

## **APPENDIX B**

### **History of Pollution in Woburn, Massachusetts**

**Chapter 1: The Industrialization of Woburn**

**Chapter 2: Woburn Water Supply History**

**Chapter 3: History of Pollution of the Aberjona River**

**Chapter 4: Tanneries, Piggeries, Municipal Waste,  
and Pesticides**

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## CHAPTER I

### THE INDUSTRIALIZATION OF WOBURN

Woburn, Massachusetts was first settled in 1640 and was incorporated as a town two years later. The town is located ten miles north of Boston and fifteen miles south of Lowell. In 1790 Woburn's population totaled 1,727. By 1860, the population had grown to 6,287. In 1889 Woburn became a city and a year later its population reached 13,449. Its population approached 20,000 in 1935 and today totals roughly 38,000.<sup>1</sup>

Woburn's industrial history can be divided broadly into three periods: the period prior to 1865, the period from 1865 to 1940, and the period from 1940 to the present. The earliest period is best conceived of as the preliminary stage of industrialization when industries such as leather, chemicals and machinery began operating. The middle period corresponds to the rise and decline of the leather industry. The last period involves the diversification of the Woburn industrial base. No longer a one-industry town (i.e. leather), the city's economy expanded to include a range of both high technology firms and more traditional industries such as leather, machinery and chemicals.

#### Industrial History Through the Civil War

Although Woburn's economic base initially rested on agriculture, industry developed in the town, especially after the completion of the Middlesex Canal in 1803. Two tanneries which were crucial to Woburn's later development as a center of leather production originated in this early period. The Dow Tannery (located on Pleasant St., not too far from Horn Pond) was important in Woburn's tannery history from 1814 until its destruction by fire in 1893. The other major pre-Civil War tanning company was begun by Moses Cumming in 1836. Cummings built his tannery on the Mill Pond in the north end of the town. By 1837 there were four tanneries in the town employing seventy-seven hands. The presence of the tanners attracted a constructor of tanning machinery, James Buel, who opened a machine shop in the town in 1860, employing between eight and ten machinists.

During this period, the manufacture of shoes, not leather, was most important to the Woburn economy. In 1850, there were twenty-six boot and shoe factories in the town. Until the 1860s, when leather production outstripped the manufacture of shoes, Woburn competed with the town of Lynn (and Philadelphia) for the dominant share in the nation's shoe market.

In addition to leather and shoe production, the manufacture of chemicals had its start during this period. In 1853, the Woburn Chemical Works, predecessor to the Merrimac Chemical Company, began production near the South Wilmington railroad station in North Woburn. The company would later furnish chemicals used in the manufacture of leather to Woburn tanneries as well as chemicals for dyes used in textile mills located further north on the Merrimack River.<sup>2</sup>

### Industrial History from the Civil War to 1940

From the period after the Civil War until the 1940s, Woburn's industrial history centered on the production of leather and leather-related products such as shoes. Industries, including chemicals, machine-making shops and glue manufacturers, complemented or supported the manufacture of leather. Such firms were responsible for generating most of Woburn's industrial waste during this period.

In 1865, there were twenty-one tanning and currying shops in Woburn, employing 612 men. These firms were mainly located on the south-side of town on or off of Main, Green and Fowle Streets near the Winchester line and in close proximity to Russell Brook. These shops produced products valued at a little over \$2 million. By 1875 the number of shops had declined to 18, employing 808 hands and manufacturing 11,275 sides and 4,000 skins weekly. In 1879 there were twenty-four shops employing 1,288 men and producing 14,800 sides of grain and buff leather on a weekly basis. By 1884 there were twenty-six establishments employing 1,500 men. Their capital stock amounted to \$1.5 million and the value of their product equaled \$4.5 million. During the 1880s it was common for some of the larger establishments, such as the Bryant & King Company, to turn out one thousand sides of leather in a week. Until roughly 1900, these tanneries used the process of bark tanning.<sup>3</sup>

By the twentieth century, the combination of the use of the chrome tanning process with labor-saving machinery, such as the shaving machine and the staking machine, made it possible for tanneries to turn out as many as 10,000 sides of leather per week. In 1915 there were 18 tanneries employing an average of 1,274 hands. They were largely located in the central southern section of town off of Main and Fowle Streets. The value of their products was in excess of \$6 million.<sup>4</sup>

During the 1920s the number of firms in the leather industry fluctuated between 16 and 22, and the number of

employees from about 600 to over 1,500. Most firms were located in the south central part of town. In addition there were several leather firms located in North Woburn on Webster and Maple Streets. A couple of companies were located on Cedar and Salem Streets in close proximity to the Aberjona River. The 22 firms produced a product valued at almost \$8.6 million in 1925. The industry reached its peak production in 1927, with 21 firms producing in excess of \$10 million in products and employing 1,379 hands.<sup>5</sup>

The Woburn leather industry peaked in the years 1927-1928, and then experienced a severe downturn as the national economy plummeted in the late 1920s and early 1930s. In 1929, twenty firms were still operating, employing 1,105 hands, but the value of their product had declined from over \$10 million in 1928 to just over \$7 million in 1929. By 1932, the number of firms had declined to 12, employing 759 men and producing products valued at scarcely over \$3 million. The decline of the industry continued throughout the decade. In 1940 only six firms were left, employing an average of 129 wage earners and producing products valued at under \$400,000.<sup>6</sup>

The presence of the tanning and other industries in Woburn attracted a number of machine shops and foundries. In 1926 there were eight firms of this type, most located in the central southern district of Woburn on Main, Prospect and Fowle Streets in the vicinity of Russell Brook. These firms employed 144 hands and produced roughly \$632,000 worth of products in 1926.<sup>7</sup>

During the period from the end of the Civil War through its acquisition by Monsanto Chemical in 1929, the Merrimac Chemical Company experienced rapid expansion, becoming one of the largest chemical companies in the United States and the largest in New England.<sup>8</sup> From 1858-1890, Merrimac Chemical produced mainly sulfuric acid and related chemicals. Initially, sulfur was utilized in the production of sulfuric acid by the lead chamber method but in the late-nineteenth century pyrite ore was substituted as a sulfur source. After the pyrite ore was burned to produce the sulfuric acid, the pyrite slag was treated to recover copper. Piles of pyrite cinder were accumulated on the property in the expectation that a use for the byproduct would eventually be discovered. Other byproducts or wastes accumulated by Merrimac Chemical in the hope that a future use would develop for them were calcium sulphate, oxide of iron, sulphate of lead, calcium carbonate, bauxite waste mud and other unnamed byproducts.<sup>9</sup>

In 1899, Merrimac purchased a producer of arsenic insecticides, acetic acid and dry colors, the William H. Swift Company of Boston. Between 1899 and 1915, Merrimac became the leading producer in the U. S. of arsenic insecticides. In 1890, Merrimac became a large producer of aluminum chloride and was the first American plant to manufacture hydrate by the Bayer Process.

Merrimac organized the New England Manufacturing Company in 1915 to produce organic chemicals, including phenol, benzene, picric acid and toluene. Its plant was in North Woburn adjacent to the Merrimac facility. During World War I both Merrimac and the New England Manufacturing Company produced picric acid, trinitrotoluol and trinitrophenol (TNT). Light oils from coal tar distillation were also refined at the Merrimac plant during these years. Paint grinding also took place on the site.

#### Woburn Industry: 1940 to the present

The period after 1940 saw the transformation of Woburn from the status of a two-industry town to a much more diversified industrial base. The evidence for the period is scattered and fragmented, but there clearly was a diversity of operations located in the town. The leather industry did not completely disappear from Woburn during this period, although the number of firms was drastically curtailed. In 1947 five leather and leather related firms were operating in the town including, Murray Leather Company, Woburn Japanning Company, John Riley Company, Tanners Degreasing Company and Woburn Degreasing Company. Two of these firms were located in the south central part of town; two were located in east or southeast Woburn; and one was located in the town's western part.

There was also a significant amount of metal working done in Woburn at this date. Fourteen machine shops, foundries and tin shops were located there, eleven of which were found in south central Woburn, two in east Woburn and one in North Woburn.

While the tannery industry had declined in Woburn after World War II, the chemical industry actually underwent expansion. Among the chemical companies identified in Woburn in 1947 were P. H. Revell Company which bottled household chemicals, International Minerals and Chemical Corp. which

manufactured fertilizers, Atlantic Gelatin and Independent Tallow. The Consolidated Chemical Company was located on the old Merrimac site in North Woburn and operated primarily an animal hide glue manufacturing plant. The Revell plant was located in south central Woburn, Atlantic Gelatin and Independent Tallow in southeast Woburn, and International Minerals in North Woburn. 10

By 1969, the industrial base had expanded from 74 to 120 firms. The number of leather and leather related industries remained at five, three located in southeast Woburn, one in the south central part of the town and one in North Woburn. Atlantic Gelatin and Independent Tallow were still operating, while Consolidated Chemical Company had been acquired by Stauffer Chemicals. In addition, there was a plastics manufacturing company operating in the south central part of the town. The number of machine shops, foundries and tin shops remained the same, holding at fourteen. But, by this point in time the Woburn industrial base was diversifying, hosting a range of service industries and durable goods manufacturers such as General Motors and W. R. Grace. 11

In 1985, there were over 135 manufacturing firms in Woburn, of a wide variety. As part of the Route 128 region the town has its share of high technology firms. In addition, there are several machine and machine related shops including American Shoe Machinery, Circle T & D Corp., Custom Machine Inc., Lufkin Corporation, John H. McCafferty, North Woburn Machine Co., Inc., Ober Industries, Inc., Pell Engineering, Inc., Prospect Tool & Die Company, Inc., Wells Machine Company, Inc., and Woburn Machine Company. Two companies, John J. Riley Company and Braude Brothers Tanning Corporation, are still involved in leather manufacturing. Several firms are also involved in chemical and chemically related industries including Continental Chemical & Coatings, producing solvent and water based adhesives as well as wood preservatives; Fuller System, Inc., which produces greenhouse pesticides; Hy-Trous Corporation manufacturing fertilizers; New England Resins & Pigment producing plastic and paint raw materials; and Northeastern Ammonia Company, Inc., which is involved in the production of anhydrous ammonia and related equipment. 12

## FOOTNOTES

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1. William Lee Raymond, "Community Survey of Woburn, Massachusetts", 1936.
  2. James Heaton, "Woburn--A Leather City", Current Affairs April 16, 1923; Samuel Drake, History of Middlesex County; Woburn Daily Times October 21, 1976; Arthur Gardner, "Report of Investigation to Substantiate the Date of 1853 as that of the Establishment of the Woburn Chemical Company...", ms. in Woburn Public Library.
  3. Heaton; Woburn Board of Trade, Woburn; An Historical and Descriptive Sketch of the Town... Woburn, 1885; Woburn Directory: 1868, 1874, 1877, 1883, 1891, 1895, 1899.
  4. Shoe and Leather Reporter, May 20, 1920; Massachusetts Department of Labor and Industries, Division of Statistics, Census of Manufactures--City of Woburn 1915; Woburn Directory 1906, 1913, 1915.
  5. Census of Manufacturers 1925, 1927; Woburn Directory 1925.
  6. Census of Manufacturers 1927-1940.
  7. Census of Manufacturers, 1926; Woburn Directory 1925.
  8. Unless otherwise cited, all of the following information on the Merrimac Company comes from Stauffer Chemical Co., Woburn Environmental Studies, Phase 1 Rpt., V. 1., "Environmental Assessment", April, 1983, pp. I-1-9.
  9. Merrimac Chemical Company, Manufacturers of Chemicals, Boston, 1928, p. 79.
  10. Sanborn Maps, Woburn, 1947.
  11. "Insurance Maps of Woburn", published by Sanborn Map Company, 1969.
  12. George D. Hall, Directory of Massachusetts Manufacturers, 1985-1986.