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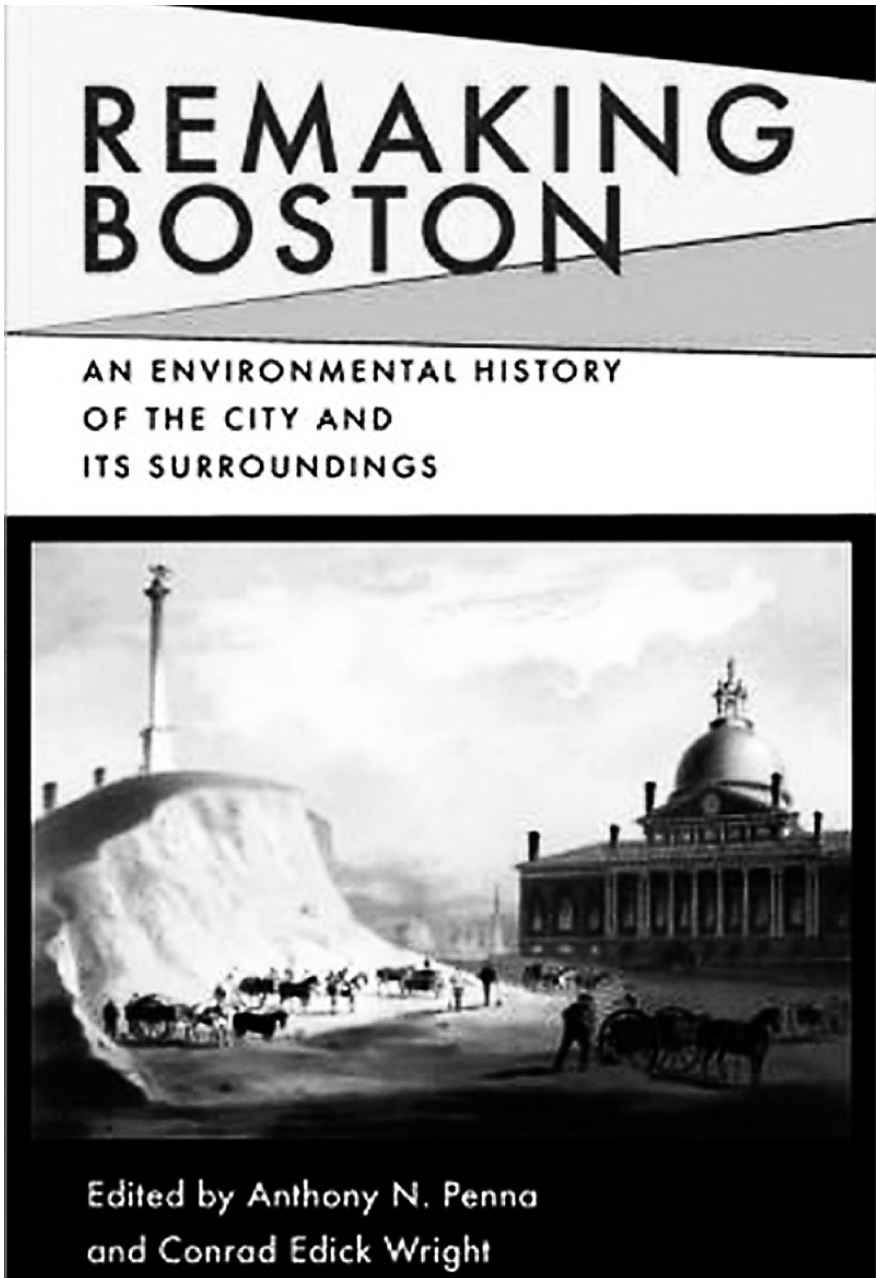
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**EDITOR'S CHOICE**

## Remaking Boston: Remaking Massachusetts

ANTHONY N. PENNA AND CONRAD EDICK WRIGHT



**Editor's Introduction:** *Our Editor's Choice book selection for this issue is Remaking Boston: An Environmental History of the City and its Surroundings, edited by Anthony N. Penna and Conrad Edick Wright and published by the University of Pittsburgh Press (2009). As one reviewer commented, "If you want to find a single volume containing the widest-ranging and most thought-provoking environmental history of Boston and its surrounding communities, then this is the book you should choose." The publisher's description is worth quoting in full:*

Since its settlement in 1630, Boston, its harbor, and outlying regions have witnessed a monumental transformation at the hands of humans and by nature. *Remaking Boston* chronicles many of the events that altered the physical landscape of Boston, while also offering multidisciplinary perspectives on

the environmental history of one of America's oldest and largest metropolitan areas. Situated on an isthmus, and blessed with a natural deep water harbor and ocean access, Boston became an important early trade hub with Europe and the world. As its population and economy grew, developers extended the city's shoreline into the surrounding tidal mudflats to create more useable land. . . Profiling this ever-changing environment, the contributors tackle a variety of topics, including: the glacial formation of the region; physical characteristics and composition of the land and harbor; dredging, sea walling, flattening, and landfill operations in the reshaping of the Shawmut Peninsula; population movements between the city and suburbs and their environmental implications; preservation and reclamation of the Charles River; suburban deforestation and later reforestation; the planned outlay of parks and parkways; and historic climate changes and the human and biological adaptations to them.

*HJM editors selected one of the many excellent chapters to excerpt and reprint here in full. In "Remaking Boston, Remaking Massachusetts," historian Brian M. Donahue provides a panoramic overview of the city's relationship to the countryside from the colonial period to the present. He explores the shifting nature of the economic ties that bound and shaped both city and countryside and concludes that "every remaking of Boston has seen a parallel remaking of suburban and rural Massachusetts." Donahue is an Associate Professor of American Environmental Studies at Brandeis University. This chapter was reproduced with the permission of the University of Pittsburgh Press. The book can be ordered from their website at [www.upress.pitt.edu/](http://www.upress.pitt.edu/)*

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Looking out from the State House dome a century ago, Boston landscape architect and conservationist Charles Eliot (1859-97) could have just seen the wooded hills of Weston, perched on the western rim of the rapidly expanding metropolis. Looking back from the top of Doublet Hill today, a resident of Weston can still make out the dome, nestled among the office towers of the modern city. Eliot wanted to protect Doublet Hill as part of a forest reserve for his metropolitan park system, but he did not succeed. Weston acquired the rocky outcrop some eighty years later, and today it maintains a public lookout, but one needs to be either a resident of that affluent suburb

or an unusually persistent visitor to find the trail. Blasted into the shoulder of Doublet Hill is a cavernous underground storage tank that distributes water to downtown Boston. Directly below the outlook lies the Lake District of the Charles River, where a century ago one would have seen thousands of canoes on a fine spring evening. One might see a handful today, wending their way beneath the soaring concrete bridge piers of Route 128 and the Massachusetts Turnpike. The view has changed, but so has the vantage. Every remaking of Boston has seen a parallel remaking of suburban and rural Massachusetts.

“Remaking Boston” seems an apt title for an environmental history of that old American city. It is not what one would choose for an environmental history of Chicago, by contrast—a new city rising from the mud on the edge of the prairie, “Nature’s Metropolis.” True, part of the Chicago story is a famous rebuilding, in steel. But that seems like part of a single making—the city destroyed by the Great Fire had barely been standing long enough to dry out sufficiently to burn. Or Pittsburgh: “Devastation and Renewal.” That does not sound like Boston, although the city has certainly had its ups and downs, and share of industrial blight. Or Los Angeles: “Land of Sunshine.” That story has been one big illusion from the start.<sup>1</sup>

Boston had something to be remade—a distinctive colonial city that was transformed, but whose remains can still be located and whose legacy is still cherished. The city on a hill is old enough to have been remade several times, in fact. In the first remaking, the hill beneath the Puritan city was pulled down and smoothed out to fill the nearest coves of the harbor. In the next remaking, the fill came in from Needham by rail. In the most recent remaking, the buildings rose higher than the hill had ever been. Meanwhile, the Massachusetts countryside was being dramatically remade in much the same way: the forest was pulled down to make farmland, the forest grew back, and now the automotive suburbs advance to take the forest down again. These tales of city and countryside must be connected.

But how? The growth of Boston certainly made and remade Massachusetts, but this city was never really shaped in turn by its hinterland—at least, not in any obvious way. Not like Chicago, whose growth was clearly tied to processing and shipping the bonanza of natural resources being extracted from the middle of the continent in the nineteenth century: wheat and corn, pork and beef, pine lumber. That was a symmetrical, symbiotic relationship between city and countryside. The growth of New York City was also driven by its connection to that same vast American interior. The relationship between Boston and its hinterland is more complicated and obscure. Certainly, Boston is profoundly of New England, and until the twentieth century the New England countryside did provision the city as it grew. But

there was never that much stuff coming out of the New England soil to drive Boston's growth—something else was going on. One could make a better case for cod as the vital commodity, and the Grand Banks as Boston's first hinterland, than for anything found on dry land. In the nineteenth century the city's most important hinterland was probably Alabama, a supplier of cotton for New England's mills. The Massachusetts countryside never provided anything crucial to make and remake Boston. This relationship between city and country seems oddly asymmetrical and convoluted, like the twisting roads that led into Boston itself. Let's face it: before the city was remade, it was nearly impossible to even get to Boston from the country.

The multiple remakings of Boston and Massachusetts were marked by the changing energy base of the economy: biological, coal, oil; or the eotechnic, paleotechnic; neotechnic eras, to employ the great Lewis Mumford's classic terms. These eras, have also been called the walking city, the city of streetcar suburbs, and the automobile metropolis. As Sam Bass Warner and other historians have reminded us, running through these revolutions is another, tidal rhythm: the always unequal contest between the push of private economic growth, and the corresponding pull to restrain or guide that growth to serve larger interests, such as public health or the beauty of civic space. The political struggle to harness government to serve these ends has pitted the claim that private economic growth is the primary source of public benefits against the counterclaim that uncontrolled growth can cause public harm, and even undercut the natural and cultural foundations of the economy so severely as to be unsustainable. Who has the power to determine what is in the public interest? These are recurring questions in this story.<sup>2</sup>

## THE MAKING OF BOSTON AND MASSACHUSETTS

The first Boston was the city on the hill—or rather, the small, vigorous seaport on the harbor side of the hill, facing London, connected to the rest of Massachusetts Bay Colony only by a narrow neck and a small fleet of ferries, scows, and sloops. Long before that, of course, the geological marker of Boston was the glacier whose advance had depressed the earth's surface and smeared into place the drumlins that are the hills and the harbor islands, and whose melting away deposited beds of gravel, sand, and clay around those hills—the shifting stuff of the city to come. A few thousand years after the glacier departed, the rising sea level caught up with the rebounding earth and returned to the place where it met three smallish rivers: the Neponset, the Mystic, and the Charles. These rivers fed the great tidal estuary that surrounds the peninsulas that would define the city. For millennia, people



### The Boston Neck

The Boston Neck or Roxbury Neck was an isthmus, a narrow strip of land connecting the then-peninsular city of Boston to the mainland city of Roxbury. The surrounding area was gradually filled in as Boston expanded in population. It was originally about 120 feet wide at normal high tide. The first wave of settlers built a wooden town gate and earthen wall on the neck in about 1631 to prevent attacks from Indians and to keep out unwanted animals and people. The gate was constantly guarded and usually locked during certain times during the evening. There was a wooden gallows just outside the town gate. South Bay was originally known as Gallows Bay.

thrived on the riches of that estuary, until the advent of Europeans with their relentless economic and religious imperatives. The native people were able to hold their own against explorers, fishermen, traders, and raiders for a century or so, until disease all but swept them away about a decade before the Puritans arrived in 1630. The resources of the salt marshes remained important to many of the English farmers and fishermen who settled the Massachusetts coast in the following decades, but they had little to do with the making of Boston.

The harbor did. Boston became the leading port on the east coast of America, a position it held through most of the colonial period. This was not by virtue of having a staple crop to export, which New England lacked. It was by virtue of being the first American port to be established, and of being the closest to London. It was also because Boston merchants were part of a keenly driven culture that was not averse to trade, but that remained wary enough of the riches commerce might bring never to rest easy. Boston was close to the banks, and it made the most of salt cod—and later of whale oil—in establishing its key position in the burgeoning Atlantic economy. But as far as any landward backcountry was concerned, there was not much that Massachusetts could offer—nothing like rice, or tobacco, let alone sugar, the central driver of Atlantic trade. Rum, the leading commodity that Boston produced, was made from material that came all the way from the West Indies.<sup>3</sup>

There were a few useful things growing upcountry. There was plenty of white oak in Massachusetts, which was good for making watertight pipes for Madeira or hogsheads for molasses and rum. Red oak went for sugar casks, so there was plenty of work for coopers supplying the West Indies trade, and for farmers supplying them with oak staves and hickory hoops. White oak was also ideal for building ships—another keystone industry of the colonial era. New England farmers provided the Islands with beef, and a few strings of onions; and they provisioned the ships, along with Boston and other seaport towns. But all this seems a bit cobbled together, and one has the feeling that any old hinterland would have done, no matter how rocky and cold. Whatever they could not procure locally, these enterprising merchants fetched from someplace else. And for all its commercial vigor colonial Boston was a small place; perhaps sixteen thousand people in 1750, only a small percentage of the population of the province. We should not exaggerate Boston's importance to the inland economy of Massachusetts. These were, in many ways, two very different and only slightly overlapping worlds.<sup>4</sup>

Cash crops for Boston or export were a small part of most household economies in Massachusetts towns. Inland farmers did produce something



for market and counted on some imported goods, but few organized their farms and households around maximizing commercial production. But they were not self-sufficient, either. They were deeply embedded in complex local exchange networks with other farmers and craftsmen, and with their neighbors. Marketing surplus produce for cash was a simple extension of production that went mostly to support an increasingly complicated household and artisan economy. By the end of the colonial era, New England towns had formed a dense, successful agrarian society made up of diverse, well-run family farms that were capable of garnering themselves a “comfortable subsistence.” These farms produced the bulk of what they needed, plus enough extra to round out their lives and to support a larger economy. The surplus of each farm was not very large, but there were a lot of them, so in aggregate it was considerable. Thus these towns managed slow, steady economic growth over and above demographic expansion, generation after generation. Given the thin ground on which they were standing, it was the first and possibly the greatest Massachusetts miracle.<sup>5</sup>

This was not false magic that depended on depleting the land, either. Instead, it rested on a remarkably balanced, stable form of mixed husbandry, as far as can be told from a detailed study of one such town, Concord. Resources were drawn from every part of a diverse landscape by careful, deliberate management. Intricately drained systems of low-lying hay meadows were replenished by winter flooding, and the manure that resulted from feeding meadow to cattle was recycled onto cornfields, maintaining their productivity for generations. Woodlands, vital for timber, fuel, fences, and a host of artisan trades, continued to cover 30-40% of the landscape, even as the town grew crowded with farms. This was a system capable of going on at a low, steady level of productivity indefinitely. The classic New England pastoral landscape pattern had been set in place by 1750.<sup>6</sup>

By the end of the colonial era, however, it was a system straining at the seams. Older towns such as Concord had been steadily filling with farms for four or five generations; now they were full. A powerful demographic engine was driving their growth, doubling the population of the province every twenty-five years or so. But Concord’s population only doubled every fifty years, because some of its children were always leaving for the frontier. This pattern of New England town-making was stable at the core—that is, old farms and old towns did not decline, but held firm—while deliberately expansive at its periphery, steadily spinning off new farms and new towns. With the frontier free from Indian warfare, what happened in the decades surrounding the Revolution was in a way just another doubling: from half of New England, to all of New England. In the next generation these

Yankees would sweep across New York and beyond, as well as into the cities and mill towns of the new century. But that surge would take place in a rapidly transforming economic and cultural climate, with the first stages of industrialization and the market revolution.<sup>7</sup> The new generations would treat the land differently and remake the countryside.

### **THE EOTECHNIC REMAKING OF BOSTON AND MASSACHUSETTS, 1790–1850**

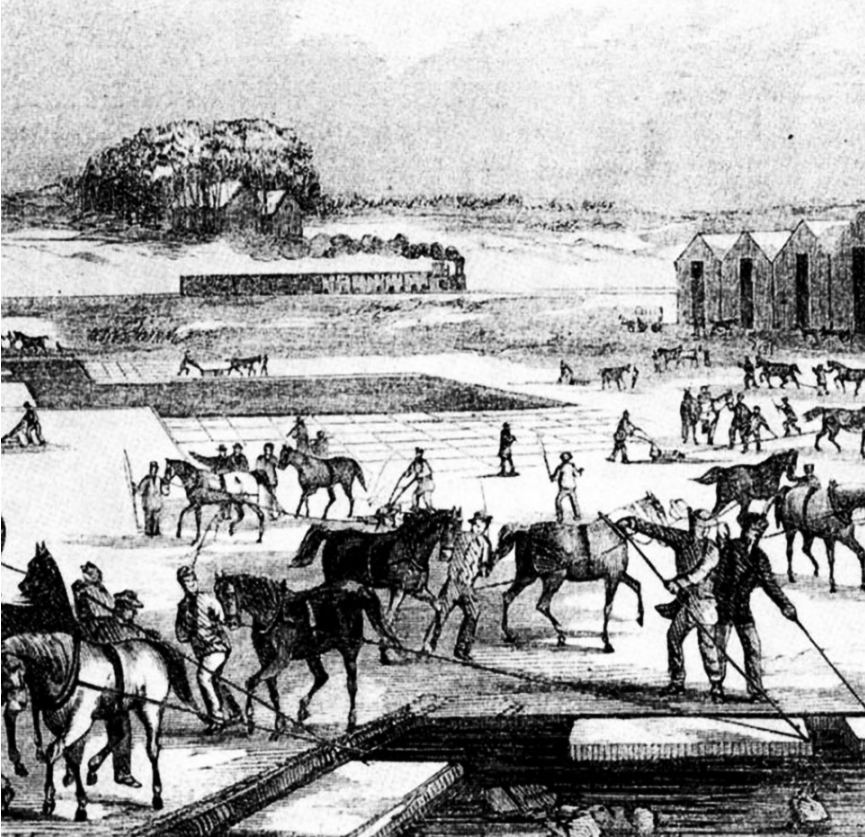
The first remaking of the Massachusetts economy and environment took place largely before the age of steam. It was driven by water and wind, and by the muscles of horses, oxen, and people. This was “America’s Wooden Age”—wood remained the primary construction material, and timber framing imposed a limit on the size of buildings. This remaking was brought about partly by new technologies (that still relied on old power sources), but above all by new ways people went about engaging with the expanding cash economy.<sup>8</sup> Boston grew remarkably during this period, from something less than twenty thousand to well over a hundred thousand people. In 1822, through legal incorporation, the old seaport town became a city. This growth took place even though Boston had lost its leading place in Atlantic commerce to other eastern seaports, first to Philadelphia and then hands down to New York. Those cities had larger, more productive hinterlands to draw on, but completion of the Erie Canal in 1825 really clinched it for New York, opening up the Ohio country and beyond. In essence, the supremacy that Boston had once enjoyed by having the best connection to London passed to New York, which made the first, best connection to the American heartland.

Again, Boston just could not find much to export from its own backyard. Boston merchants built the Middlesex Canal to connect with the Merrimack River in 1803, the first extended canal in the nation—but what, really, can you get out of New Hampshire? Some pine, yes, and naturally some granite. Not quite the stuff of empire. So how did Boston prosper in the new republic? First by the China trade, and then, quintessentially, by reinvesting risky trade profits in manufacturing, particularly of textiles. That, at least for the larger investors who could ride out occasional economic downturns, proved to be stable and profitable.<sup>9</sup> Now what flowed into Boston to be made into finished goods was raw material from a global hinterland that dwarfed New England: hides from Massachusetts but also from Argentina; wool from Vermont but also from Ohio, and then Australia; and above all, cotton from Mobile and New Orleans. The manufacturing was not done in Boston itself, but out in the mill towns that sprang up across the New England countryside. There

was no decent water power in Boston, despite a wretched tidal experiment in the Back Bay that mainly served to trap offal and sewage. The power was all upcountry, in Waltham (a little), and Lowell (a lot), and along every New England river and brook. Boston supplied the capital and the management, sent the raw materials out to the mill sites, and exported the finished goods.

Since Boston merchants did not have anything to export in the way of bulk commodities to balance the lighter merchandise, they had a problem. Ships that had to sail in ballast often stopped at the harbor islands to pick up rocks, because drumlins generate a crop of cobbles and boulders at the waterline. With the rocks removed, the exposed sand and gravel began to wash away at a growing rate, clogging the channel that led to the inner harbor. Now that was a trade imbalance with real consequences: because there were no bulk goods to ship, Boston took to dismantling the very islands that guarded its precious harbor! By the middle of the century the islands were being protected.<sup>10</sup> A better choice for ballast was water itself. Of course, in those days it had to be frozen first, but cold was a staple Boston's hinterland did not lack. Seeing an opportunity, Frederick Tudor began shipping ice to the Caribbean—and then increasingly, as the cotton trade boomed in the 1820s and 1830s, to New Orleans and other southern ports so they could make mint juleps. The keys to the growth of the ice trade were first of all dropping the price of production through better harvesting tools, which was accomplished at Fresh Pond in Cambridge by an inventive Yankee mechanic named Nathaniel Wyeth. Second, many ships were going from Boston back to the Gulf of Mexico (or to Calcutta, or wherever) in ballast. Blocks of ice provided a substitute that was at least worth something, so Tudor got a cheap ride. All these Yankees could dig up to ship in bulk were rocks and frozen water. Perhaps it is no surprise that after a few years Wyeth tired of ice and headed for the Oregon territory in search of fur.<sup>11</sup>

Boston grew physically by taking down Fort Hill, Beacon Hill, and Mount Whoredom (renamed Mount Vernon by its developers) to heights that were more negotiable, and filling in coves all around the peninsula. Government helped to facilitate the expansion of infrastructure that enabled economic growth by chartering bridges, turnpikes, the canal, and (towards the end of the period) railroads on agreeable terms.<sup>12</sup> For the most part, government simply allowed private development to go forward. Boston at the end of this period was still a “walking city” of one or two miles, but not the most attractive place. It was densely packed with houses, businesses, and shops all jumbled together, with a great deal of poverty and filth and a contaminated water supply. The first era of urban transformation and growth was reaching its environmental limits. This gave rise to two kinds



### **Ice Harvesting in Arlington, Massachusetts, early 1850s**

The ice trade was a 19th-century industry involved in the large-scale harvesting, transport, and sale of ice for both domestic and foreign consumption and commercial purposes. Ice was cut from the surface of ponds and streams, then stored in ice houses before being sent on by ship, barge, or railroad to its final destination around the world. Networks of ice wagons were typically used to distribute the product to the final customers. The ice trade revolutionized the U.S. meat, vegetable, and fruit industries, enabled significant growth in the fishing industry, and encouraged the introduction of a range of new drinks and foods.



### Slaves Unloading Ice in Cuba

The ice trade was started by New England businessman Frederic Tudor in 1806. Tudor shipped ice to the Caribbean island of Martinique, hoping to sell it to wealthy members of the European elite there. Over the ensuing years, the trade widened to Cuba and the southern United States, with other merchants joining Tudor in harvesting and shipping ice from New England. During the 1830s and 1840s, the ice trade expanded further, with shipments reaching England, India, South America, China, and Australia.

of responses: first, attempts to reassert the public good, and second, new technologies and energy sources that would allow renewed growth on a brand-new scale.

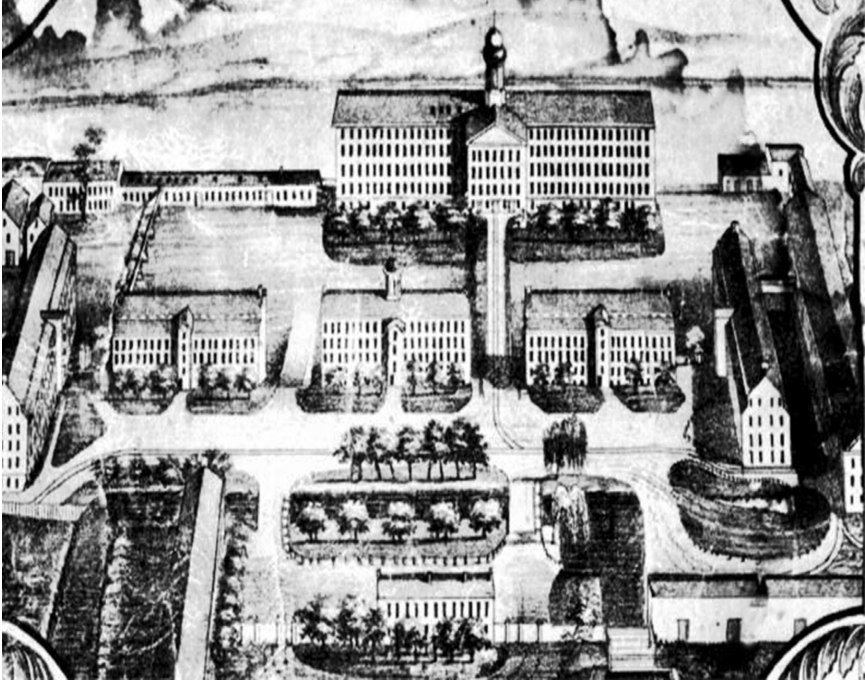
Largely unregulated private growth did meet with a few encouraging efforts to protect public welfare. One was the vote of citizens and the City Council in the 1820s and 1830s to keep Boston Common free of buildings, and to acquire the ropewalks that lay on the flats just beyond the Common to keep the city open to the salubrious bay breezes—land that eventually became the Public Garden.<sup>13</sup> The other was securing a good public water supply, which was accomplished by an effective coalition of working-class demands for a common resource and upper-class desires to combat filth. Water was removed from the pure market economy and made widely available by a municipal authority for all, not just those with access to a private source. The eruption in 1848 of the fountain on the Common thus brought the eotechnic era of urban growth to a close on a high moral note. Reformers saw the fountain as a way for city dwellers to make Romantic contact with nature, through pure water from the countryside, under gravitational pressure. The source of this water was “Long Pond” in Natick, but to give it the sparkle of Native purity, it was rechristened “Lake Cochituate,” a completely spurious Indian name.<sup>14</sup>

Oddly enough, this singular victory for the public access to water took place at the same moment that the Boston Associates were asserting control over the flow of water throughout the Merrimack River basin to power their mills.<sup>15</sup> Long Pond fed the Sudbury River, and its impoundment to provide water for Boston was thus a factor in a second, rural conflict between private and public interest in water, which had an entirely different outcome. The Sudbury flows north to the Concord, which provided an important part of the water power for the Boston Associates’ mills in Lowell, where it plunges into the Merrimack. Along the way the Concord also supplied water to the Middlesex Canal, which had its summit at the Billerica mill pond above Lowell. When the Boston & Lowell Railroad put the Canal out of business in 1851, a textile manufacturer named Talbot acquired the Billerica milldam and its water privilege. This immediately brought him into conflict with hundreds of long-suffering farmers. For half a century farmers upstream on the Concord and the Sudbury had been complaining about increased flooding of their valuable hay meadows along the river, but they had failed in every attempt to dislodge the Billerica dam because of “instrumental” legal protections afforded it by the Canal charter. Although the Canal was dead, the courts ruled that its protection from lawsuits had miraculously survived and passed to Talbot.

Boston's acquisition of Lake Cochituate, which had provided as much as one-third of the summer flow of the Sudbury, added an interesting new dimension to this ancient struggle. Now the mill owners in Billerica and Lowell became alarmed about the loss of critical summer water-power from the river and sued the Boston Water Board. In response, in 1851 the city built compensating reservoirs at the headwaters of the Sudbury and Assabet rivers to replace the lost flow—and then conveyed those reservoirs to the mill owners. Every summer, when the flow of the river dropped, affording the farmers a chance to cut and cart their hay, the manufacturers would fill the river back up and flood the meadows. The river was “dammed at both ends, and cursed in the middle.” This time the outraged farmers took their case to the state legislature, where again, despite an initially sympathetic hearing, they inevitably lost.<sup>16</sup>

This story illustrates powerful new connections between the development of the city and the development of the countryside, and makes it clear that private interests were still firmly in command. The first remaking of Boston was accompanied by a parallel remaking of rural New England. Industrial development in the second quarter of the century dispersed rapidly across the countryside, taking advantage of every available source of water power. Besides the large mills of the Boston Associates, an astonishing proliferation of smaller enterprises began manufacturing just about everything imaginable—some of it made from imported raw materials, but much of it from every local resource that could be found, particularly wood. Out in little Petersham, Massachusetts, miles away from any railroad, an entrepreneur began making ladders, taking advantage of the light, stiff wood of the small spruce trees that grew around local bogs. In Bennington, Vermont, enterprising men hauled cotton from the Hudson over the Taconics in wagons to take advantage of their small but energetic mountain streams. In tiny New Hampton, New Hampshire (which the railroad would never reach), a water-powered mill began turning out boots for markets in Boston and beyond. Everywhere, the old artisanal economy was vigorously expanded to reach regional markets, making use of anything and everything.<sup>17</sup>

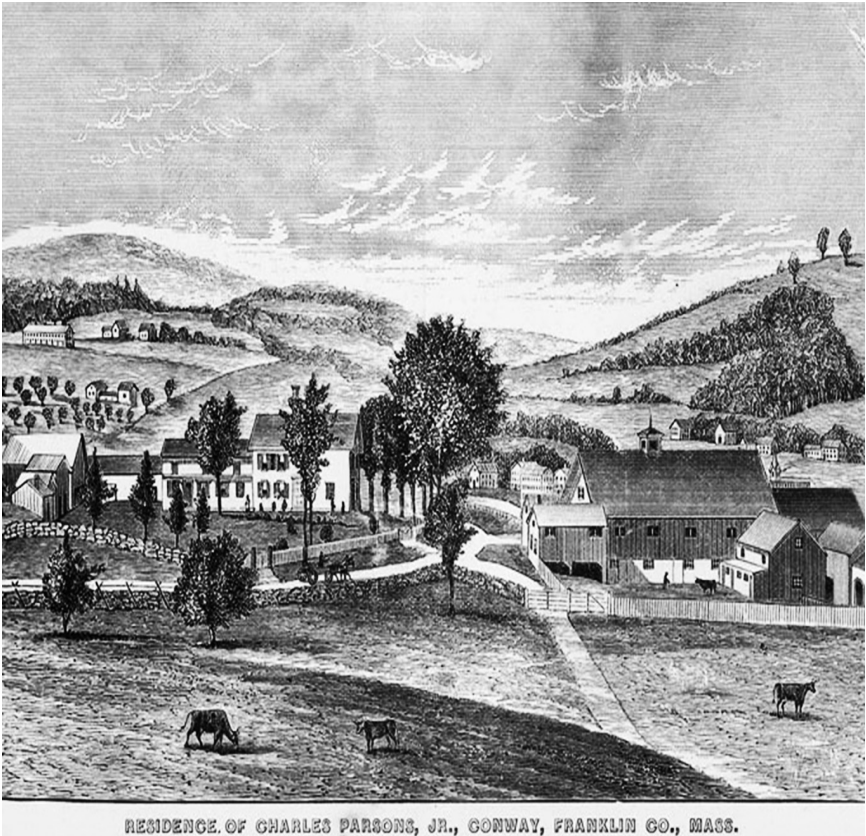
Farmers also took part in this transformed economy, and in the process they remade the countryside. Farm families turned themselves into middle-class consumers and entrepreneurs. Many of the basic goods they had formerly procured for themselves or through neighborly exchange, they now began to purchase on the market: they adopted wheat flour in place of cornmeal, factory cloth for homespun, whale oil for tallow candles, coal stoves for fireplaces, coffee and tea for cider and rum. To pay to play in this consumer economy, farmers refocused their agricultural enterprises on



### **Textile Mill Owned by the Boston Manufacturing Company**

The Boston Manufacturing Company was organized in 1813 by Francis Cabot Lowell, a wealthy Boston merchant, in partnership with a group of investors known as The Boston Associates, for the manufacture of cotton textiles. This soon changed the face of New England and its economy from one based largely on agriculture to one dominated by industry. By 1845, they owned 31 textile companies—located in Massachusetts, New Hampshire, and southern Maine—that produced one-fifth of all textiles in the United States.





RESIDENCE OF CHARLES PARSONS, JR., CONWAY, FRANKLIN CO., MASS.

### **Residence of Charles Parsons, Jr., Conway, Franklin County, Mass.**

This farm in Western Massachusetts reflects a typical Massachusetts pastoral landscape. By the late 1800s, Massachusetts had reached its most deforested point, declining from 75% to 25% forest cover.

specialized production for market. Merino sheep swept the forest from the hills of western Massachusetts, while many other upland farmers took part in the stall-fed beef trade, selling a few head every year to the Boston drovers. Others began growing broom corn on their best land, cutting broom handles in their woodlots, and making brooms. Long-settled towns such as Concord expanded their upland hayfields and pastures to market beef, butter and cheese, oats and hay, and firewood to the city. In neighboring mill towns, there were many more mouths of men, cows, and horses to be fed, but across New England there were also many more farmers vying to feed them. A few did well, not a few went bankrupt, and most struggled to get by, becoming Henry Thoreau's men of quiet desperation, speculating in herds of cattle to buy their shoelaces.<sup>18</sup>

As a result of this vigorous expansion of commercial agriculture, Massachusetts reached its most deforested point, plunging from perhaps 75% or more forest cover at the beginning of the century to approximately 25% by the third quarter of the century. The western part of the state saw a great surge in both farms and farmland, but even an old town such as Concord, well into its seventh or eighth generation of settlement, slashed its woodland from 30% to 10% by 1850—without any increase at all in the number of farms. The same thing was going on all across New England: the new, commercial form of agriculture was in many ways more extensive, and more exhaustive, than the colonial model. As Henry David Thoreau in Concord and George Perkins Marsh in Vermont both noted, the farm boom put tremendous pressure on the environment, causing not only loss of trees and wildlife but increased erosion and flooding. Continuous mowing and grazing quickly drained the limited native fertility from upland hay fields and pastures, which began to be taken over by brush: the land was being actively unimproved.

Most of the era's agricultural reformers viewed such "skinning the land" as a holdover from the colonial days of crude subsistence farming, rather than seeing it for what it was: the full release of the market's power to turn nature into commodities. A few voices, such as Marsh and Thoreau, protested this wholesale degradation of the land by the combined impact of many private farmers, and spoke in defense of the broader public benefit of land stewardship. No one was yet calling for government action to protect the environment, but some were at least recognizing its value. In the colonial era the land had been husbanded by locally based agrarian economies much more effectively than has been recognized. That sense of the duty of stewardship may not have entirely disappeared from agrarian culture in the nineteenth century, but

it certainly was submerged by much more powerful commercial desires and demands.<sup>19</sup>

Perhaps the most important commodity that Boston's hinterland provided for this first remaking of both city and countryside was Yankees—lots of Yankees. A dense rural population provided the avid consumers, the provisions, the millworkers, the mechanical know-how, and the innovative drive to transform New England, even before there were railroads and steam to work with. One has to stand amazed at what they accomplished. But in the process of transforming it, they had pushed their natural infrastructure to the brink.

### **THE PALEOTECHNIC REMAKING OF BOSTON AND MASSACHUSETTS, 1850-1920**

The paleotechnic era was heralded by the appearance of railroads in the 1830s, and fully arrived with the linking of New England to the national rail network by the bridge at Albany in 1866. Its greatest expression was reached between 1890 and 1920, but it lingered through the Great Depression and World War II. Powerful new forces broke through the old environmental limits to growth in city and countryside, driving a sweeping remaking of both. With this transformation came a host of new social and environmental challenges, followed again by innovative responses to protect the public interest. The paleotechnic was the era of coal, steam, steel, railroads, and, in the later part of the period, of electricity. Boston grew explosively, by another order of magnitude—from just more than a hundred thousand to well over a million inside its metropolitan ring by the turn of the century. The Back Bay, the South Bay, the South Boston Flats, the Charlestown and East Cambridge flats, and the Cambridge Marshes were all filled in. Beyond the small elite downtown neighborhoods and the crowded working-class tenements and factories grew the larger segregated metropolis, with its spreading rings of streetcar suburbs for the middle class, out to about ten miles.

Across the country growth of such urban behemoths was driven by the railroad, with its year-round, all-weather ability to integrate a national economy and to concentrate resources, especially coal, in the cities. Feeding on that steady diet of coal, steam power allowed industries to cluster near one another as well, rather than needing to be dispersed throughout the countryside near waterpower. The rise of the great industrial cities intersected with the incoming tide of immigrant labor, which could be fed and housed in dense urban quarters, thanks to the influx of food, lumber, and other resources being extracted on an unprecedented scale throughout the nation.

The leading industries in Boston remained textiles and shoes, joined by ready-made clothing, machinery, and metalworking—and in the early twentieth century, by the rise of electrical goods as well.

Even as Boston reached metropolitan size, smaller mill towns and cities across New England added steam to their old water power base and still flourished. The transformations of the era are nicely illustrated by the little city of Waltham, which continued to grow in its own right even as it began to take on new metropolitan roles. The Boston Manufacturing Company's celebrated 1813 textile mill kept operating, but now a steam engine powered the spindles and looms, and the workforce was made up almost entirely of Irish immigrants. These had become low-wage, dead-end jobs. Upwardly mobile Yankees found work at a newer enterprise across the river, above the old mill dam. The Waltham Watch company was among the progeny of the Springfield Armory, whose expertise in cutting precise metal parts spawned many new industries. The company made its fortune during the Civil War supplying cheap, reliable pocket watches to Union soldiers, and it ended its operations making bomb timers during World War II. Those two wars defined the arc of its existence and of the paleotechnic era. In its heyday Watch City was home to several watch and clock factories and to many ancillary precision machine shops, which spun off still more enterprises, such as the Metz Company, a pioneer manufacturer of safety bicycles, motorcycles, and automobiles. A retail center developed along Moody Street, serving a dozen surrounding towns. It was anchored by a new department store, Grover Cronin's. Yet most of this commercial and residential development was concentrated in a small area by the river and the railroad. Until the 1950s and the coming of the highways, market gardens and dairy farms still covered most of Waltham north of the Charles.<sup>20</sup>

Waltham was like many other smaller mill cities across New England, thriving into the twentieth century until its older industries began slowly to decline. But Waltham was also close enough to begin to feel the pull of the metropolis. Eight to ten miles from Boston, Waltham was too long a ride to become a residential streetcar suburb. But it was well within the range of the electric trolley lines for recreational outings. The "Lake District" of the Charles River, winding for several miles above the Boston Associates' Moody Street dam, became a popular weekend destination. Amusement parks and other recreational facilities sprang up at the end of the lines in Waltham and Newton. The river was thronged with boathouses and canoes. Across the river, Weston—which never allowed the trolleys to infiltrate its borders—was transformed into a town of grand country estates, the summer places of Brahmins who spent the winter on Beacon Hill. Beyond the streetcar

suburbs emerged outer rings of market gardens, dairy farms, piggeries, country estates, athletic clubs, and amusement parks.<sup>21</sup>

The bulk of the inner city's residents, of course, endured difficult lives. Historian and philosopher Lewis Mumford (1895–1990) described the paleotechnic era as an “upthrust into barbarism.” Sam Bass Warner and other urban historians confirmed Mumford's assessment forty years ago, and the work of Joel Tarr and environmental historians since then has done little to alter that grim verdict. For that half of the population who were not able to disperse to the suburbs, urban working and living conditions were grimy and dangerous. Boston is the windiest city in the nation, so perhaps



**Lewis Mumford**

the pall of coal smoke was not quite as pervasive as that which hung over other cities of heavy industry (such as Pittsburgh) located in river valleys. But that westerly breeze was not quite as welcome when it blew at low tide over the mudflats that received the city's sewage and the offal of packinghouses. The rivers ran full of dyes and industrial wastes. Air and water pollution, besides making life unpleasant or downright miserable, posed a real threat to public health.<sup>22</sup>

In response came slow and difficult, never adequate, but determined efforts to reassert the public interest in the face of environmental degradation. One was the creation of parkland within and around the city—first with landscape architect Frederick Law Olmsted (1822-1903) and the “Emerald Necklace” and then with the work of Charles Eliot and Samuel Baxter to extend that vision to make the Emerald Metropolis. [Editor's note: The Emerald Necklace consists of a 1,100-acre chain of parks linked by parkways and waterways in Boston and Brookline. From Boston Common to Franklin Park it is approximately seven miles; to this day it is not fully constructed. The name derives from the way the “chain” appears to hang from the “neck” of the Boston peninsula. It is the only remaining, intact linear park designed by Frederick Law Olmsted, often described as the founder of American landscape architecture. For more on the creation of this park system, see the next issue of HJM.] In 1893 the Metropolitan Parks Commission anticipated

half a century of suburban growth when it moved to acquire a ring of hills and beaches at the rim of the Boston basin, along with major parts of the three rivers that ran down from that bedrock periphery. The commission also constructed graceful parkways that helped give shape to ensuing suburban growth, until they were overwhelmed by automobiles at the end of the paleotechnic era. Finally, the wasteland of warehouses and stinking flats around the shores of the Back Bay was transformed by the Charles River dam in 1902, which flooded the estuary. Beautiful esplanades were created along both sides of the river.<sup>23</sup>

The struggle to protect those waterways from industrial and municipal pollution and to secure again a safe and adequate water supply was even more fundamental. By the last decades of the nineteenth century, the sheer scale of Boston's metropolitan growth, along with the multiplication of industrial cities along New England's rivers, once again overwhelmed the water and waste infrastructure of the late eotechnic: too many bodies were serving as both sewers and sources for too many people. Some river water became so foul that even other industries could not use it. A new, regional approach was required—metropolitan water and sewer boards were created alongside the parks commission in the 1890s, and in 1919 all three were combined to form the Metropolitan District Commission. MIT chemist and biologist Ellen Swallow Richards and William Sedgwick's sanitary survey established that water pollution was a public health menace, causing typhoid fever. The regional sewer system was extended to intercept most of the sewers emptying into the rivers around Boston and divert the outflow into the harbor—an enormous improvement for the next half a century, anyways. Finally came the discovery at Lawrence in 1893 of the ability of sand filtration to cleanse drinking water of germs. Many Massachusetts cities constructed filtration plants, greatly reducing typhoid epidemics. This was a public health triumph, although it ironically stalled the momentum that had been building to treat municipal and industrial wastes and actually clean up the rivers themselves, leaving them to grow steadily more polluted through much of the twentieth century.<sup>24</sup>

Once again, Boston looked west for a fresh supply of still more remote, pure water. The Sudbury River (which had been tapped to augment Lake Cochituate) was polluted and inadequate, and Boston wanted to avoid the cost of having to filter the Merrimack. Instead, the city and its suburbs reached deep into the countryside and took the Nashua River above Clinton in 1905, and within a few decades jumped farther west to the Swift and the Ware, on the plateau beyond Worcester. Naturally these reservoirs were christened with Indian names of their own, Wachusett and Quabbin. They

were massive paleotechnic undertakings—each was the largest water supply reservoir in the world at the time of its construction, and each increased the storage capacity of the Boston system four- or fivefold. They demonstrated the unstoppable political clout of the metropolis, which by this time held close to half the state's population. These takings are bitterly remembered in central Massachusetts to this day. Besides flooding several villages for the Quabbin, the Metropolitan District Commission acquired more than fifty thousand acres of surrounding land to be maintained in forest for watershed protection—by far the largest piece of contiguous forestland in the state today and also, interestingly, the most intensively managed.

The Massachusetts countryside was also remade in the paleotechnic era: it was dramatically reforested. Forest cover, which had fallen to a low of about 25 percent of the state between 1850 and 1875, rebounded to about 50 percent by the beginning of the twentieth century. With the rise of the city and the industrial economy, New England farming went downhill—or so it would appear, and so we have often been told. But it would be a mistake to equate this forest recovery with the economic collapse of Massachusetts farming at the hands of cheaper Midwestern production—at least for the period before 1920. Census data tell a different story: between 1880 and 1910 the amount of farmland in Massachusetts was indeed cut in half, but during that same period the value of agricultural production in the state, in constant dollars, doubled. The peak for Massachusetts farming occurred not at the time of the Civil War but of World War I, whether measured in constant dollars or gallons of milk. Plenty of farmland was being abandoned during the paleotechnic era—but not very many farms. Agriculture enjoyed robust growth for half a century after it was supposed to have been mortally wounded, even as the hills were being re-covered by trees.<sup>25</sup>

This anomaly can be explained by one word: railroads. A few farms in remote hill towns surely were given up, but many more across the state were thriving—first and foremost, by reprocessing cheap western feed grain into milk and produce for urban markets. Massachusetts agriculture joined a streamlined national food system supplying a burgeoning regional market with those products that could not easily be shipped halfway across the continent, and taking advantage of those that could. Urban growth and western grain carried New England farming to its peak production. Suburban towns such as Waltham and Weston, Arlington and Concord, filled with flourishing market gardens that grew fruits and vegetables for the city. These farms absorbed immense flows of recycled urban waste such as horse manure and spent brewery malt. Farmers also provided staggering loads of hay for city liverymen and teamsters—often from highly productive hay fields fertilized with

the surplus manure from their dairy herds. As the Boston milk shed expanded across the state, farmers within a wagon ride of a rail depot moved toward year-round stall feeding of their cows to increase the flow of milk. They gave up their pastures, not their farms. The worn-out pastures grew back, famously, to white pine—a more profitable crop, as many farmers foresaw. This was not an economic collapse but an economic calculation, conditioned by ecological reality: it was difficult and expensive to keep pastures productive and free of pines. By the turn of the century the pasture pine was being cut for boxboards, supplying packaging material for much of the commerce of the day.<sup>26</sup>

While resources poured into the region thanks to the headlong exploitation of the continent's richest farmlands, grasslands, and forests, a more attractive balance was restored over the Massachusetts countryside. Forests recovered half of the landscape, and a more intensive, less degrading agriculture held sway over much of the remainder—beholden though it may have been to the plowup of the tallgrass prairie a thousand miles away. But while the Massachusetts forest was increasing in acreage, as quickly as it could grow back, it was still being heavily cut. An observer might have been forgiven for not seeing the forest for the stumps. The boxboard boom in southern New England coincided with the climax of a wave of clear felling across much of the East. Spruce and fir were cut for pulp, hemlock for tanbark, and with the advent of portable logging railroads, the great hardwood forest fell to provide furniture, ties, pit props, and a thousand other industrial and household products.

Forest fires ravaged the denuded granite hills and sand plains from Minnesota to Mississippi to Maine, raising fears of a coming timber famine. New England's great rivers were jammed with logs from the North that would occasionally perform remarkable feats such as carrying away a railroad bridge over the Connecticut on the spring freshet. Calls to curtail flooding and to safeguard the nation's supply of timber and water did stimulate a public response, a vigorous forest conservation movement that ran alongside the urban campaign for parks and safe drinking water. Today the Commonwealth of Massachusetts owns some 500,000 acres of forest, or about a tenth of the state. Most of it was acquired in early decades of the 20th century in response to the excesses of the raw industrial expansion of the paleotechnic era.<sup>27</sup>

## **THE NEOTECHNIC REMAKING OF BOSTON AND MASSACHUSETTS, 1920–?**

The neotechnic era began to emerge with the rise of the automobile in the early twentieth century, but it really took off after World War II. It was, and is,



quintessentially the age of oil, and along with it the automobile, the airplane, chemicals, plastics, the expansion to omnipresence of electricity, modern medicine, and telecommunications. With the recent rise of computers, some say we are now in (or at least on the cusp of) a new “information economy”—but whether the Internet will produce another remaking of the urban and rural landscape, or just more of the same, remains to be seen. A true Mumfordian [or follower of Lewis Mumford] would need to see a new transportation system, new materials, and above all, a new energy base for society. None of that has yet appeared. For now, it seems best to say that we are still in the full flowering of the neotechnic age, and still struggling to enact restraints that are able to protect the public welfare from the mixed blessings brought by our technology, and the economic engine that drives it.

The old industries that had supported the paleotechnic New England economy suffered severe decline in this era, but by the last decades of the twentieth century, metropolitan Boston rebounded as a center of finance, insurance, health, and education. Above all, the region’s economy grew as an innovative “knowledge center” tied to the development first of electronic and then of high-tech computer industries. Downtown Boston grew upward with modernist skyscrapers along the “high spine” from Government Center to Back Bay. The big land-making project of this era was in East Boston—giving us a major airport that lies amazingly close to downtown, another mixed blessing.

The essence of the neotechnic remaking of the city, of course, was a stupendous round of highway construction and suburban sprawl. The idea of building graceful parkways was jettisoned in favor of brutally functional expressways punching into, over, and through the city. Charles Eliot’s belt of parklands around the city had a massive circumferential highway (Route 128) threaded right through it in the early 1950s, and a second ring road (Route 495) followed a few decades later, another fifteen miles out. Virtually all of the privately held land inside the old metropolis that was still open—and there was quite a lot of it, at midcentury—was filled in with residential and commercial development. Towns within the next ring, between Routes 128 and 495, chose to zone themselves into either low-density affluent residential suburbs or higher-density places of office parks, shopping malls, tract housing, and condominiums. That is the shape of the amorphous neotechnopolis we now inhabit, with outcroppings of several earlier urban and suburban strata poking through it here and there.<sup>28</sup>

In the same tidal rhythms that marked earlier remakings of the city, recent decades have seen renewed efforts to place restraints on both private and public growth of the automotive metropolis. From the late 1960s several

major highway proposals have been halted, and a grueling campaign has finally been completed to bury the most egregious one that did get built, the Central Artery, beneath the ground. Persistent attempts have been made to revitalize the inner city's neglected neighborhoods, some more successful than others. Bit by bit, green spaces and walking places have been reclaimed from the highways, and strung along the shores of the harbor and the rivers. Those waters themselves, so central to the beauty of the city but once again overwhelmed by pollution by the middle of the twentieth century, have now been restored to (sometimes) swimmable condition by a massive upgrading of industrial and municipal waste treatment. As for water supply, by the 1970s the metropolis was preparing to reach still farther west beyond Quabbin, to the Connecticut River, to slake its thirst. But this time political resistance was too great for the city to impose its will on the western part of the state, and a successful program of water conservation was implemented instead. Metropolitan water consumption today is only two-thirds of what it was twenty years ago.<sup>29</sup>

The growth of the automotive metropolis continues to affect the countryside, of course. Today the sprawl frontiers stand west of Route 495 in Worcester County, in southeastern Massachusetts between Plymouth and Cape Cod, and in southern New Hampshire. The Cape and the islands are substantially built out. Since midcentury, a wave of residential land-clearing has been spreading across the state in a way reminiscent of the long wave of agricultural land-clearing two centuries earlier—but if that deforestation for farming was soft and reversible, this deforestation for rooftops and pavement could prove hard, and permanent. It poses another enormous challenge for conservation and the reassertion of the public interest in the face of thousands of individually rational private decisions to develop in the easiest way, instead of the best.<sup>30</sup>

The remaking of rural Massachusetts during the neotechnic era has been a two-part affair. The rebound of forest that began in the late nineteenth century has given way to fragmentation and loss in the past few decades. Forest cover reached 75 percent by 1970—an exact inversion of where it stood a century earlier, and a return to where it stood a century before that. Since 1970, though, forest has declined to about 64 percent of the landscape. The past century has seen a severe decline in Massachusetts agriculture. Farmland has been losing ground to the forest on one side and to suburbia on the other. New England farming weathered the paleotechnic opening of the nation's heartland by railroad, but it could not withstand the neotechnic opening of a global market for every crop, made possible by cheap oil, chemical fertilizer, refrigeration, trucks, and airplanes. Real economic



### **Boston's Central Artery, 1964**

After more than eight years of construction, the Central Artery and the Southeast Expressway were joined together on June 25, 1959. Boston's respite from crowded city streets was short-lived, as downtown congestion moved to the new highway.

decline for Massachusetts agriculture set in after 1920: market gardens were undercut by Sun Belt produce, hay markets vanished along with the horse, milk production steadily consolidated into larger herds on cheaper land elsewhere—in Vermont, or Wisconsin. In the suburbs, land worth far more for growing houses than for strawberries and cream steadily succumbed to its highest and best use. As the decades passed and development moved out across the state, the rate of suburbanization finally overtook the rate of reforestation. Once again, the forest is falling.

Even after the forest stopped expanding and began to shrink in acreage, it continued to increase in volume. As the trees have grown larger and more

cut-able, they have been cut less and less. Just as New England agriculture has declined in the face of industrial agriculture, regional forestry has declined in the face of a globalized timber market. The anticipated twentieth century timber famine never arrived. Instead, the demand for forest products has remained soft in comparison to the vast global supply that has come within reach, and there is growing antipathy on the part of many private and public owners in places like Massachusetts to cut. This puts us in the odd position of an affluent suburban society, mighty consumers of lumber and paper, living in the midst of a forest with which we have almost no working relationship. Massachusetts is among the most urbanized states in the country, and simultaneously among the most heavily forested. Yet the state imports something like 98 percent of the forest products it consumes.<sup>31</sup>

Great strides have been made since the 1960s in pushing back against rampant suburban development. Massachusetts wetlands and waterways have been successfully shielded from further degradation by the wetlands protection act and floodplain zoning. Acquisition of conservation land and easements by federal and state agencies, municipalities and nonprofit organizations has gone steadily forward, so that today some 1 million acres, or about 20 percent of Massachusetts is protected land. All this is to the good, and yet it has done little fundamentally to slow the pace of development. In fact, some argue that the combination of ad hoc land protection and large-lot zoning has only pushed suburbanization more rapidly outward. Meanwhile, less and less is produced from Massachusetts farms and forests, year by year. In the neotechnic era the means by which such basic resources as food, lumber, paper and energy are extracted from the environment have been pushed far away, out of sight and often out of mind. Leo Marx once labeled this “sentimental pastoralism.” Some today have called it the “illusion of preservation.”<sup>32</sup>

Lewis Mumford, writing in the 1930s, declared that the neotechnic era he saw unfolding before him was a “cultural pseudomorph.” By that he meant that promising new technologies, which might have led to clean, attractive, and harmonious cities and countryside, were instead being driven by the same old paleotechnic forces of heedless growth. In the real neotechnic we got the “townless highways,” but whatever became of the “highwayless towns,” the garden suburbs that Mumford and others envisioned? One wonders what the next remaking of Boston and of Massachusetts will look like. Will it be just another pseudomorph, where mindless growth drives on in new forms, using new technologies? In part, no doubt. What forces will drive change, and how will the endless tug of war between private enterprise (with its undoubted economic benefits) and the beleaguered public interest play out?<sup>33</sup>

If we follow Mumford's paradigm, it seems clear that the next shape of city and countryside will depend on a shift in energy base. A permanent, substantial increase in the price of oil may bring something different in the way of urban and rural development than the sprawl we have been seeing for the past half-century and more. The change will be especially striking if (as some predict) any substitute for transportation fuel proves substantially more expensive than oil was during its heyday. We may also feel the impact



### **Car-Tropolis**

This photo from the 1950s shows a car passing under the arches of the Central Artery, illustrating its scale and implying a future for the city in which the car shaped the landscape. The Central Artery project of 1991–2007 was designed to relieve highway congestion and reclaim Boston's surface streets from the outsized demands for real estate posed by car-centric infrastructure.



### **Boston after the Big Dig**

With the Central Artery successfully relocated underground, surface streets in Boston look less imposing and open space is a more conspicuous part of the urban fabric. In the background, the Leonard P. Zakim Bunker Hill Bridge, with its ship's-rigging-like cables, recalls Boston's heritage as an important port city.

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of rapid climate change and other unresolved environmental side effects of the fossil fuel era. For example, a rise in temperature of several degrees could make for dramatic changes in the species composition of our forests, while a rise in sea level of several feet would make for arresting changes in the coastline around our city. If such forces dominate our future, one can imagine a remaking of Boston and Massachusetts that would involve renewable sources of energy, more serious reliance on telecommunications in place of (rather than in addition to) frenetic personal travel, a return to

denser development of cities and suburbs, and a complete rethinking of what resources we most value in the countryside, and how we can both utilize and protect them.

Without making rash predictions, we can at least imagine a future of enlarged public interest in both city and countryside that is worthy of the likes of Henry Thoreau, Charles Eliot, and Lewis Mumford. In the city this would mean reclaiming green space, walking space, and living space from the automobile. It would mean reviving and expanding a workable system of public transportation that people will actually use. It would mean daylighting our streams, restoring and expanding our riverbanks, our parks, and a healthy urban forest. It would mean the spread of community gardens, urban farms, green walls and rooftops, and everything else that would make the city the fully livable place it ought to be.

In the suburbs such a remaking would mean open space that is not an exclusive retreat from the city, but easily accessible by bicycle trails and public transportation. Thousands of acres of conservation land and hundreds of miles of walking trails already exist in such towns as Weston, Lincoln, and Concord, but are hardly enjoyed. We can envision thousands more acres of community farms providing organic fruits, flowers, and vegetables. Working models are already thriving and engaging people with the land. Farther out, across rural Massachusetts, encompassing a modest but vigorous working farmscape, we can envision “Wildlands and Woodlands”: one-half of the state in permanently protected forest. Part of this forest—say one-tenth—could be in large wild reserves, the bulk in sustainably managed woodlands. This would give us a robust natural infrastructure providing biodiversity habitat, watershed protection, recreation, renewable wood products, and carbon sequestration. This vision is not antidevelopment—indeed, many rural towns desperately need more people to restore viable communities, and to care for the land. An affordable “smart growth” approach would embed clustered development in a landscape of working farms and forests.<sup>34</sup>

I would not claim that such a green remaking of Boston, its suburbs, and its hinterlands will come easily, even if the era of cheap fossil fuel gives way to something else. But as a citizen, I can work for that future. As a historian, I do believe in a usable past. Just as we cannot divorce the city from the countryside in understanding the history of Boston and Massachusetts, we also need to connect the city and the countryside in the making of a livable commonwealth today.

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