School, under the direction of Dr. Joseph C. Aub") (emphasis added). [Spriggs Brief at 12 and Exh. A-2(a), (b)] For the 10 percent point, see Spriggs Brief at 13, and exhibits cited there.

<sup>120</sup> J.C. Aub et al., Lead Poisoning, p. 70 (1926). [from HOL n. 75]