



Box Shop (above) and village street (below) at E.I. DuPont's Smith's Mills property in Standish, 1923. In its heyday during WWI, Smith's Mills employed hundreds of men and produced 40,000 feet of lumber daily to support the overseas war effort. The Portland Water District, calling Smith's Mills "one of the worst dangers of pollution about the lake," purchased the property for \$90,000 in 1923, and subsequently razed or relocated every building on the property, returning it to a forested state. *Images courtesy of the Portland Water District.*

MAINE'S CONTESTED WATERFRONT: THE PROJECT TO REMAKE SEBAGO LAKE'S LOWER BAY, 1906-1930

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Throughout the nation's history, few resources have been considered as ubiquitous as water. The issue of who controls the use of water, however, has seldom been straight forward. This was no less true in the Progressive Era, when many growing urban areas significantly altered their water infrastructure to meet increased demands. When debate arose over water use, these municipalities often relied on the relatively new authority of scientific knowledge, particularly in the area of public health and safety. In this article, the author describes how the Portland Water District was able to conserve Sebago Lake's Lower Bay as a clean, reliable source of drinking water for Portland, Maine. A native of Portland, the author is a graduate of Brown University, where he earned his A.B. in history and geology-biology. He is currently a Ph.D. candidate and Irving and Rose Crown Fellow at Brandeis University, where he studies North American environmental history.

IN THE winter of 1923, as snow swirled around buildings at Smith's Mills, an atmosphere of bleakness and malaise was settling upon those few residents who remained at this once bustling manufacturing village in the town of Standish, Maine. In its heyday during World War I, this 90-acre tract of lakeside land owned by the E.I. DuPont Powder Company had been a veritable boom town. The company had employed hundreds of men there, producing 40,000 feet of lumber daily to be fashioned into boxes and crates for shipping explosives to the allied armies overseas. Workers and their families had lived on site, and there was even a small school house. Just five years later, with few families remaining, the village faced imminent closure and demolition. A Boston reporter observed that "there is an atmosphere of desolation that is appalling to those who have lived here for years, even before the coming of the Duponts. These men walk about the little community mournfully, shaking their heads over the passing of the little village."¹

While business had slowed since the end of the war, Smith's Mills

was being shuttered once and for all as a result of its recent purchase by the Portland Water District, which paid DuPont \$90,000 to take over and dismantle the entire village. The District, a public institution that drew water from Sebago Lake to serve the nearby city of Portland, would later argue that Smith's Mills was "one of the worst dangers of pollution about the lake," and was located too close to its intake in the lake's Lower Bay, threatening the health and safety of urban water consumers.² The property "had long been a source of danger," argued the District, "owing to a system of water sewage emptying into cesspools, the overflow from which found its way into Sticky River, and thence into the lake."³ Ultimately, the Water District razed or relocated every building on the property. Today, a "Smith Mill Road" still exists in the town of Standish, but all traces of the former village are otherwise gone.

The Smith's Mills demolition was perhaps the most dramatic event in a much larger, coordinated effort by the Portland Water District to safeguard its water supply. In a period of roughly twenty years spanning the 1910s and 1920s, the Water District acquired miles of shoreline through eminent domain and purchases from willing sellers, condemned and knocked down cottages, restricted access to the waterfront, and prohibited swimming within two miles of its intake. In totality, these actions would dramatically remake the face of the Lower Bay, transforming a once thriving center of industry and a growing destination for summer rusticators into what would essentially become an off-limits wilderness in the southern corner of the lake.

How was it that the nascent Portland Water District so successfully transformed the prevailing model of land and water use over such a short period of time, effectively putting an end to most industrial, residential and recreational uses of Sebago Lake's Lower Bay? At the center of this transformation was a small group of prominent scientists and engineers who advised the District in its early years. These acclaimed experts from around the Northeast sought to use the best science of the day to protect public health. They were convinced that the only way to truly safeguard the water supply was to remove pollution at its source rather than filter and remediate water that had already been contaminated. This vision of "pure water as furnished by nature" ultimately drove the leadership of the Portland Water District to adopt its sweeping conservation program, including its acquisition of shorefront parcels such as Smith's Mills.

These scientific recommendations, however, could never have been implemented without a favorable political and financial framework. In a

new age of mastery over germs, the public trusted the advice of expert sanitary engineers.⁴ Moreover, as a later debate in the 1920s would make clear, conservation measures could be implemented at a much lower cost than strategies to remediate polluted water.

Despite its successes, the Portland Water District's dramatic reorientation of the Lower Bay did not come without controversy, especially the ire of residents of the rural town of Standish who were most impacted by changes to land and water use. These public debates brought into focus a series of substantive questions with environmental, political and even moral dimensions. How should a limited natural resource like the waters and shorefront of Sebago Lake be fairly allocated? When should the public good trump the rights of companies and private individuals to use the lake? And what rights should a small rural community like Standish relinquish to serve the needs of a larger urban population? Sebago Lake's disputed shorefront and waters in the early twentieth century are part of a larger historical narrative of contested natural resources that continues to resonate in environmental debates today.

From Private to Public Hands: The Creation of the Portland Water District

The first piece of the puzzle in explaining the success of the Portland Water District's conservation program at Sebago Lake might be easy to overlook: the fact that there was a Portland Water District in the first place, a public agency with the power to seize private land by eminent domain. That such an organization existed in the 1910s and 1920s was far from a given. In fact, for nearly four decades from 1869 to 1908, Portlanders had been supplied with drinking water from Sebago Lake, courtesy of the *privately* owned Portland Water Company. After the great fire of 1866 had destroyed much of the city, Portland leaders were convinced that they needed a modern water works to combat destructive fires, but there was much disagreement over who should build and operate it. Ultimately, the city's financial troubles (a result of debt from the Civil War years combined with the devastation of the fire) compelled city leaders to seek private, rather than public financing. A group of investors calling itself the Portland Water Company received a charter from the state of Maine and raised funds for this ambitious project. The company selected Sebago Lake as its source, a natural reservoir that was favorably situated just sixteen miles northwest of Portland.⁵ Carved out by glacial action over 14,000 years ago, the lake was the second largest in the state, with over 47 square miles of water surface and 105 miles of shoreline. It



The Portland Water District's laboratory on Casco Street in Portland, 1919. Using scientific authority to protect public health was a key factor in the creation of the public Portland Water District. This state-of-the-art facility, first opened in 1913 on Kennebec Street, was specifically created in response to a typhoid fever outbreak in Portland the previous year. The laboratory moved to the Casco Street location in 1915. *Image courtesy of the Portland Water District.*

was also the deepest in the state, at 316 feet. While some critics remained concerned about private ownership of a common resource like water, many were assuaged by a provision in the Portland Water Company's charter that would allow the city to purchase the company through eminent domain at any point after six years.⁶

Activists in Portland would push in earnest for such a purchase in 1906, as the Portland Water Company sought to renew its latest twenty-year contract with the city. The timing of these negotiations was favorable for supporters of a public water district. Maine's Supreme Court had recently ruled that financing for municipal water districts was exempt from a constitutionally imposed debt ceiling on cities and towns, thus enabling a takeover for Portland that had been impossible earlier.⁷ The new Portland Water District was ultimately approved by voters in Portland and South Portland in May 1907, and the final purchase price (established later through legal proceedings) was set at \$1.68 million, with the assumption of an additional \$2.1 million in debt. The new organization formally began operations in 1908.⁸

The campaign for a public water district was modeled on Progress-

sive Era thinking that was heavily critical of corporate monopolies. Proponents argued that water rates could be lowered substantially if the water works were no longer required to pay dividends to shareholders. In addition, they maintained that water was a public resource and that private shareholders should not be profiting from such a critical public necessity. Similar debates over public water occurred in cities around the country during this period and were extensively referenced in Portland newspapers. In fact, while just 53 percent of water works in the U.S. were publicly owned in 1896, that number mushroomed to 70 percent by 1924; Portland thus fit into a larger national narrative of growing public ownership.⁹

While issues of water quality and safety were only mentioned occasionally in the debate leading up to the takeover, these health-related arguments were important components of the case for a water district. When they were invoked, they also tended to espouse Progressive Era condemnation of corporate monopolies while embracing public ownership of natural resources. These concerns were summarized by a newly formed Special Committee on Water District, which reported to the Portland City Council in 1907. The “continued protection of the public health is of more importance than any monetary consideration,” stated the committee’s report, which went on to argue that “a board of trustees working solely for the public good is far more likely to take steps to procure and maintain protection to the water supply than will any private company whose principal object is to secure good returns for the stockholders.” The committee also pointed to the urgency and timeliness of the issue, contending that “the number of cottages on Sebago Lake is rapidly increasing every year” and that the “single point of health protection regardless of how good the supply may have been in the past, is sufficient alone to justify the public in assuming all the possibilities of paying a large sum to obtain these water plants.”¹⁰

Lewis A. Goudy, a local activist who spoke on behalf of Portland at hearings in the capital city of Augusta, also raised the issue of public health to forge support in the state legislature for a public water works. According to a newspaper account, he told a legislative committee that “he had never known the [Portland Water Company] to take measures for preserving the quality of the water before—if it had, it had been in the night time when no one was watching.” Furthermore, “he said that the typhoid outbreak in Scranton, Pa., might be duplicated in Portland unless the people take things into their own hands.”¹¹ At the dawn of the 1900s, the specter of infectious disease outbreaks—which could now de-

finitively be linked by bacteriologists to water-borne pathogens—remained an ever-present concern for Portlanders as it was for urbanites throughout America.

As a result of these worries, measures to protect water quality were drafted into the original charter of the Portland Water District. The document, as approved by state legislators (and later ratified by local voters), included a provision for the new District to take land by eminent domain for a long list of purposes, including “for preserving the purity of the water and water shed.”¹² The timing of the public takeover in 1908 enabled the Water District to step in and exercise these powers of eminent domain before rampant development of the Lower Bay shoreline would make the purchase of shorefront land much less economically viable. The creation of a public agency thus provided a framework for protecting land along the Lower Bay, an undertaking that would have been far more difficult for the privately owned Portland Water Company to accomplish.

The District Turns to Science

Once established as a public entity, the Portland Water District quickly sought to implement policies based on the best practices of the day in sanitary engineering, policies that would ultimately shape the District’s conservation efforts at Sebago Lake and would remake the face of the Lower Bay. The movement for urban sanitary reform had first begun in England in the 1830s, and while it was less than a century old by 1908, it had made major strides in improving the health and welfare of urban dwellers, both in Europe and in America. Public health reformers in the early to mid-nineteenth century tended to associate disease with filth and poor living conditions, and so the usual recommendations of municipal sanitary surveys focused on cleanliness—for example, implementing street cleaning and garbage collection, building municipal water and sewer systems, and empowering local health departments. By 1880, an overwhelming 94 percent of American cities had a board of health, a health commissioner, or a health officer.¹³

Clean water remained a continual focal point of these municipal sanitation efforts in the mid-nineteenth century. By 1854, London physician John Snow had been able to empirically prove that cholera—one of the great infectious disease scourges of the era—was spread through a contaminated water supply. But the exact means of transmission for infectious disease remained a mystery for another couple of

decades until a series of critical discoveries supplanted the early “filth theory” of disease with its modern replacement: “germ theory.” Beginning in the late 1870s, scientists in the new discipline of bacteriology made a number of rapid discoveries, identifying the microorganisms that caused some of the worst communicable diseases of the era, including cholera, gonorrhea, tuberculosis, typhoid fever, and scarlet fever.¹⁴

While the study of bacteriology impacted a variety of public health efforts—such as vaccination—much of its most significant work focused on the quality of drinking water. A key breakthrough for water testing came in the 1890s when George Fuller and George Whipple, two scientists trained at the Massachusetts Institute of Technology, discovered that coliform bacteria in water indicate the presence of human or animal feces—and hence the potential for other deadly microorganisms. This discovery prompted state boards of health to implement new testing regimens. Historian John Cumbler maintains that by the turn of the century, “the work of the bacteriologists finally allowed state health officials to have some success in determining if the water that cities or towns were using was safe to drink.”¹⁵ In addition to testing water quality, new technologies were also emerging to treat polluted water. Filtration was first tested at scale beginning in the late 1880s in Massachusetts, and modern techniques in chlorination were developed around 1910.¹⁶

Important scientific advancements in the field of bacteriology ultimately led to the “professionalization” of public health in the United States, a phenomenon that was also impacting other disciplines during the Progressive Era. New bacteriological techniques, which were highly effective at combating disease but required an unprecedented degree of technical expertise, shifted the “responsibility for health from the layman to the trained scientist” beginning around the 1880s, according to historian Barbara Rosenkrantz. “As both prevention and cure of disease were removed from the jurisdiction of enlightened common sense, new appeals for sanitary controls were phrased in terms of dependence upon qualified experts—the engineer, the chemist, and the biologist.”¹⁷

The aims and successes of the new, scientifically-based public health efforts led to a new era of optimism among both the public and the scientists themselves. Such optimism was articulated by Whipple in his 1917 work *State Sanitation*. “The ‘new public health’ movement is now in full swing,” he wrote, “and its momentum ought some day to carry it to the point where communicable diseases have been practically obliterated from the earth. Nothing in all history has done so much to reduce the suffering and misery of mankind as the curative and preventive arts which have grown out of the science of bacteriology.”¹⁸ This new era of

optimism, which elevated the importance of professional scientists, was a national phenomenon with critical local consequences for Portland. The rise of science as a primary tool to manage public health coincided with the founding and early decades of the Portland Water District and ultimately drove the course of the District's conservation efforts in the Lower Bay.

At least five prominent engineers and scientists were retained by the District at its founding, tasked with analyzing the water quality and pollution levels of Sebago Lake. The purpose of their investigation was twofold: to determine if pollution at the lake might be cited to reduce the purchase value of the Portland Water Company, and to make recommendations on how best to maintain water purity and prevent the spread of waterborne illness. Portland's geographic location—only about one hundred miles north of Boston—allowed the Water District to tap into the expertise of some of the country's most distinguished sanitary engineers. Massachusetts had long been considered a national leader in the field of public health and water safety. The commonwealth had established the nation's first state board of health in 1869.¹⁹ And the Lawrence Experiment Station, established in 1886 along the polluted Merrimack River in Lawrence, became America's leading research institution on water purification.²⁰

George Whipple, among the Massachusetts scientists retained by the Portland Water District, was at the time of the appointment a professor of sanitary engineering at Harvard University, chairman of the commission of sanitary engineering at the Massachusetts Board of Health, and a principal of the sanitary engineering firm Hazen & Whipple. The District also engaged the services of Whipple's colleague, Allen Hazen, who was the author of numerous textbooks on sanitary engineering and had designed or implemented many of the largest filtration plants then in operation in the United States, including the first experimental plant in Lawrence. In addition to Whipple and Hazen, the District called upon the services of Leonard Metcalf of the Massachusetts firm Metcalf & Eddy. Metcalf served as consulting engineer for the Boston metropolitan water supply and would later serve as consulting engineer for the Portland Water District from 1912 until his death in 1925. The District also engaged the services of William P. Mason, a professor at Rensselaer Polytechnic Institute in Troy, New York, who was a recognized authority in the field of sanitation and the author of several textbooks on the topic.²¹

If the District's trustees were privately hoping that these scientific experts might find fault with the water supply so as to lower the pur-



Temporary hypochlorite plant at Hinkley Brook in Standish, 1916. The plant was deployed to chemically treat water from the polluted tributary, before it entered the lake near the District's intake. *Image courtesy of the Portland Water District.*

chase price of the Portland Water Company, they were out of luck. According to a later newspaper report, "after a most exhaustive examination covering several months the trustees of the District were forced to admit on the advice of Hazen & Whipple that the water was in first class condition, although several possible sources of pollution were discovered."²² Professor Mason testified that the water was "at least as good and in many cases better than filtered water for this reason, that bacteriologically and chemically it compares favorably [and] shows equally as good," and that "pure water as furnished by nature is always better than an equally pure furnished by art [*i.e.*, through a filtration plant], because art might possibly fail in its operation sometime."²³ While lauding the overall purity of the water, the experts did, however, make several recommendations on how to improve its quality. These steps included acquiring land around the intake, prohibiting swimming near the intake, and policing the watershed to prevent anyone from breaking sanitation laws. The trustees wasted little time in implementing these recommendations, commencing land acquisition by eminent domain in 1911 and successfully advocating for passage by the state legislature of a two-mile no bathing zone around the intake in 1913.²⁴ This zoning remains in effect to this day.²⁵

Even before it took these longer-term steps, however, the District

followed the advice of its sanitation experts by identifying and removing the most obvious sources of pollution in the Lower Bay. As early as 1908, Dr. William S. Thompson of Standish, who served as the District's local inspector, met with landowners and the District's trustees to identify and remedy sources of pollution. "The inhabitants about the lake, as a whole, seem to appreciate conditions and to be willing to adopt reasonable regulations to protect the water supply," wrote the trustees.²⁶ In these early years, the Portland Water District also worked with steamboat operators to install sanitary toilets on their boats, and with the Maine Central Railroad to do the same at Sebago Lake Station on the southern shore of the Lower Bay. It also prevented trains from discharging waste from onboard toilets within a certain distance from the lake.²⁷

Acquiring Land in the Lower Bay

With regard to land acquisition for the purpose of protecting water supplies, the Portland Water District was not forging new ground. Rather, there were many precedents for doing this throughout New England between the Civil War and World War I, often by public utilities that sought to protect reservoirs from industrial and agricultural pollution.²⁸ Following these established precedents and acting upon the advice of its scientists, the Portland Water District took measures to preserve the quality of its watershed. The trustees wrote in their 1911 annual report that increased development from summer cottages along Sebago's shoreline had "been the cause of considerable anxiety to the Trustees." When "a tract of land near the intake, and comprising nearly a mile of water front, was plotted into cottage lots and offered for sale, the Trustees decided that prompt action was necessary." Using the powers of eminent domain provided under its charter, the District condemned large sections of land around the intake that year—comprising nearly two miles of waterfront—and declared that "additional land should be taken from time to time as fast as the income of the District will permit and the necessity of the situation may require."²⁹ This was exactly the approach taken, as the District continued its acquisition program over the next two decades through a combination of eminent domain and purchases from willing sellers.

One of the more colorful stories of the District's land acquisition program took place in 1922, involving a "colony of Thespians" who owned summer homes on Indian Island in the Lower Bay. For these New

York actors, the lake represented a bucolic retreat from the heat and bustle of summer in the city and a place to relax between hectic seasons on Broadway. They spent their days, according to the Portland Sunday Telegram, "basking beneath the Maine pine trees, darting in swift motor boats over the sapphire waters of the lake, smoking, and fishing, and loafing, and seeping in the Sebago sunshine."³⁰

But the "modern Eden" created by these vacationers would be very short-lived. Indian Island, the home of the actor colony, was situated within the two-mile no bathing zone, which the Maine state legislature had enacted in 1913. The colony's fate quickly began to unravel in the summer of 1922 when islander Malcolm F. Williams, a stage and film actor from New York City, was caught illegally swimming in the water in front of his home by a warden of the Portland Water District on a routine motorboat patrol (these patrols had been inaugurated in 1917). Williams' wife, Florence Reed, a renowned stage and motion picture star, was reportedly sitting on the shore at the time and watched as her husband was arrested after a verbal altercation with the warden. The Water District pressed charges, and Williams was forced to appear in municipal court in Portland to face accusations of illegally bathing in the lake. The actor argued that he was within his legal rights to take a "duck" into the water outside of his own home, and pleaded not guilty. But the court ruled against him and levied a \$20 fine (the maximum allowed by law), plus court costs.³¹

The Portland Water District did not stop there. Two weeks later, the District filed papers with the county commissioner to condemn and seize the cottage of Williams and Reed, along with the two other cottages that were part of the actors' colony. The flap generated a great deal of attention locally. "It is the talk of the general store, the barber shop, the ice cream parlor," wrote one reporter. "The big world outside may wag on indifferent, but Sebago Lake wants to know whether Malcolm Williams and Florence Reed are to lose their property or not."³² Ultimately, the District prevailed. Calling the cottages on Indian Island "prolific sources of danger," and arguing that the island's "inhabitants were not honestly observing the regulations of the District," the trustees took swift and decisive action in eminent domain proceedings. By the following year, the District controlled the entire island and the cottages were subsequently destroyed.³³

Not all of the land acquired by the Portland Water District had previously been used for private residential purposes, as at Indian Island in Sebago's Lower Bay, or for commercial purposes, as at Smith's Mills. In



Summer cottage on Indian Island owned by Broadway actors Florence Reed and Malcolm Williams, 1923, shortly before its demolition. The cottage, located within the Portland Water District's two-mile no bathing zone in Sebago Lake's Lower Bay, was condemned and destroyed by the District after Williams was caught illegally swimming in the lake. *Image courtesy of the Portland Water District.*

August 1925, the District signed a long-term lease with the Maine Central Railroad for a waterfront parcel that had previously been used as public picnic grounds. The District then proceeded to shut down the site, erecting a fence to keep out trespassers. Lamented one newspaper writer: "the popular picnic grounds located near the Maine Central Railroad station at Sebago Lake, the scene from time immemorable of happy picnic parties and field days of various organizations, is lost to the public forever."³⁴

In the late 1910s the Portland Water District began a program of planting trees on the various properties it had acquired. For example, when the Smith's Mills property was purchased and torn down in the early 1920s, seedling spruce was planted there to restore the property to a forested state.³⁵ The idea of implementing forest management practices on watershed lands was not unique to Sebago Lake. Forestry activities on public watershed parcels in New England dated back to the late 1800s, although it was not until the decade following World War I that large-scale projects were undertaken to plant and manage forests on municipal watershed land throughout the region. Coniferous species

like pine and spruce were the preferred choice of foresters. Not only would they reduce soil erosion and prevent leaf litter from entering the water supply, but they were also more commercially viable than other species.³⁶ In addition to acquiring land and engaging in forestry, the Portland Water District also fenced off much of its property near the water intake to prevent unauthorized access by campers and other trespassers. Describing a new one and one-half mile galvanized wire fence built in 1913, the trustees wrote that it protected "the property taken by the District from encroachment by picnic and automobile parties which have heretofore had ready access to the shore of the lake and been a source of danger."³⁷

Concurrent with its efforts to acquire land, and in keeping with the recommendations of its scientists, the Portland Water District was also taking important steps to test water. These efforts were hastened when a typhoid fever outbreak struck Portland in the summer of 1912. A report created that year by Professor E.B. Phelps of the Massachusetts Institute of Technology and presented to the Portland Board of Health called into question the safety of the water supply and recommended that it be chlorinated, a relatively new technology.³⁸ In response to Phelps' report and to public concerns over the typhoid fever outbreak, the District again turned to the assistance of scientific experts. It hired Professor James M. Caird of Troy, New York to create a state-of-the-art laboratory for the bacteriological and chemical testing of the city's water supply. The laboratory, located in the Water District's building on Kennebec Street in Portland, formally began operation in February 1913 and was run on a day-to-day basis by one of Caird's charges, a Rensselaer Polytechnic Institute graduate.³⁹ Caird concluded that the typhoid fever outbreak was not triggered by a polluted water supply; he would later blame contaminated milk. Nonetheless, under his supervision, the District did eventually adopt the advice of Professor Phelps, constructing a hypochlorite plant at the water intake in 1913 to treat water before it was piped to consumers. The plant was initially used seasonally or as conditions warranted.⁴⁰ The District also constructed hypochlorite plants that would remove pathogens from two contaminated brooks that entered the lake near the intake.⁴¹

The myriad steps taken by the Portland Water District to protect water quality in the Lower Bay yielded notable results. Average bacterial counts per cubic centimeter of lake water fell dramatically, from 38 in 1908; to 26 from 1913 to 1918; to 11 from 1918 to 1922; and finally, in 1923, to only five.⁴² Using empirical, scientific data, the Water District

demonstrated to the public that its conservation program was a great success. Over this time, the trustees and leadership of the District continually referred to the reduction in bacteria counts in order to justify their continued actions in protecting the Lower Bay from pollution. Of the District's annual reports from 1908 to 1928, each one addressed the issue of "sanitation" in the brief Trustees' Report at the front of the document, underscoring the seriousness with which the trustees treated the issue of water quality and safety. Moreover, the actions outlined in these reports—such as land acquisition in the Lower Bay, chlorination, and new testing regimens—were almost entirely guided by recommendations from the District's scientific experts, according to the trustees. Both in action and rhetoric, the District consistently sought to implement solutions that were perceived to be based on sound science.

Confronting Rural Opposition

Disputes over water rights have frequently arisen between urban areas that consume large amounts of water and rural regions that provide water resources to consumers in far-off metropolises. In nearby Massachusetts, for example, the capture and transport of water in the western part of the state for use by urban communities in the east created lasting hostility between the two regions. In the Bay State, urban and rural interest groups contested not only the rights to limited supplies of water, but also the locations of reservoirs themselves when farmland was flooded to create the Wachusett Reservoir in the 1890s. When that supply proved inadequate, entire town centers and four cemeteries were deluged to create the larger Quabbin Reservoir in the 1930s, arousing great distress in the affected communities.⁴³ Opposition from rural interests was present but more muted in the case of Sebago Lake because the water supply of Sebago was naturally plentiful. In order to serve the city of Portland, no significant quantity of water needed to be diverted from other agricultural or industrial uses, and no new dams would be built to flood local farmland.

Nonetheless, the far-reaching conservation efforts of the Portland Water District did provoke negative sentiments from Standish residents who objected to what they described as the District's heavy-handed tactics in reorienting water rights on the lake. Early on, the Portland Water District was forced to confront disgruntled individuals in the town of Standish who owned shorefront land on the Lower Bay. Landowners felt that the District was not fairly compensating them for seized property.



The Higgins lot on Sebago Lake's Lower Bay, 1919. In an effort to safeguard water quality, the Portland Water District condemned the property, which consisted of 350 cottage lots, in 1915. The property's heirs demanded \$40,000 in compensation, but the County Commissioners awarded them just \$18,000. Following the condemnation, the Portland Water District planted white pines to reforest the parcel. *Image courtesy of the Portland Water District.*

One such dispute played itself out in 1915 after the District condemned the Higgins estate, which consisted of 350 cottage lots and a mile of lake-front. The Water District had offered to pay \$12,000, based on estimates from its real estate appraisers, but the heirs to the property demanded \$40,000 and even produced a series of witnesses, residents of Standish who claimed that the value of the land was between \$25,000 and \$40,000. Ultimately, the County Commissioners settled on a value of \$18,000, far less than what the heirs had wanted.⁴⁴

By the mid-1920s, these individual cases had evolved into a much more organized and vocal opposition, likely catalyzed by a series of high-profile events, including the Indian Island Thespian colony condemnation in 1922, the dismantling of the DuPont Company's Smith's Mills in 1923, and the shuttering of the lakeside picnic grounds in 1925. These events gave some locals the impression that the Portland Water District was shutting down the town for business, stunting development and limiting the town's property tax base. Resident James Perrigo wrote that "under the policy pursued by the Water District, real estate values

are rapidly depreciating, the tourist business is much less than a few years ago, business in general is depressed and working men have to seek employment elsewhere. A representative of the Water District has stated the intention of doing away with the village entirely sometime in the future.”⁴⁵ Furthermore, Perrigo mocked the closure of the picnic grounds, writing that “leasing the picnic ground may possibly prevent a scrap of paper being blown into the lake, which is about the only source of contamination there.” And he urged the state legislature to revoke the District’s powers of eminent domain, calling them “dangerous.”⁴⁶

By 1925, after the Portland Water District had moved its intake farther from shore and into deeper water, many lakefront landowners in Standish, particularly those whose shorefront homes still remained within the two-mile no bathing zone, argued that the Water District should abandon its policy of land acquisition and move to lift the two-mile restriction. These residents believed that the District ought to instead construct a filtration plant, which they claimed would achieve the desired effect of safe drinking water without any burden being placed on the local community. In August 1925, local resident Philip Webb Davis, M.D., suggested that “boating, bathing, and fishing” might once again “be unrestricted on the Lake” with the proper diversion of sewage as well as a new filtration plant. With the new intake submerged in deeper water one quarter mile from shore, Webb argued that the danger of contamination from bathers near the shore was now “a practical impossibility.”⁴⁷ While proponents of a filtration plant may have been motivated by issues pertaining to use of the Lower Bay, their rhetoric, like the Water District’s, was largely grounded in scientific authority and emphasized the safety of Portland’s water supply.

The fears of Standish residents that the policies of the Portland Water District were crimping development in the town were likely fueled by a significant depopulation during the 1920s. While the town’s population had grown from 1,504 in 1900 to 1,735 by 1920, it fell sharply to 1,317 by 1930, a 24 percent drop over ten years and the steepest percentage decline in the town’s recorded history. The loss of 418 residents might be largely attributed to the closure of Smith’s Mills, where approximately 250 people once lived. This depopulation certainly had a major impact on the fabric of the town and caused some residents to blame the Portland Water District for the town’s woes. It should be noted that during the same period (1920 to 1930), none of the other five towns abutting the lake experienced similar population loss. Meanwhile, at the receiving end of the Water District’s pipes, Portland’s population increased

by two percent to 70,810, South Portland's by 50 percent to 13,840, and neighboring Westbrook's by 14 percent to 10,807.⁴⁸

While Standish residents made impassioned pleas for constructing a filtration plant and lifting restrictions in the Lower Bay, the Portland Water District countered with scientific arguments of its own for why a filtration plant was not advisable, stating that "the water supply is better protected and is in better condition today than it was eighteen years ago, and that no necessity exists for a filtration plant provided the present policy of protecting the supply is continued."⁴⁹ The filtration plant became a major issue in the 1926 election for Water District trustee in Portland. Dr. Edwin W. Gehring, seeking election as the ostensibly pro-filtration candidate (although he refused to take a definitive, public stand on the issue), contended that a medical doctor should be represented on the board of trustees to ensure that public health issues, like filtration, would be adequately considered. Incumbent William Blake, however, argued against a filtration plant, insisting that he, too, would protect the quality of the water by using sound scientific principles. One of Blake's campaign ads read, "he stands for protecting the water supply under the direction of expert sanitary engineers, as at present, rather than allowing it to be polluted and then go to the expense of purifying it."⁵⁰ Blake, of course, was echoing the ethos that the Water District had been embracing for years: that preserving the purity of the water supply in the lake should be the preferred option for protecting public health, rather than remediating polluted water. Blake, a longtime incumbent, handily won re-election. What is notable, however, is that both candidates claimed scientific authority to justify their positions, consistent with the belief that public health administration should rest in the hands of qualified experts. Neither candidate disputed that the best science of the day should be employed to protect the public. They simply disagreed on what that "best science" was.

Scientific arguments, however, did not function in a vacuum in the case of the filtration debate. The advice of the District's scientists to protect the watershed also aligned conveniently with fiscal imperatives. Acquiring land was expensive, but it was certainly within the financial capacity of the District. Approximately \$200,000 was spent on land acquisitions between 1911 and 1925. During that time, the District brought in annual revenues of between \$300,000 and \$500,000, so the land purchases could be accomplished without significant rate increases for customers. This was especially true because the purchases were spread out over a number of years. A filtration plant, however, would be

a different story. In 1925, the District estimated the expense of building a new plant at \$1,000,000, with annual expenses of \$100,000 per year (half from debt service and half from operating costs). This would have required a 20 percent increase in water rates according to the District's own estimates, which the public would have been unlikely to tolerate.⁵¹ In this particular case, the advice of the District's scientists aligned with that of its financial planners, and the construction of a filtration plant was deemed both costly and unnecessary.

Debates over filtration of Portland's water supply mirrored those occurring to the south in Massachusetts. The first significant filtration debate in the Bay State had occurred in the 1890s, as Boston and surrounding cities and towns sought to quench the area's growing thirst for water. The demand for water in urban areas had outpaced the supply available from Boston's earliest public water project, Lake Cochituate. When the State Board of Health was asked to investigate the prospects for creating the area's first metropolitan water district, the board's chief engineer, Frederic P. Stearns, investigated a number of different options for augmenting the region's water supply. Stearns focused primarily on two proposals: the first was to dam the waters of the Nashua River at the town of Clinton, creating a large reservoir of pure water. The second proposal was to draw from the polluted Merrimack River, which would require filtration.⁵² This was a relatively new technology at the time, with modern, scalable filtration techniques pioneered at the Lawrence Experiment Station in Massachusetts starting in 1888.⁵³

Despite the early successes of filtration, Stearns had recommended using the cleaner waters of the Nashua over the polluted waters of the Merrimack. In the Board's 1895 report, Stearns and his colleagues acknowledged that "waters as polluted as those of the Merrimack can be effectually filtered and rendered safe for domestic use." But they also argued that "in a few instances at least, inefficient administration or inherent defects of construction have allowed disease germs to pass through filters which were assumed, by good authority, to be a sufficient protection," and Stearns successfully convinced Massachusetts policy makers that damming the Nashua was a wiser approach.⁵⁴

One of the key reasons for rejecting filtration of the Merrimack River in the 1890s was that filtration was relatively new and not yet proven on a large scale. However, this had changed by the 1920s, when debate began in earnest over whether to dam the Swift River farther west to form what would later be called the Quabbin Reservoir. But here again, state policy makers selected the clean waters of the Swift over the

option of filtering the Merrimack. The plan to tap the waters of the Swift was strongly advocated by X. Henry Goodnough, Stearns' successor at the Metropolitan Water District, who used much the same rhetoric as Stearns to support capturing pure water over filtering polluted water.⁵⁵

The aversion in Massachusetts to filtration seems to be a regional preference and was not universally shared around the United States. By 1920, some 20 million urban dwellers in the U.S. drank filtered water. This represented consumers in a third of all American cities with populations greater than 2,500.⁵⁶ Historian Fern Nesson credits the discomfort with filtration in Massachusetts to the enormous influence that Frederic Stearns exerted over the next generation of sanitary engineers in the state.⁵⁷ Within a small community of elite sanitary engineers in the region, many of the same scientists and engineers who advised the Metropolitan Water District in Massachusetts also advised the Portland Water District, and all reached the same conclusion that Stearns had come to in his 1895 report: that a pure, unpolluted water supply was the best defense against possible contamination for consumers at the tap.

The debate surrounding construction of the Quabbin also shared interesting parallels with Sebago Lake in terms of the ways in which filtration pitted urban interests against rural ones. In particular, political leaders in western Massachusetts demanded that filtered sources of water in the eastern part of the state be considered.⁵⁸ Much like the situation at Sebago, filtration offered the promise for rural residents to maintain control over the natural resources in their communities. However, these arguments made little impact for the affected towns in western Massachusetts, which for the most part were politically weak, poorly organized, and unable to combat the power of metropolitan Boston. Similarly, inhabitants of Standish were unable to amass the political clout to oppose the lakeside conservation efforts of the Portland Water District. Standish residents complained about the Water District's policies to lawmakers in Augusta, but made no headway.⁵⁹ Public officials, and the public at large, believed the health and safety concerns of a hundred thousand water users outweighed the rights of much smaller groups of lakeside interests to use the water for recreation or industry. A newspaper reporter who covered the dismantling of Smith's Mills captured this attitude in 1923: "Smith's Mills has to go not because of any fiendish desire on the part of man to wreck something that has proven a blessing to hundreds seeking to obtain their bread and butter and lay by a bit of money for a rainy day," wrote the reporter, "but because its elimination is going to prove a blessing to more than a hundred thousand people."⁶⁰

The Water District's political success in preserving the Lower Bay may also have been buttressed by a conservation ethic that had long been espoused by the people of New England, providing yet another (albeit less obvious) explanation for the Portland Water District's achievements. Historian Richard Judd argues that in the 1800s, when the ability of New England communities to manage their natural resources started to collapse amidst increased commercialization and mobility, concerned residents increasingly petitioned the state to implement regulations to protect natural resources. Many people in nineteenth century New England had fought for forest protection, restrictions on and restocking of fisheries, and closed hunting seasons to maintain game populations.⁶¹ Similarly, historian John Cumbler resurrects a strong current of conservationism in 1800s New England, from ordinary citizens who "did not retreat or long to retreat into the wilderness but lived in cities and towns," and who "struggled to make the environment of the most settled parts of the nation more amenable to human habitation."⁶² These patterns observed by Judd and Cumbler help to explain efforts to preserve water quality at Sebago. Proponents of the Water District's program sought not to create an anti-modern wilderness around the Lower Bay, but rather to build a modern and efficient water works that would serve the needs and health of the citizens of greater Portland. Land conservation was a means to meet that end.

By 1930, the Portland Water District could claim victory in implementing an ambitious program of land and resource conservation for Sebago Lake. Just two decades after its inception, the District had finally secured the Lower Bay, protecting the purity of its water supply for the future. This achievement should not be seen as inevitable, but rather was deeply rooted in its historical moment. In the late 1800s and early 1900s, a wave of critical breakthroughs in bacteriology that promised to finally erase the scourge of infectious disease caused American institutions to increasingly place the administration of municipal water supplies in the hands of qualified experts. The trustees and leadership of the Portland Water District faithfully adhered to this doctrine, following the advice of a cadre of scientists from across the Northeast who consistently articulated a fundamental vision: protecting the health and safety of the region's water takers by removing sources of pollution around the water intake. This vision became reality not just because the public trusted the advice of expert sanitary engineers, but also because the District possessed sweeping new powers under public ownership legal procedures, because conservation measures could be implemented gradually and af-

fordably, and because residents of greater Portland viewed the conservation of natural resources as a critical public good.

Nonetheless, the actions of the Portland Water District were never unanimously supported despite a broad consensus for conservation. Indeed, they provoked considerable hostility in Standish, where local interests opposed regulating water use at Sebago Lake. These tensions are reflective of larger narratives of the Progressive Era, including the authority of health officials to regulate collective space, the increased role of scientific authority in political rhetoric, evolving understandings of conservationism, and the growing influence of urban interests in rural life. The debates between the District and its critics also reflect a number of key questions that continue to fuel environmental disputes in the twenty-first century. Specifically, who should control the fate of common resources? How can public uses of these resources be reconciled with the private rights of individuals? And who should bear the costs and reap the benefits of environmental protection? These are discussions which continue to this day.

NOTES

1. "Whole Town to Go Under Hammer of Auctioneer," *Boston Post*, January 8, 1923.
2. Portland Water District 1924 annual report, as transcribed in "The History of the Protection of Sebago Lake, 1908 – 1925," Portland Water District, accessed September 10, 2010, http://www.pwd.org/environment/sebago/Sebago_Lake_History.php.
3. 1922 annual report, in "History of the Protection of Sebago Lake."
4. Progressive Era health officials were termed "managers of collective space" by Michel Foucault, exerting authority over, amongst other things, "the question of water" in the name of "social hygiene." See Michel Foucault, *Power/Knowledge: Selected Interviews and Other Writings, 1972-1977*, ed. Colin Gordon (New York: Pantheon Books, 1980), 150-151.
5. *Abstracts relating to the Portland Water Company, taken from the files of the Daily Eastern Argus from 1865-1907*. Ca. 1930. [on file at Maine Historical Society's Brown Library, Portland, Maine].
6. "Why is Sebago Lake So Deep?" Maine Geological Survey, accessed November 27, 2010, <http://www.maine.gov/doc/nrimc/mgs/explore/lakes/sites/feb99.htm>.
7. "Special Committee Would Organize Water District," *Portland Daily Advertiser*, May 7, 1907. For the specific court case, see *Kennebec Water District v. City*

of *Waterville et al.*, Supreme Judicial Court of Maine, Kennebec 96 ME. 234 (1902)

8. As part of the transaction, the public assumed all assets and operations of the Portland Water Company as well as the sister Standish Water & Construction Company, which had been established some years before to provide water to other communities in Cumberland County outside of Portland. See "Portland Water District Celebrates a Century of Experience," Special advertising section, *Portland Press Herald*, March 28, 2008.

9. Martin Melosi, *The Sanitary City: Urban Infrastructure in America from Colonial Times to the Present* (Baltimore, MD: Johns Hopkins University Press, 2000), 120.

10. "Special Committee Would Organize Water District," *Portland Daily Advertiser*, May 7, 1907.

11. "Hearing on Water," *Portland Daily Press*, February 20, 1907.

12. Portland Water District, *Annual Report for the Year Ending Dec. 31, 1908* (Portland, ME: Marks Printing House, 1909), 1.

13. Richard N.L. Andrews, *Managing the Environment, Managing Ourselves: A History of American Environmental Policy* (New Haven, CT: Yale University Press, 2006), 112-117.

14. Nancy Tomes, *The Gospel of Germs: Men, Women, and the Microbe in American Life* (Cambridge, MA: Harvard University Press, 1998), 6.

15. John T. Cumbler, *Reasonable Use: the People, the Environment, and the State, New England 1790-1930* (New York: Oxford University Press, 2001), 140.

16. C.R. Darnell, "The Purification of Water by Anhydrous Chlorine," *Journal of the American Public Health Assn*, 1, no. 11 (Nov. 1911), 783-797; Fern L. Nesson, *Great Waters: A History of Boston's Water Supply* (Hanover, NH: University Press of New England, 1983), 52-53.

17. Barbara Gutmann Rozenkrantz, *Public Health and the State: Changing Views in Massachusetts, 1842-1936* (Cambridge, MA: Harvard University Press, 1972), 75.

18. George Chandler Whipple, *State Sanitation: A Review of the Work of the Massachusetts State Board of Health*, Vol. I [Reprint Edition] (New York: Arno Press, 1977), 234-235.

19. Andrews, *Managing the Environment, Managing Ourselves*, 116

20. Melosi, *The Sanitary City*, 141.

21. 1925 annual report, as transcribed in "History of the Protection of Sebago Lake"

22. "Every Precaution for Water Purity," *Portland Evening Express and Daily Advertiser*, May 15, 1913.

23. 1925 annual report, as transcribed in "History of the Protection of Sebago Lake."
24. 1925 annual report, as transcribed in "History of the Protection of Sebago Lake."
25. "Watershed Protection," Portland Water District, accessed April 16, 2014, <http://www.pwd.org/environment/tapwater/watershed.php>.
26. 1908 annual report, as transcribed in "History of the Protection of Sebago Lake."
27. 1909 and 1913 annual reports, as transcribed in "History of the Protection of Sebago Lake"; "Water Supply for Portland Is Purest Science Can Possibly Make," *Portland Evening Express and Daily Advertiser*, May 17, 1916; "Every Precaution for Water Purity."
28. Robert McCullough, *The Landscape of Community: A History of Communal Forests in New England*, (Hanover, N.H.: University Press of New England, 1995), 211-226.
29. 1911 annual report, as transcribed in "History of the Protection of Sebago Lake."
30. "Malcolm Williams, Florence Reed and Other Thespians to Lose Their Eden if the Water District Trustees Go Through with Plan to Take Indian Island at Sebago Lake from Them," *Portland Sunday Telegram*, September 10, 1922. 5B.
31. "Actor pays fine for lake bathing," *Portland Press Herald*, September 19, 1922.
32. "Malcolm Williams, Florence Reed and Other Thespians to Lose Their Eden."
33. 1922 annual report, as transcribed in "History of the Protection of Sebago Lake."
34. "Water District Leases Picnic Grounds at Sebago Lake and Closes Them to Use," *Portland Press Herald*, August 25, 1925.
35. "Portland Water District Buys Property in Town of Standish," *Portland Press Herald*, May 31, 1922.
36. McCullough, *Landscape of Community*, 212-213.
37. 1913 annual report, as transcribed in "History of the Protection of Sebago Lake."
38. "Precautionary Measures Are Recommended," *Portland Evening Express and Daily Advertiser*, November 12, 1912.
39. "Every Precaution for Water Quality," *Portland Evening Express and Daily Advertiser*, May 15, 1913; 1913 annual report, as transcribed in "History of the Protection of Sebago Lake."
40. "A Further Cut in Water Rates in City Will Be Made Jan. 1," *Portland Daily Press*, September 15, 1913.

41. "Water Supply for Portland Is Purest Science Can Possibly Make," *Portland Evening Express and Daily Advertiser*, May 17, 1916.
42. "Experts Advise Against Filter Plant at Sebago, Says Moulton," *Portland Evening Express and Daily Advertiser*, May 13, 1926.
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45. James Perrigo, letter to the editor, *Portland Press Herald*, August 8, 1926.
46. James Perrigo, letter to the editor, *Portland Press Herald*, September 1, 1925.
47. Philip Webb Davis, letter to the editor, *Portland Press Herald*, August 22, 1925.
48. "Maine Census Data," University of Maine Library, accessed November 22, 2010, <http://www.library.umaine.edu/census/townsearch.asp>.
49. 1925 annual report, as transcribed in "History of the Protection of Sebago Lake."
50. "Vote for William L. Blake," advertisement in *Portland Press Herald*, May 24, 1926.
51. Portland Water District. *Annual Report for the Year Ending Dec. 31, 1924*. Portland, Maine: Marks Printing House, 1925; 1925 annual report, as transcribed in "History of the Protection of Sebago Lake."
52. For an extended discussion of where to situate Boston's new water supply, see Nesson, *Great Waters*, 22-35.
53. Nesson, *Great Waters*, 52-53.
54. Whipple, *State Sanitation*, vol. 2, 267.
55. Nesson, *Great Waters*, 43.
56. Nesson, *Great Waters*, 42.
57. Nesson, *Great Waters*, 79.
58. Nesson, *Great Waters*, 39.
59. "Portland Water District Filtration Plant Bill is Opposed," *Portland Evening News*, February 22, 1929, p. 2.
60. "To Wipe Out Thriving Maine Village to Safeguard Health of Over Hundred Thousand Water Users," *Portland Evening Express and Daily Advertiser*, June 12, 1922.
61. Richard Judd, *Common Lands, Common People: The Origins of Conservation in Northern New England*, (Cambridge, M: Harvard University Press, 1997).
62. Cumbler, *Reasonable Use*, 1.