EFFLUENT AMERICA

CITIES, INDUSTRY, ENERGY, AND THE ENVIRONMENT

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the inner cities. Early suburbs suffered because they often were too far removed from needed services; later they suffered because they were too close to inner-city pollution.[30]

The Search for Remedies

The aggregate effects of air, water, and land pollution, though not yet considered a crisis, nevertheless inspired a search for remedies in the late nineteenth and early twentieth centuries. Environmental problems usually were treated as localized occurrences. Sometimes, however, especially in the case of energy use and water pollution, the source of the problem appeared broader. The dilemma was how to reconcile economic benefits from industrial expansion with threats to the health and well-being of Americans and the degradation of the environment.

The lines of this dilemma were not so clearly drawn. Few reliable tests existed to measure pollutants. Theory to place pollution in a modern biological and chemical context was still in a rudimentary stage, and standards of environmental purity had yet to be established.

Despite these limitations, and despite the significant economic achievements of industrialization, a search for remedies took several forms: civic protests, education programs, court action, regulation, and legislation. With some exceptions, reform grew out of initiatives from environmental "consumers"—the receptors of the pollution or their agents (government)—rather than from "producers"—the generators of the pollution. Without cooperation from polluters and the recognition that environmental impact was a consequence of doing business, by century's end achievements in pollution abatement were often limited to setting precedents rather than providing solutions.

Civic Protest

The earliest protests were responses to irritations, such as bad-tasting water, billowing smoke, putrefying garbage, or noisy machinery. The concept of pollution as "nuisance" dominated these early complaints (and antedate the industrial period). "Nuisance" was a popular contemporary term, applied arbitrarily to almost any environmental problem. "The great majority of the dwellers in our cities have not, heretofore, taken any active personal interest in the sanitary condition of their respective towns," said sanitarian John S. Billings. "They may grumble occasionally when some nuisance is forced on their notice, but as a rule, they look on the city as a sort of hotel, with

the coalition of antismoke groups in St. Louis in 1911. In several quarters the call for education prevailed because supporters believed that promoting efficiency and fuel economy would stimulate *additional* economic growth.[35] In Chicago the Society for the Prevention of Smoke—founded by local businessmen in 1892—launched an educational campaign directed at the city's downtown business community; its message was that reducing smoke would remove an unwanted nuisance, minimize a costly economic problem, and improve the city's image. The goal was to achieve voluntary compliance by encouraging businessmen to use new boiler designs and to retrofit existing boilers with smoke consuming devices. However, business interests in Chicago ultimately responded to smoke pollution in diverse ways, ranging from indifference to support for regulation.[36]

Similar programs were launched in other cities to help eradicate various forms of pollution. New York's Society for the Suppression of Unnecessary Noise allied itself with the press in a campaign meant to inform the public about the tyranny of noise and to urge the writing of anti-noise ordinances. One result was the establishment of quiet zones around hospitals and schools.[37] Education programs that were not coordinated with more coercive measures failed to produce many immediate or tangible results.

A potentially more effective, if not more guileful, use of the education strategy was proselytizing among the young with the hope that changing the behavior of children would have long-term benefits. A good example was the Juvenile Street Cleaning League, initiated by New York Street Cleaning Commissioner George E. Waring. Noting the participation of children in the local Civic History Club and other organizations, Waring concluded, "It seemed possible to enlist their interest in the cleanliness of the city."[38] He hoped the children, especially the offspring of immigrants, would act as eyes, ears, and noses for the department in uncovering unsanitary conditions and would influence their parents. Like other middle-class reformers, Waring mistakenly viewed the working classes as the primary cause of indiscriminate waste disposal. In 1896 neighborhood leagues popped up throughout the city. There were 75 leagues and 5,000 participants in New York by 1899. Other cities, including Philadelphia, Brooklyn, Pittsburgh, Utica, and Denver, established their own leagues.

The Courts

Some contemporaries believed that self-regulation and the proper application of technology were practical remedies as long as all parties were aware of

the nature and extent of pollution problems and their potential effects on business efficiency and economy. Others put their faith in the coercive power of government to contain the crass impulses of would-be polluters. Still others assumed that the courts would apply traditional principles of common law to protect property rights and public safety.

Throughout the nineteenth century, common law doctrine failed to meet the demand for protective regulation of the environment, but in the application of nuisance law, it developed a legal form for addressing liability. Case law and statutes dealing with nuisances were not developed primarily to address environmental issues, however, and thus legal action responded to a problem after the fact. No common law doctrine is wider in scope than nuisance law, but its application to environmental issues has been unsystematic.[39]

In the nineteenth century, economic considerations shaped the application of nuisance law in cases affecting the environment. Some legal scholars said that judges deliberately structured tort doctrine to favor industrial interests. Morton Horwitz added that nineteenth-century tort law provided an indirect economic subsidy to entrepreneurial interests, but that nuisance law was slow to respond to the demand for economic subsidization.[40]

There was, however, an increase in actions for injunctions against industrial nuisances as early as 1837. Between 1871 and 1916, the number of private suits for nuisance injunctions increased at a rate comparable to the impressive economic growth of the period. Denial of injunctive relief persisted, however.[41]

The spread of smoke pollution in a period of substantial economic growth is a good example of the application of nuisance law. The difficulty in addressing the problem was that smoke was a physical manifestation of economic progress in those cities most dependent on industries of which it was a by-product. Because few courts were willing or able to determine the costs of smoke in hard economic terms, the legal response to air pollution at the time was relatively weak.[42]

While the argument that the courts tended to protect entrepreneurs from nuisance actions is compelling, it can be overstated. The application of existing legal remedies provided legitimate redress for plaintiffs against industrial defendants. By defining liability—even narrowly—the courts left room for successful actions against industrial polluters.[43] In some states—New York, Pennsylvania, and New Jersey—victims of pollution won relief much more frequently than they were denied it, especially after 1871.[44]

With respect to municipal and industrial wastes, a shift toward the plain-

tiffs is not apparent. Courts in the nineteenth century had no conclusive evidence that inorganic industrial waste posed a hazard to water supplies or that land disposal was a major threat to groundwater. Furthermore, the introduction of municipal sewage into running water was not seen as a public nuisance. The courts dealt with nuisance cases as they arose rather than addressing them as part of a broad environmental problem. The courts generally held polluters liable for damage caused by disposal in streams, but the legal system established few prohibitions against the act of polluting itself.[45]

Government Regulation

A major link between conservation and energy production was the disposition of mineral resources on public lands. Debate over coal leasing during the Progressive Era involved questions of resource exploitation and control over the use of public lands.[46] The controversy over waterpower also went to the heart of wise use, an issue central to exploiting energy sources. By the early twentieth century, America's waterways had come to be viewed as multipurpose resources, and one of their uses was the generation of hydroelectric power. Private companies had already gobbled up western waterpower sites on most public lands, however. Not until the Water Power Act (1920) did the federal government assert the principle of public regulation of hydroelectric power, articulating a clearer sense of waterpower development on navigable streams.[47] With respect to hydropower and the leasing of lands with mineral assets, the issue was controlling access to and allocation of resources in the public domain.

By World War I, the federal government had begun to restrain the unlimited exploitation of the public domain, but it did not broaden the wise use concept to include those resources under private control. State officials in particular explored remedies for potential oil depletion, but wasteful practices continued. By the late 1920s the realities of a glutted market had encouraged the oil industry to develop an appreciation for conservation. Discoveries in California and Oklahoma meant that known reserves of crude had greatly outstripped demand. The net result was incredibly low prices, a trend that worsened in the 1930s. Only after wanton exploitation of fields in east Texas and Oklahoma in the early 1930s was mandatory prorationing of wells enacted. At that point some order returned to the fields. State agencies like the Texas Railroad Commission exercised greater influence over production controls than did federal policies.[48]

If the broadening of the wise use concept for energy sources was slow in coming, plans for protecting the environment proceeded at a glacial pace. The federal government's approach was sporadic and particularistic, reflecting the general perception that these were local problems best dealt with by ordinances or other local action. Congress passed few laws that dealt with environmental implications of energy. As late as 1955 government-sponsored environmental programs represented only 3 percent of the federal budget, with no financial support for pollution abatement.[49]

Despite the lack of federal leadership, industrial cities paid some attention to the environmental implications of energy exploitation and use after the turn of the century. The greatest success of smoke abatement proponents was the implementation of tougher local laws in almost every city by 1912. Nevertheless, local authorities were unwilling to curb industrial development, and they enforced the ordinances selectively. During World War I, when unrestricted production became a patriotic duty, smoke abatement fell on hard times. Smoke pollution did not abate until the use of coal diminished in the 1920s.[50]

Pollution from oil production and transportation also remained mostly a local issue. The drilling and refining of oil-polluted local areas only rarely attracted attention from oil companies or state governments. The federal government did step in, establishing a precedent—albeit a modest and limited one—for combating oil pollution when it passed the Oil Pollution Control Act in 1924. Contamination of water from tanker discharges, rather than seepage problems on land, attracted primary attention because polluting waterways and coastal areas impinged on the interests of commercial fishermen and resort owners. The oil industry initially treated the call to end polluting practices with apprehension. However, the American Petroleum Institute, the industry's major lobbying body, soon used its own data to reduce criticism of the industry and to support further investigations of oil pollution.

As secretary of commerce, Herbert Hoover used his office to protect American fisheries, despite his additional responsibility to commercial shippers. While Hoover and his supporters preferred a comprehensive law to regulate land-based polluters as well as ships, divergent economic and political interests in Congress resulted in a much weaker bill. The 1924 act had weak enforcement provisions and dealt only with dumping fuel at sea by oil-burning vessels. It was, nevertheless, the first attempt to deal with the issue on a national scale.[51]

In the nineteenth century American municipalities promulgated an array of ordinances regulating activities associated with health and sanitation, including the construction and emptying of privy vaults and cesspools, garbage collection, sewerage development, and water supply. By the 1880s many cities had passed statutes forcing "noxious" manufacturers to the outskirts, but few cities had specific regulations regarding disposal of manufacturing wastes. If they were dealt with at all, these wastes were considered under existing nuisance provisions.[52]

Municipal statutes and ordinances did little to move beyond the courts in refining environmental liability. Municipalities sometimes found themselves as defendants, especially when the dumping of sewage threatened a riparian owner. In addition, the diversion of industrial wastes to municipal treatment facilities transferred legal responsibility for stream pollution to the cities.[53]

While municipal ordinances infrequently confronted the broad problems associated with land and water pollution, the establishment of regulatory bodies in some cities decreased pollution. The Chicago Drainage Districts attempted to prevent pollution in already badly contaminated watercourses. The Milwaukee Sewerage Commission was empowered to regulate the character and quantity of industrial waste discharged into public sewer systems.[54]

The states were the centers of action for new legislation to control stream pollution, which remained the major focus of concern over the disposal of municipal and industrial wastes through the mid-twentieth century. In general sanitation laws had increased dramatically on the state level by the end of the century. This trend was particularly strong in the Northeast and lagged in the South. The first state legislation to control stream pollution was written in 1878 in Massachusetts and gave the state board of health the power to control river pollution caused by industrial wastes. In 1915 only eighteen state boards of health had divisions of sanitary engineering; all but four states had established such divisions by 1927.[55] By World War I states had established boards and commissions expressly designed to regulate water pollution. These new bodies often were given expanded power over industrial as well as municipal pollution.[56]

Results were often disappointing, however. The regulations contained inconsistencies, and enforcement was lax. A survey conducted by the American Water Works Association in 1921 stated that only five states granted broad authority to its pollution agencies, and in nearly all cases enforcement was restricted by the lack of appropriations. Some experts believed that conditions

had improved by the late 1920s, citing the Ohio State Department of Health as an example of an effective regulator. However, the early laws clearly accommodated the interests of industry. Some laws failed to provide penalties for infringements, and most laws exempted specific industries, specific streams, or specific wastes, such as petroleum, wood wastes, acids, and alkalis.[57]

Under the terms of state legislation the individual or company responsible for a nuisance could be criminally liable for violating a law prohibiting pollution by industrial wastes. In general, however, state boards preferred cooperation rather than placing themselves in conflict with industry. State agencies often justified cooperation on the grounds that drastic control by court action would hinder economic growth and might result in incomplete investigations of actual stream requirements and of the applicability of treatment processes. Among the boards' functions was providing industries with technical information and survey data to keep them abreast of current disposal and recycling methods.[58] Trade associations, such as the American Petroleum Institute and the Pulp and Paper Association, were involved in projects for pollution control or waste utilization, even though their motives could be suspect.

Another important issue in the evolution of environmental liability at the state level was interstate conflict. On several occasions one state brought action against another state (or industry in that state) to check air and water pollution.[59] It did not take long to recognize that such chronic interstate rivalry could affect other areas. One possible solution was interstate agreements or compacts to control or abate pollution.[60] The interstate cooperative approach had practical benefits for dealing with stream pollution, but it was an imperfect tool. The interstate compacts did not serve as regional plans to abate pollution, since they were drawn only to deal with the level of discharge into water. They also did little to further the definition of environmental liability, working instead to solve practical problems by avoiding litigation.

To a limited degree federal regulation in the period sought to accomplish—for public health and water pollution at least—what state and court actions could not. There was, however, no overriding national policy for dealing with pollution. In 1912 the federal government began to give assistance to the states in evaluating water pollution through the Public Health Service's Stream Investigation Station in Cincinnati. In 1938 a loan and grant program for the states was set up through the PHS's Division of Water Pollution Control. Some concern about hazardous substances was noted in several acts, especially the Food, Drug and Cosmetic Act of 1938, which limited the amount of additives

problem of hazardous waste and modern concepts of environmental liability. First, the acknowledgment that collection and disposal were municipal responsibilities in the late nineteenth century made refuse a public or community issue. Second, the waste problem was transformed from a nuisance, or inconvenience, into a health hazard, largely through the efforts of public health advocates and sanitarians. Third, by relinquishing major responsibility for environmental sanitation—due to advocacy of bacteriology as a solution to communicable diseases—public health officials made way for the perception of refuse as an engineering issue. While waste remained a health hazard, proper collection and disposal appeared achievable through the application of technology. Fourth, the growing interest in the sanitary landfill as an alternative to incineration and reduction created the impetus for land disposal as a panacea for the increasing generation of solid wastes.

Industrial Wastes

By the 1940s industrial wastes were viewed as a problem primarily affecting water purity and complicating the process of sewage treatment. While public health officials relinquished responsibility over collection and disposal of refuse in this period, they paid strict attention to waterborne disease. As a consequence, concern over water pollution, especially in the late nineteenth and early twentieth centuries, focused primarily on bacterial levels in the water, rather than on the impact of industrial pollutants. Proper sewerage, therefore, was considered the most significant factor in reducing water pollution.[29]

Some forms of industrial waste caused concern, but as Marshall O. Leighton, a hydrographer with the U.S. Geological Survey, noted in 1906, "Industrial wastes do not normally contain the germs of disease. Therefore, from a purely pathogenic standpoint, their relation to sanitation is remote."[30] In some cases, industrial waste was considered a germicide, which, when added to water, would inhibit the putrescibility of organic material. From a much broader perspective, industrial waste was regarded by many as simply an evil necessary for the sake of economic growth.

By the 1920s industrial pollutants were being taken more seriously as new studies pointed to the immense quantities entering the nation's watercourses and as a better understanding of their composition became known. Among the problems identified by contemporary sanitary engineers were the hindrance in the proper operation of water and sewage treatment facilities; the consumption of oxygen, which reduced the dilution power of running water;

fish kills; and the increase in taste and odor problems with drinking water. A 1923 report indicated that no fewer than 248 water supplies throughout the United States and Canada had been affected by industrial wastes.[31]

The amount and variety of trade wastes dumped into watercourses and on land suggest an industrial waste problem of many facets. By 1940 most urban Americans were drinking treated water, but sewage treatment lagged far behind. This was particularly significant because a common method of disposing of liquid industrial wastes—without paying for the cost of treatment—was discharging them into municipal sewerage systems. One study estimated that the wastes of approximately 30 million Americans "and even greater millions of population equivalents of wastes from industries" continued to be discharged without treatment into oceans, large rivers, and lakes. A great deal of faith was placed in the capacity of a watercourse for self-purification through the dilution of wastes and the movement of the water.[32]

While sewage treatment improved somewhat by the 1930s, the debate continued over whether the disposal needs of industry—and the role of industry as an integral part of the community—granted it the right to use the municipal sewer system.[33] A U.S. Public Health Service survey concluded, "The organic pollution contributed by industry is about equal to that contributed by the entire population."[34] In many cases the industrial pollution in a city may have equaled or greatly exceeded the domestic pollution.[35]

Contemporaries had experienced problems with trade wastes for many decades, especially organic materials from food processing, tanning operations, textile manufacturing, and sawmilling. Accelerating industrialization, however, introduced many new forms of waste from operations such as iron and steel production, metal finishing, chemical production, coal mining, petroleum refining, and electrical power generation. According to geographer Craig E. Colten:

> The ten-fold growth of the organic chemical industry since 1940 has led many investigators to discount the significance of wastes produced before then. They assume that few hazardous materials were discarded and that the small quantities that were produced do not warrant serious consideration. Yet, estimates of industrial waste production in 1935 illustrate that chemical producers, primary metal firms, and tanneries emitted substantial totals of hazardous wastes.[36]

Colten estimated that chemical, primary metal, and tanned leather goods manufacturers were responsible for approximately 5.7 million tons of hazardous wastes. "Among the wastes released in the mid-1930s were a variety of

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42. Leighton, "Industrial Wastes and Their Sanitary Significance," 32–33; Hervey J. Skinner, "Waste Problems in the Pulp and Paper Industry," *Industrial and Engineering Chemistry* 31 (November 1939): 1331–32. See also Ernest W. Steel, "Present Practice in Industrial Waste Treatment," *Public Works* 61 (September 1930): 21–22, 76–80; "The Pollution of Streams by Manufactories," *Engineering Magazine* 22 (February 1902): 774–75; Powell, "Industrial-Waste Problems and Their Correction," 359–64; Donaldson, "Industrial Wastes in Relation to Water Supplies," 193–98; "New Sewage Plants Check Stream Pollution," 15.

43. Colten, "Hazardous Waste Sites Before 1940," 2.

44. Ibid., 13. See also Colten and Breen, *Historical Industrial Waste Disposal Practices in Winnebago County*, x, 5; Colten, *Industrial Wastes in the Calumet Area*, 21, 24–25, 51; Besselievre, "The Disposal of Industrial Chemical Waste," 517; Tarr, "The Search for the Ultimate Sink," 530–31.

45. Tarr, "Industrial Wastes and Public Health," 1060.

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