

BLS and Alice Hamilton: pioneers in industrial health

*In the early years of the century,
BLS contracted for and published studies
of industrial health and safety;
its most active agent was Alice Hamilton,
'special investigator for industrial diseases'*

WILLIAM T. MOYE

In September 1910, Alice Hamilton, chief medical examiner for the Illinois State Commission on Occupational Diseases, was in Brussels attending the International Congress on Occupational Diseases, at which the Belgian delegate dismissed U.S. activities in the field of industrial hygiene with the comment, "Ça n'existe pas [They do not exist]".¹ But that condition had already begun to change, and at the International Congress, Hamilton met Charles P. Neill, Commissioner of Labor, one of the persons primarily responsible for the recent surge in publicity on industrial poisons. Shortly thereafter, Hamilton accepted Neill's proposal that she undertake investigations for the Bureau of Labor, launching a decade of cooperation in which she studied diseases and hazards associated with the lead, explosives, pottery, and dye industries.

Early career

Hamilton was born in New York City in 1869, but was raised in Fort Wayne, IN, one of four sisters with a much younger brother. From her youth, she was determined to be useful. Indeed, at one point, she hoped to become a medical missionary in Persia.² In her activities, she was able to combine her medical work with humanitarian services.

Upon graduation from medical school at the University of Michigan in 1893, she worked at hospitals in Minneapolis and Boston before returning to Michigan for graduate work.

Then she went to Europe for a year of study, followed by a year at Johns Hopkins. In 1897, she accepted a teaching position in Chicago and made the crucial decision to live at Hull House, a settlement house where she found "an intense and humane concern for people, especially for those who had small chance in this world."³ There she found activities that married her research interests with social concerns.

During a typhoid epidemic in 1902, Hamilton surveyed homes in the Hull House district, capturing flies around open, undrained privies. When her tests confirmed the presence of the typhoid bacillus, she published the results of her research in the *Journal of the American Medical Association*, and along with other Hull House residents, urged the Chicago Board of Health to clean up the area.⁴

In 1908, Hamilton published her first article on industrial hygiene in *Charities and The Commons*.⁵ She had to turn to Great Britain and Europe for information on the subject, "as there is so little available in our own country where we are still too much absorbed in the industrial battle to stop and take stock of the killed and wounded."⁶ Later that year, Charles S. Deneen, governor of Illinois, appointed the Illinois Commission on Occupational Diseases—Hamilton and eight men. She served on the commission for about 2 years, resigning to accept the post of medical investigator for the Commission's Survey of Occupational Diseases.

Hamilton later wrote that her visit to European factories in 1911 had been an eye-opener. She had previously thought that U.S. factories provided better working conditions and that American workers enjoyed better health and, therefore, less industrial poisoning. However, after studying the sick-

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ness records and dwellings of English and German workers, she realized that she had found “a far larger number of cases” during her Illinois surveys.⁷

According to Hamilton, when she entered the industrial-hygiene field, “You could have counted the published articles on industrial poisoning on the fingers of one hand.” Employers eager to improve conditions could find but little advice from medical experts. Many supervisors simply relied on a large floating pool of foreigners and a high labor turnover rate to cut exposure time in hazardous trades.⁸

Efforts at the Bureau

Carroll D. Wright, first chief of the Bureau, had commissioned the first Federal report on industrial hygiene and published it in 1903. But the American awakening came later as part of the national push for social and economic reform known as the “Progressive Movement.” Bureau activity in industrial hygiene was further spurred by the assumption of administrative functions under the Federal employees’ compensation act of 1908. Neill placed special emphasis on industrial health and safety issues, and the Bureau participated in and encouraged research on these issues.

In 1909, the Bureau cooperated with the American Association for Labor Legislation in examining the effects of white phosphorus in the production of matches. The subsequent report, published by the Bureau in 1910, spurred the introduction of legislation banning phosphorus matches from interstate commerce and eventually resulted in passage of a law placing a heavy tax on such matches.⁹

In accepting Neill’s proposal to associate with the Bureau of Labor, Hamilton assumed the title of “special investigator for industrial diseases,” producing first “White-Lead Industry in the United States, With an Appendix on the Lead-Oxide Industry.” She investigated 23 of the 25 U.S. factories known to manufacture white lead and discovered 358 specific cases of lead poisoning, 16 of them fatal, occurring between January 1910 and April 1911.¹⁰ She then moved on to study problems of lead poisoning in potteries, tile works, and porcelain enameled sanitary ware, as well as in the painters’ trade.

Royal Meeker, who succeeded Neill as Commissioner, lauded the results of Hamilton’s work, “The studies of lead poisoning, made by the Federal Bureau of Labor Statistics, have induced some of the manufacturers of lead paints, pottery, tile, and storage batteries to eliminate or modify some of the most dangerous processes in their industries which subjected workers to needless hazards from lead poisoning.”¹¹ Meeker wanted the Bureau to become a central clearinghouse, declaring, “This Bureau should be in a position to furnish at any time advice as to the best methods of preventing industrial accidents and occupational diseases.”¹²

Hamilton’s association with the Bureau continued, focusing first on problems in the lead industries, then the rubber industry, the printing trades, the manufacture of explosives,

and the production of aniline dyes. She later wrote of the independence which Meeker allowed her and the support that he gave her: “I look back to my service under him with pleasure and gratitude. He gave me a free hand, but was always ready to help in any difficulty; he never edited my stuff and when nervous manufacturers asked to see it before publication, he would arrange a conference with them, call me in to defend my statements, and stand by me.”¹³

Hamilton may have enjoyed the independence and freedom from red tape, but she suffered from a lack of reliable funding. She was employed by the Bureau on a contract, not a salary basis, selling each study for a negotiated amount. The Bureau itself suffered from limited appropriations, prompting Hamilton to write to her sister in 1914, “They are so poor they cannot make a contract with me for an investigation of rubber, but I mean to do it anyway and trust to their making it in July, the new fiscal year.”¹⁴ Preferring the freedom and variety afforded by her association with the Bureau, she turned down job offers carrying larger salaries but with more restrictions. However, she did supplement her income by writing articles for *The Survey*.¹⁵

Early on, Hamilton developed her techniques of “shoe-leather epidemiology.” Of her experiences in Illinois, she said, “No one method of investigation can be adopted. One must simply grope and catch at anything which offers the least help.” She noted that England and Germany kept official records of workers’ sicknesses. By contrast, “In Illinois, one must simply grope again, and one must carefully check up and control every bit of information one gets.”¹⁶

Hamilton’s biographer wrote of her procedures: thorough investigation of factories, correlation of illness with specific industrial processes, and compilation of medically diagnosed cases of poisoning. Before heading to the field, she learned the technical side of an industry. Then, she would observe all processes, carefully check hospital and dispensary records, and talk to the workers in their homes and union halls—and saloons, if necessary.¹⁷

Hamilton wrote her sister of “the risky things one has to do” as part of an investigation of Arizona copper mines: “climb steep ladders down into black holes, or scramble up through low caves on one’s hands and knees, or pick one’s way over rails laid across a deep dump, or be hauled up a rock that has no foothold.” She was 50 years old at the time.¹⁸

She adamantly defended her work. When one of her early studies was attacked by a company doctor who was also a member of the State board of health as “a striking example of exaggeration, either a false and apparently a malicious and slanderous report, or an erroneous one,” Hamilton wrote her superior at the Bureau of her distress. She supported her findings, naming sources and doctors she had interviewed and listing the establishments she had visited.¹⁹

She readily adopted the Bureau’s tradition of objectivity as the best way to ensure the good will of the business community—and, therefore, entrance to the plants, as no Federal law granted entry and businessmen gave access at

their own discretion. (She later wrote that she could remember only two large factories refusing her entrance.) She made it a point to discuss her observations and criticisms with plant managers in private consultations.

Some plant managers did try to cover up poor conditions, for example, one lead works in the Middle West. Hamilton described that company's village as "the most depressing industrial community I have ever seen." One woman informed her, "We all knew you was coming. They've been cleaning up for you something fierce. Why, in the room where my husband works, they tore out the ceiling because they couldn't cover up the red lead. And a doctor came and looked at all the men and them that's got lead, forty of them, has got to keep to home the day you're there." When Hamilton told the management of her findings, the company admitted the fraud, showed her the doctor's report, and promised permanent improvements, including regular medical examinations for all employees.²⁰

World War I brought new concerns to the fore, and Hamilton surveyed conditions in such war-related industries as munitions and airplane manufacturing. She also studied aniline and other coal-tar dyes, in which U.S. manufacturers were replacing the German products previously imported.²¹

In a 1917 article in *The Survey*, she discussed "a new form of industrial poisoning from the manufacture of airplane wings, which, so it appears, has caused a good deal of trouble in England." The BLS asked her to investigate the kinds of "dope" used to treat the wings of planes manufactured in the United States, and the conditions under which it was applied. She toured 18 factories and reported, "on the whole, my findings were reassuring."²²

Because of the secrecy surrounding munitions plants, Hamilton herself had to discover where the plants were located and what they produced. For example, her search for picric acid led her to the marshes of New Jersey where she followed the chemical's characteristic fumes to their source, or she would spot the orange- and yellow-stained men, known as "canaries," who would then lead her to the site.²³

The Bureau participated in joint projects with agencies in the War Labor Administration of the Department of Labor. For the Working Conditions Service, Hamilton chaired a committee of experts studying health problems arising from industrial poisons. The Bureau also worked with the Woman in Industry Service, teaming with the Public Health Service. Both Meeker and Hamilton participated in an investigation of conditions at Niagara Falls, where plants wanted to work women at night to speed deliveries to the military and other war industries, action prohibited by New York State labor law.

Hamilton worked with the Committee on Industrial Diseases, Poisons, and Explosives organized by the Committee on Labor of the Advisory Commission of the Council of National Defense. She also designed studies for the Committee on Industrial Poisons of the National Research Council's Division of Medicine and Related Services.

She was appalled by "the sight of men sickening and dying in the effort to produce something that would wound or kill other men like themselves."²⁴ However, she chose not to protest the war as conspicuously as she might otherwise so she could keep her job with the Bureau where she could continue to expose hazards and establish protective standards, characterizing her investigations as "a patriotic duty, as a piece of real war work and yet not the destructive side of war but the saving of life."²⁵

After the war, Hamilton wrote, "England and France, facing an emergency infinitely greater than ours, took thought to protect their munitions workers, but we did not."²⁶ As one writer has said, Hamilton cast her lot with those institutions primarily concerned with "workers' welfare, not industrial productivity."²⁷

The later years

The Bureau gradually lost control of Federal occupational health programs to the better financed and equipped Public Health Service. Hamilton, so active during the war years, hesitated to return to the peace-time Bureau, saying, "it will be too depressing to go back to general oblivion again."²⁸

Fortuitously, during her wartime work, she had met David L. Edsall, dean of the Harvard Medical School, who had launched the first degree program in the United States in industrial hygiene. In 1919, Edsall offered Hamilton an appointment to teach industrial medicine, and she became the first woman on the Harvard faculty.

Edsall wrote the president of Harvard that Hamilton's studies were "unquestionably both more extensive and of finer quality than those of anyone else who has done work of this kind in this country."²⁹ Hamilton commented, "going to Harvard is very grand. If one could wear it as a decoration, like the Order of the Garter, I would love it."³⁰

She worked only part time at Harvard, but she was so active on so many fronts that one writer labeled her "the Tinker Bell of industrial medicine."³¹ She contributed articles to the *Journal of Industrial Hygiene*, edited at Harvard. In 1925, she published *Industrial Hygiene in the United States*, the first American textbook in the field, following it in 1934 with *Industrial Toxicology*. Also during that period, several lead companies, at Hamilton's initiative, agreed to fund a 3-year study of lead poisoning to be headed by a Harvard physiologist.³²

Hamilton helped stimulate Federal action leading to two conferences, one on tetra-ethyl lead in 1925 and the other on radium in 1928. She praised the "informal and extra-legal method" of investigation, conference, and agreement between manufacturers and State and Federal health officials as "the only way a quick and effective reform can be brought about in several different States simultaneously." However, she warned, the method worked only on "a new striking danger which lends itself to newspaper publicity"—not old familiar dangers or newer, less spectacular poisons.³³

Therefore, she continued to urge passage of adequate

compensation laws as “the best preventive measure for industrial diseases,” pointing to the powerful influence of insurance companies on employers with excessive numbers of claims because of poor conditions.³⁴

Upon retirement from Harvard in 1935, Hamilton returned to the Department of Labor—whose chief was Frances Perkins, a fellow member of the social reform network. In accepting the part-time job as medical consultant to the Division of Labor Standards, she rejected a full-time offer from the BLS rival, the Public Health Service.

As consultant, she conducted surveys, offered advice, attended conferences, testified at hearings, and brought neglected problems to the Department’s attention. Her most important work during the period involved a study of poisons in the manufacture of viscose rayon. Years earlier, she

had discovered cases of carbon disulphide poisoning arising from the process for vulcanizing rubber. Yet, despite her efforts and considerable European literature on the subject, there had been no systematic investigation in the United States. In the face of industry opposition, Hamilton conducted a survey in Pennsylvania and extended the work to cover nine other States, resulting in *Occupational Poisoning in the Viscose Rayon Industry*, published by the Division of Labor Standards in 1940.³⁵

Alice Hamilton died at her home in Hadlyme, Connecticut, September 22, 1970, a few months before the Occupational Safety and Health Act was signed into law. The previous year, on her 100th birthday, President Richard Nixon had praised her “lasting contributions to the well being of our people and of men and women everywhere.”³⁶ □

—FOOTNOTES—

NOTE: Information on the Bureau of Labor Statistics comes from BLS files and publications, as well as Department of Labor archives.

Information on Alice Hamilton is based largely on two works: Barbara Sicherman, *Alice Hamilton: A Life in Letters* (Cambridge, MA, Harvard University Press, 1984); and Angela Nugent Young, “Interpreting the Dangerous Trades, Workers’ Health in America and the Career of Alice Hamilton, 1910–1935” (Ph.D. dissertation, Department of History, Brown University, 1982).

¹ Alice Hamilton, *Exploring the Dangerous Trades, An Autobiography of Alice Hamilton, M.D.* (Boston, MA, Little, Brown & Co., 1943), p. 128.

² Barbara Sicherman, *Alice Hamilton: A Life in Letters* (Cambridge, MA, Harvard University Press, 1984), p. 33.

³ Elizabeth Shepley Sergeant, “Alice Hamilton, M.D., Crusader for Health in Industry,” *Harper’s Monthly Magazine*, May 1926, p. 767.

⁴ Jane Addams, *Twenty Years at Hull-House* (New York, The Macmillan Co., 1912), pp. 292–98; and Sicherman, *Alice Hamilton: A Life in Letters*, pp. 145–46.

⁵ *Charities and The Commons* was published in New York by the Charity Organization Society, which consisted of social reform and settlement house leaders.

⁶ Alice Hamilton, “Industrial Diseases, With Special Reference to the Trades in Which Women Are Employed,” *Charities and The Commons*, Sept. 5, 1908, p. 655.

⁷ Alice Hamilton, “Nineteen Years in the Poisonous Trades,” *Harper’s Magazine*, October 1929, p. 582.

⁸ *Ibid.*, pp. 582–83; Alice Hamilton, “Occupational Diseases,” *Proceedings, National Conference of Charities and Correction, 1911*, p. 198; and “Forty Years in the Poisonous Trades,” *American Industrial Hygiene Association Quarterly*, March 1948, p. 9.

⁹ John B. Andrews, “Phosphorous Poisoning in the Match Industry in the United States,” *Bulletin of the Bureau of Labor*, January 1910, pp. 31–140.

¹⁰ Alice Hamilton, “The White-Lead Industry in the United States, with an Appendix on the Lead-Oxide Industry,” *Bulletin of the Bureau of Labor*, July 1911, pp. 189–259.

¹¹ Royal Meeker, “The Why and How of Uniform Industrial Accident Statistics for the United States,” *Proceedings, International Association of Industrial Accident Boards and Commissions, 1919*, Bulletin 210 (Bureau of Labor Statistics, 1917), pp. 92–93.

¹² Woodrow Wilson Papers, Library of Congress, Manuscript Division. Royal Meeker to Joseph Tumulty, Feb. 6, 1914.

¹³ Hamilton, *Exploring the Dangerous Trades*, p. 129.

¹⁴ Sicherman, *Alice Hamilton, A Life in Letters*, p. 174; and Young, “Interpreting the Dangerous Trades.”

¹⁴ Sicherman, *Alice Hamilton, A Life in Letters*, pp. 182–83. *The Survey* grew out of the Pittsburgh survey and was published in New York by Survey Associates, Inc., a group of social reform and settlement house leaders.

¹⁶ Hamilton, “Occupational Diseases,” pp. 200–01.

¹⁷ Sicherman, *Alice Hamilton, A Life in Letters*, pp. 166–67.

¹⁸ *Ibid.*, p. 25.

¹⁹ *Ibid.*, pp. 169–72.

²⁰ Hamilton, “Nineteen Years,” pp. 583–84.

²¹ For example, see *Industrial Poisons Used or Produced in the Manufacture of Explosives*, Bulletin 219 (Bureau of Labor Statistics, 1917); and *Industrial Poisoning in Making Coal-Tar Dyes and Dye Intermediates*, Bulletin 280 (Bureau of Labor Statistics, 1921).

²² Alice Hamilton, “Dope Poisoning,” *The Survey*, Nov. 17, 1917, p. 168.

²³ Sicherman, *Alice Hamilton, A Life in Letters*, p. 200.

²⁴ Hamilton, “Nineteen Years,” p. 584.

²⁵ Young, “Interpreting the Dangerous Trades,” p. 96.

²⁶ Hamilton, “Nineteen Years,” p. 584.

²⁷ Young, “Interpreting the Dangerous Trades,” pp. 82–83.

²⁸ *Ibid.*, pp. 42, 84, and 95.

²⁹ Sicherman, *Alice Hamilton, A Life in Letters*, p. 210.

³⁰ *Ibid.*, p. 237.

³¹ Carey P. McCord, “Alice Hamilton,” *Journal of Occupational Medicine*, February 1972, p. 101.

³² Sicherman, *Alice Hamilton, A Life in Letters*, p. 238.

³³ Hamilton, “Nineteen Years,” p. 587; and “Forty Years in the Poisonous Trades,” p. 9.

³⁴ Hamilton comments in *American Federation of Labor Postwar Forum* (Washington, DC, American Federation of Labor, 1944), p. 38.

³⁵ Alice Hamilton, *Occupational Poisoning in the Viscose Rayon Industry*, Bulletin 34 (U.S. Division of Labor Standards, 1940).

³⁶ *The New York Times*, Feb. 28, 1969, p. 35.