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Joanne Abel Goldman. *Building New York's Sewers: Developing Mechanisms of Urban Management.* West Lafayette, Ind.: Purdue University Press, 1997. xvii + 228 pp. $29.95 (cloth), ISBN 978-1-55753-095-0.

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Despite the importance of sanitary waste disposal to modern urban life, surprisingly little has been written on the history of sewers in America's largest city. Indeed, New York City's growth and development is reflected in how waste products, from human excrement and household garbage to industrial refuse, have been discharged into the natural environment. Joanne Abel Goldman's *Building New York's Sewers* begins to fill this historiographic void by merging classic works on public health with public works history to interpret a variety of primary documents. As a result, Goldman's work is neither an extensive review of medical advances or a recital of engineering feats, rather it is an examination of how infrastructure policy is made.

From the beginning, Goldman casts the story of New York's sewers within a framework designed to explore the origins of contemporary attitudes on proper public service delivery. Her main concern is to uncover the political, economic, social, and intellectual context within which nineteenth-century sewage disposal policy was created. More often than not, Goldman hits her mark squarely. However, there are several noticeable omissions in her analysis. Surprisingly, although refreshingly, *Building New York's Sewers* spends little time discussing sewers. Those readers desiring a comprehensive accounting and/or chronology of city sewage installations and improvements will be disappointed. For the rest of us, Goldman's biggest shortfall is that she fails to explore fully several key observations on the role of professional engineers, and that she ends her story too soon. In fact, Goldman's focus on the development of mechanisms for sewage management means that her analysis stops in the 1870s; a full sixty years before the city implemented anything close to an integrated and comprehensive sewage treatment system. As such, Goldman fails to examine the actual difficulties inherent in carrying out policies which arose from the mechanisms she documents. In a larger sense, therefore, the overall complexity of waste management in New York City is diluted.

Goldman succeeds in her stated goal to explore "the process by which New York City came to construct a sewer system to discharge wastewater during the nineteenth century" (p. 2). She skillfully links the creation of such a system to transformations in the city's demography, physical environment, political structure, and economy. Prior to the mid-nineteenth century, a well-planned and integrated sewage infrastructure was impossible, given the city's reliance on the private sector for waste disposal and the control property owners and politicians had over sewer construction. Rather than public health and engineering concerns determining when, where, and how to build sewers, local property owners themselves often initiated and financed construction projects. And the Common Council, ever sensitive to the financial burden of these constituents, did not require new sewers to be connected together to form a city-wide "system." As a result, Goldman notes, affluent neighborhoods had better drainage than poorer ones, since sewage construction reflected the larger class fragmentation of mid-nineteenth-century New York.

In contrast, Goldman documents an important exception to the class based delivery of municipal services; namely the creation of the Croton Aqueduct and subsequent city-wide water supply in the 1830s and 1840s. With the Croton, water was introduced into the poorest and most densely populated portions of Manhattan first. Unlike the city's sewers, government officials, under the careful tutelage of engineers, conceived and built the Croton as an integrated system designed to benefit all New Yorkers. In many respects, it is the planning, funding, construction, and operation of the Croton, rather than sewers in particular, which becomes the centerpiece of Goldman's analysis. Why, then, title the book *Building New York's Sewers*? Part of the answer lies in the fact that without the Croton, a wastewater discharge system would have been extremely difficult, if not impossible.

Although much of the Croton story already has been documented in the secondary literature[1], Goldman em-

phasizes the aqueduct system in order to illuminate the origins of familiar mechanisms of modern urban management. For Goldman, the Croton is the archetype of all rational public works projects in New York City. Yet, as she makes clear, it took approximately thirty years after the completion of the Croton for sewer construction to follow similar "sound" engineering and management principles. Eventually, an adequate wastewater drainage system emerged in the city, but only after intervention by state politicians, doctors, and engineers.

As with the construction of the Croton Aqueduct, Goldman covers familiar ground in her discussion of how Albany attempted to save the city from itself through various charter revisions and institutions in the 1840s and 1850s (e.g. the metropolitan police force). Her review of the medical community's activism on behalf of the city's sanitary condition also resonates well with the works of noted public health historians John Duffy and Charles Rosenberg.[2] Unfortunately, her analysis of engineering professionals is not as thorough.

Overall, Goldman presents engineers as rather monolithic. In fact, she relegates historiographic debates over the development and nature of the engineering profession largely to one bibliographic citation. Instead, she notes the parallels between the burgeoning engineering and medical professions and concludes, with little direct evidence, that engineers enjoyed the same public notoriety and support as did the physicians who campaigned vigorously for a healthier city. Goldman may be right in asserting that the general public began to accept engineers as the proper managers of infrastructure development by mid-century, yet her argument needs additional documentation; preferably from sources outside that of engineers. Even her most powerful piece of evidence–the state's 1865 turnover of jurisdiction over New York City's sewers to engineers in the Croton Aqueduct Department–is portrayed largely as the result of political circumstance rather than wide-spread public understanding of engineering principles.

Ironically, Goldman does a better job with manual and semi-skilled laborers in her third chapter, "Building the Sewers." Here she illuminates a variety of potentially dry primary documents to explain why a disjointed wastewater system emerged in the first half of the nineteenth century. Her description of the contract labor system is a nice example of how to blend social, political, and technological history. However, additional analysis is needed for the years after 1865. Goldman writes as if all is well with the city's sewage system once engineers assumed control over the design and operation of wastewater drainage. In many respects, though, the story of sanitary improvements had only just begun.

Goldman contends that by the 1870s, the interests of city politicians and sanitary engineers merged to create a public works department which, in effect, resulted in "a new administrative tier to city management that was removed from electoral politics" (170). For Goldman, the mechanisms of management were now in place to construct a comprehensive and integrated city-wide sewer system. Why did sewage disposal, then, remain political and perhaps the greatest source of environmental pollution in New York City well into the twentieth century? For example, pollution of the city's harbor from sewage became such a major public concern that in 1906 Mayor George McClellan appointed a special Metropolitan Sewerage Commission to investigate and make recommendations on how to improve water quality. The commission's findings, released between 1909 and 1914, generated a great deal of interest and political discourse on how best to improve the city's antiquated sewage system.[3] Yet by 1928, the city's sewers still discharged an estimated one billion gallons of untreated raw sewage into the harbor each day.[4] Surely such a system was not considered by sanitary engineers in the 1920s as either comprehensive or state-of-the-art? How then, did New York City fall so far behind in terms of acceptable sanitary standards?

By neglecting to take her story past the creation of a management system, Goldman misses out on these subsequent shortcomings in the design and operation of New York City's sewers. While her larger argument on policy formation may be essentially correct, it does not explore fully policy implementation. Certainly this would enhance any analysis of proper public service delivery.

Notes

[1]. Nelson Manfred Blake, *Water for the Cities* (New York: Syracuse University Press, 1956); Larry D. Lankton, *The "Practicable" Engineer: John B. Jervis and the Old Croton Aqueduct*, Essays in Public Works History, no. 5 (Chicago: Public Works Historical Society, September 1977); Eugene Moehring, *Public Works and the Patterns of Urban Real Estate Growth in Manhattan, 1835-1894* (New York: Arno Press, 1981).

[2]. John Duffy, *A History of Public Health in New York City, 1625-1866* (New York: Russell Sage, 1968); John Duffy, *The Sanitarians: A History of American Public Health* (Urbana: University of Ilinois Press, 1990); Charles E. Rosenberg, *The Cholera Years: The United States in 1832, 1849, and 1866* (Chicago: The University of Chicago Press, 1962).

[3]. Among the commission's more substantial reports are: New York (N.Y.) Metropolitan Sewrage Comission, *Digest of data collected before the year 1908 relating to the sanitary condition of New York harbor* (New York: M.B. Brown Press, 1909); New York (N.Y.) Metropolitan Sewerage Comission, *Present Sanitary Condition of New York Harbor and the Degree of Cleanness Which is Necessary and Sufficient for the Water* (New York: Wynkoop, Hallenbeck, Crawford Co., 1912); New York (City) Metropolitan Sewerage Comission *Main Drainage and Sewage Disposal Works Proposed for New York City, Reports of Experts and Data Relating to the Harbor* (New York: Wynkoop, Hallenbeck, Crawford Co., 1914).

[4]. For a review of the Metropolitan Sewerage Commission's findings and state of sewage treatment in the 1920s and early 1930s see George A, Soper, "Fouled Harbor Makes Sewage Problems Acute," *The New York Times*, 26 May 1929, sec. 10, p. 4; and Soper, "New York City at Last Moves to End Pollution of its Harbor," *The New York Times*, 12 July 1931, sec. 9, p. 4. Information on the discharge of sewage in 1928 is from Virginia Pope, "Modern Sewage Plants are Needed in New York," *The New York Times*, 17 July 1928, sec. 9, p. 6.

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