CAMBRIDGE,

MIDDLESEX COUNTY, MASSACHUSETTS.

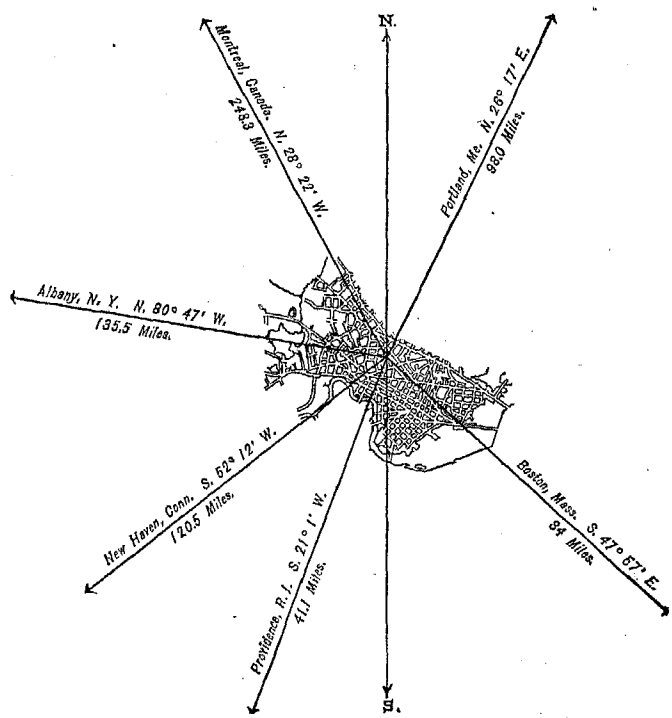
POPULATION

IN THE

AGGREGATE,

1800-1880.

	Inhab.
1790	
1800	2,453
1810	2,323
1820	3,295
1830	6,072
1840	8,409
1850	15,215
1860	26,060
1870	39,634
1880	52,669



POPULATION

BY

SEX, NATIVITY, AND RACE,

AT

CENSUS OF 1880.

Male	25,024
Female	27,645
Native	37,001
Foreign-born	15,668
White	51,151
Colored	*1,518

*Including 12 Chinese, 1 Japanese, and 1 Indian.

Latitude: 42° 23' North; Longitude: 71° 7' (west from Greenwich); **Altitude: 0 to 77 feet.**

FINANCIAL CONDITION:

Total Valuation: $49,235,098; per capita: $935 00. Net Indebtedness: $3,403,723; per capita: $64 62. Tax per $100: $1 70.

HISTORICAL SKETCH.

The first settlement of Cambridge was planted by a section of the Salem Charlestown Company on the upland which rose out of the Charles River marshes between Charlestown and Watertown, under the name of "the new town", changed in time to the proper name "Newe Towne", which served until an important event made it expedient that it be rechristened. The first intention in the planting of Cambridge was the establishment of a fortified place for a seat of government. Accordingly in the spring of 1631 the actual foundation of Cambridge began to be laid. The governor and a few others went forward with the building of their houses, but the former, changing his mind,

concluded to establish himself on the peninsula of Shawmut, across the river basin to the east. So, taking down the frame of his house, he moved it thither. His associates remained, although disappointed and grieved. The distinction of being the seat of government was thus lost.

The settlement was devoid of natural advantages or attractions. It was a broad, irregularly-shaped tongue of land, bounded by a river emptying into Massachusetts bay, without important elevations, generally flat and bordered by marshes. It can not be wondered at, therefore, that the governor, after a brief trial, removed to the inviting three-peaked promontory beyond the river and its inland bay. The departure of Governor Winthrop left Deputy Governor Dudley the leader of the settlers of the "Newe Towne"—a man worthy of the place and its singular restoration.

The work of public improvement began at once. In June, 1631, a canal was constructed by the enlargement of a natural creek, which still exists on the westerly side of College wharf, from the Charles river nearly to South street.

In February, 1632, the sum of 70 pounds was levied by the general court on the surrounding towns for the building of a "pallysade" around the "Newe Towne". The palisade was actually made, and the fosse which was then dug around the town is in some places visible to this day. Early in March the bounds of the "Newe Towne", as relating to Charlestown and Watertown, were defined by the court.

In August, 1632, a considerable accession was made to the population from mount Wollaston. This accession consisted of what is known as Hooker's company, from the name of its pastor, and word was sent to Mr. Hooker, then in Holland, to come over and unite himself with them again, which he accordingly did in 1633. A meeting-house, with a bell, had already been built.

The old division line between Charlestown and the "Newe Towne" was substantially that which now divides Cambridge from Somerville. That part of the town which lay to the eastward, now Cambridgeport and East Cambridge, passed under the general name of "the Neck", and was a waste of woodland, pasture, swamp, and marsh. Its main portion was divided into the Old Field and small Lot Hill. The upland and marsh, since built over by East Cambridge, went by the name of "Graves his Neck". Along the river to the southward stretched a succession of marshes, each having its special name. Access to Boston, indirectly, was through Charlestown or Roxbury, the rivers being crossed by ferries. Wood, in *New England Prospect*, describes it as "one of the neatest and best compacted towns in New England; the inhabitants, most of them, very rich". In 1633 the town regulations as to buildings were very strict.

The members of the church only were freemen and voters of the town. Congregationalism of the purest type dominated every thing. The town was taxed to support the minister. The meeting-house served its religious purpose on the Sabbath day and was used as the town-house on Monday. The meeting-house, and a wind-mill for grinding corn, were the first public buildings in the "Newe Towne". The first town officer was a constable, and the next a surveyor, charged with the care of highways. In 1634–'35 seven townsmen were appointed to manage all town affairs in their discretion; at the same time a board of surveyors was appointed—four men, with the constable—to make a survey of the town lands.

The "Newe Towne" in its earliest aspect was a little network of streets and lanes laid out in an upland surrounded by marshes, midway on the path from Charlestown to Watertown—a cluster of 40 or 50 houses centered about the meeting-house, with a population of a few hundred souls. Little by little discontent with quarters, confined in the most part to Mr. Hooker's company, took active form, and the removal of Mr. Hooker's company to Connecticut, in 1636, followed, by which time Mr. Shepard's company had arrived and organized themselves into a new church to take the place of Mr. Hooker's.

A project for the removal of the town to the Connecticut had received some countenance from the authorities, but an enlargement was proposed and accepted. This enlargement embraced Brookline, Brighton, and the present Newton. Brookline, then called Muddy Run, was granted on condition that Mr. Hooker and his congregation should not remove, and this grant was forfeited. In 1636 the court extended the bounds 8 miles into the country on the north, taking in the whole of the present Arlington and most, if not all, of Lexington, and again extended the bounds, in 1642, 1643, and 1644, so as to include Bedford and Billerica, thus spreading the "Newe Towne" from Dedham to the Merrimack river. Its extreme length was 25 miles, but its width, at the point of original settlement, barely 1 mile. One town after another has since been cut off, and ancient Cambridge, after temporarily swelling with the areas of half a dozen towns, has undergone a very nearly exact territorial restoration.

On October 28, 1636, the general court agreed to give £500 toward a college or school, of which £200 was to be paid the next year and £200 when the work was finished, the next court to appoint the place and character of the buildings. In November, 1637, the court selected "Newe Towne" as the place for the college, and in May, 1638, the town granted 2⅔ acres of land, being the forefront of the present college-yard toward the west, "for a public school or college forever". Fortifications remained to be completed, roads to be opened, but a public school or college there must be.

In 1638 the Rev. John Harvard, a dissenting minister, died, bequeathing to the projected college his library and the half of his other property, amounting to £1,500. In May, 1638, it was ordered by the court "that 'Newe Towne' shall henceforward be called *Cambridge*", and in March, 1639, the order followed, from the same authority, that the college should be called by Harvard's name. Other gifts to the college, both in money and books, followed.

Mr. Nathaniel Eaton was chosen "professor" in 1637, and under him was begun the first class in 1638. His abuses led to his ignominious discharge, and the Rev. Henry Dunster, who succeeded him in 1640, was really the first president of the college. Under him graduated the first class of 9 in 1642. In the same year a board of overseers was appointed, in whom were vested the funds and general management of the institution. A charter was granted by the court in 1650.

Cambridge had already been made one of the four towns in which the judicial courts were held. On the division into counties it was made the shire-town of Middlesex. The Cambridge press, established in 1639, was the first press in the English colonies of North America, and from 1640 to 1675 did all the printing for this country. In the midst of these interesting events was the beginning, also, of the public-school system, begun in a house on Holyoke street. In 1647 a stone school-house was built; this house was rebuilt in 1670 and replaced in 1700. In 1647 the townsmen took a census of the inhabitants and their estates, which showed: Ratable persons, 135; houses, 90; acres of broken land, 776; acres of unbroken land, 1,084; acres of marsh, 500; of meadow, 258; number of cows, 208; oxen, 131; horses, 20; sheep, 37; swine, 62; and goats, 58.

In 1649 the town voted to build a new meeting-house about 40 feet square. The ferry was replaced by the largest and first important bridge in the country, at a cost of £200. In 1682 Harvard hall was completed. Increase Mather became president in 1685, and continued the duties for sixteen years. He was largely mixed up in the political controversies of the period, and in the witchcraft delusion that rose to its highest pitch about this time the name of Mather is conspicuous above almost all others. A new charter came from the general court for the college, but the first uses of it were adroitly turned by the ambitious president to his own advantage. When afterward it was negatived by the crown, the affairs of the college were left in greater embarrassment than ever. He was displaced in 1701.

Of the social spirits of the town at this time a curious instance is given. It was voted by the freeholders in 1723 that no inhabitant should receive any person into his family for the space of a month without having the allowance of the freeholders or selectmen. In 1708, greatly to the disappointment of the Mathers, Mr. Willard had been succeeded in the presidency of the college by John Leverett, who held office until 1725, when he gave place to President Wadsworth. The Mathers withdrew from the affairs of the college, which flourished under the active and zealous administration of President Leverett. It was during this administration that the stream of Thomas Hollis' benefaction began to flow.

The year 1720 saw the completion of Massachusetts hall substantially as it appears to-day, which building, with Howard hall opposite and the first Stoughton against the eastward opening between the other two, formed the three sides of the college "quad". The president's house had been pulled down to make room for the new building, which was erected by legislative bounty at a cost of about £3,500, provincial currency ($4,800).

In 1721–'22 the general court was driven out from Boston and over to Cambridge, and, in turn, out of Cambridge, by small-pox, which pestilence raged again with an increased violence in 1730, breaking up the college exercises and scattering the students. Twice again, within a comparatively short time, were the exercises of the college similarly interrupted—in 1740 by a "throat distemper", and in 1750 by the small-pox again.

In 1741 a donation from a London family had enabled the erection of a chapel, which, bearing the name of Holden, stands to this day. In 1763 Hollis hall was completed. Howard hall was totally destroyed by fire January 24, 1764, and with it the library of over 5,000 volumes, including the collections of Dr. John Lightfoot and Dr. Theophilus Gale. A new Howard hall rose speedily, the general court responding generously to the emergency, and private gifts flowed in from all directions. The misfortune of 1764 having been thus repaired, the college was placed on a higher vantage-ground than ever before.

Up to 1759 there was but one church in Cambridge—the Congregationalist—but in this year intrusion came in the beginning of the building of Christ church, Episcopal, which was opened in 1761. Christ church was a new and shining center in the town, and was an introduction to the revolutionary chapter in the history of Cambridge.

The territory of Cambridge in 1776 presented the aspect of a broad and wholly rural tract of marsh-enveloped upland, bounded on the east by the broad Charles River basin, on the south by the river itself, and on the north by Willis creek, now Miller's river. Cambridge proper was a small village lying well back toward the western confines of the tract. Cambridge was "out in the country", and the roundabout ways of reaching Boston made the distance not less than 8 miles. From and after the 19th day of April, 1775, for nearly a year, Cambridge was the headquarters of the American army and presented all the aspects of a fortified camp. Its territory was the background to the battle of Bunker Hill and the base-line of the siege of Boston; its buildings were turned into barracks and hospitals, and within its precincts the commander-in-chief first unsheathed his sword and here established his home. Some of the college buildings were emptied of students and given up to the troops, and officers were lodged in private houses. An order was given by the general court for the removal of the college library and apparatus to Andover. On July 2, General Washington entered Cambridge, and took command of the army on the next day, as commemorated by the inscription on the stone under the "Washington elm".

On account of the exigencies of the situation the college had dispensed with a public commencement this summer, and contented itself with the conferring of degrees by "general diploma", and in the autumn the work

of the new college year was begun at Concord, where accommodations for 125 students were provided, and whither the library and apparatus were transferred from Andover. The first day of the new college year was signalized by the unfolding of the new Union flag of thirteen stripes—the first national symbol of the thirteen colonies.

The college was a principal sufferer from the military occupation, and its slow recovery and growth into an advanced influence may be regarded as giving shape to Cambridge history in the period immediately succeeding the Revolution. The patriotism of neither student nor government had been wanting from the outset. The governors and instructors were required to make satisfactory declarations to the overseers of their political principles. In the autumn of 1777 the peace of the college was again threatened by the arrival of Burgoyne's army, taken prisoners at Saratoga. Application was made by General Heath for the college buildings for the rank and file—"several thousands"—and the application was re-enforced by an order to clear the buildings for that purpose. But happily the execution of this plan was averted; the troops were provided for in barracks, the artillery was parked on the common, and for another year Cambridge was alive with military life, which had unfortunate effects upon both college and town. Quarrels, vice, and disorder abounded.

About 1771 the alphabetical arrangement of the students' names had been adopted, instead of the unrepublican arrangement by social rank which up to that time was the custom. The derangement of the public currency by the war made great havoc with the college funds, and it was not until 1795 that matters were finally settled. In 1780 the college was authorized by the constitution of Massachusetts to assume the title of University. In 1786 a college uniform was prescribed, and a distinction of classes by means of "frogs" on the cuffs and around the button-holes. The wearing of this uniform was compulsory, and continued a number of years. In 1772 the provincial legislature had authorized a lottery for the benefit of the college, with a view to the erection of a new building. The authority was extended, and in 1804 a sufficient sum had been realized to warrant a beginning of the building. The present Stoughton hall was the result. Holworthy hall, built by the proceeds of another lottery, was completed in 1813, and in the same year was laid the corner-stone of University hall. The office of college proctor was instituted in 1805, and between 1808 and 1815 solid foundations for the medical department were laid. At the same time the divinity school was in a state of transition from a mere professorship to an individual department, being perfected in 1830. In 1814 a separate church was organized within the college, and separate worship began in a chapel in University hall. In 1815 a professorship of law was founded by the bequest of the late Isaac Royall, and the full establishment of the law-school followed in 1817. The beginnings of the botanical garden were made in 1807. On September 8, 1836, was celebrated the bi-centennial of the founding of the college.

The period of nearly a half century which has elapsed since the bi-centennial celebration has been marked by the rapid enlargement of grounds, funds, faculty, buildings, system of instruction, appliances, and students, keeping Harvard in the front rank of the institutions of learning in the country. The most important of the changes in the organic life of the university have been the dissolution of the governmental tie with the commonwealth, effected in 1865, and the subsequent bestowal of control upon the whole body of the alumni (exclusive of the five youngest classes), which, since 1866, now elects the board of overseers. The university lands in Cambridge comprise about 60 acres, and 15 of these constitute the college "yard". The principal buildings number 36. The number of students averages about 1,300, of whom fully 800 are in the college proper. During the existence of the institution it has conferred upward of 13,000 degrees. Its faculty of instruction and administration embraces some 150 persons, while its scholarship and other beneficiary funds yield $40,000 a year.

In 1879 a plan was perfected whereby a full university course of study and systematic instruction by members of the faculty are to be secured to women, and some form of certificate will assure to those pursuing the course the credit of the honor they may have won.

The most immediate effect of the Revolution upon the social aspect of Cambridge was the breaking up and scattering of the circle of royalists, and in a town-meeting in 1783 the citizens gave explicit instructions to their representatives in the legislature to oppose any return of the proscribed royalists.

The first and most important step in the progress of the century was the building of the West Boston bridge, and the consequent opening of Cambridgeport to population and travel; the bridge was opened to the public in November, 1793, and cost $76,700. The opening of this bridge revolutionized the travel between Boston and Cambridge, and had instantaneous effect on the whole eastern part of the town. Lots were laid out, streets opened, buildings went up, canals were dug, dikes were built, and last, but not least, in 1805, with a view to further developments of the enterprise, an act of Congress was obtained making Cambridge a "port of entry". An elaborate and costly system of canals and docks was planned, and in part constructed, with a view to the improvement of the water-front, and preparations were made for the erection of large warehouses.

Mr. Andrew Craigie, who had been apothecary-general of the northern department of the Revolutionary army, bought up land at Lechmere's Point until, in 1807, he had some 300 acres, including pretty much the whole of what is now East Cambridge; then was built a bridge to Boston, known as Craigie's bridge, and under the auspices of a Lechmere Point corporation the opening of the whole precinct to settlement was vigorously prosecuted. Later a very brilliant stroke secured for this new quarter of the town the location of the county buildings. Meantime a spirited contest between Cambridgeport and East Cambridge, for the control of the travel

to and from Boston, was the means of opening the great thoroughfares which now traverse the city from east to west. The embargo proclaimed by President Jefferson in 1807, which arrested American commerce, burst the bubble which had been expanding glitteringly at the mouth of the Charles river, and the project of Cambridgeport as a *port* faded away. The war of 1812 gave another blow to the prosperity of both Cambridgeport and East Cambridge, and the character of each was materially affected, if not permanently changed.

The erection of Cambridge into a city was the result of a curious chain of circumstances, originating in the treatment of the common, and dating as far back as 1823. The common, which extended to Linnæan street, and which was not reduced within the boundary of Waterhouse street until 1724, had continued to be the property of the "proprietors of common lands" until 1769, when it was granted to the town on certain terms and conditions for public use forever, though the vested right of the town was not completed until 1828. In 1830, legislative authority was obtained for embellishing the common, but a town-meeting was called to oppose the fencing of it in. The court-house being so small, they adjourned to the meeting-house. In course of time the inclosing was effected, but the objections of the proprietors of the meeting-house to the use of their edifice for stormy town-meetings led the way to a project for a new town-house, and one was built at the corner of Harvard and Norfolk streets in Cambridgeport. This was a wooden structure, and was occupied from 1832 to 1853, in which latter year it was burned. Such a removal of the municipal center as this was of great advantage to Cambridgeport, and secondarily to East Cambridge. Old Cambridge, in 1842, asked of the legislature a division of the town, and the incorporation of that part lying west of Lee street into a separate municipality. The prevailing sentiment, being opposed to a division, proposed a city charter as the one measure to efface sectional feeling, and to bind all sections of the community into one harmonious whole; and in 1846 a city charter was granted and accepted. In 1811 the gap that had hitherto existed between old Cambridge and Cambridgeport was closed up, and similar improvements in later years had done much to bring East Cambridge into closer connection with the other parts of the city, which, although still spread over a wide area, is nevertheless acquiring compactness and unity.

Patriotic as Cambridge was in the Revolution, her national sympathies were sluggish in 1812; but when the war of the rebellion burst she sprang to arms with her old-time fervor. She organized the first company of militia in the United States which was enlisted for the defense of the government. Captain Richardson, grandson of Moses Richardson, one of the slain of the 19th of April, 1775, reported his company, 95 strong, April 17, 1861, and, at the expiration of its three months' service, nearly all the number re-enlisted. In all, Cambridge furnished to the Union army 4,135 men, and to the navy 453—about one-sixth of its population—while the memory of 30 officers and 310 enlisted men is perpetuated by an imposing monument on the common, erected by the city.

The Gas Company was incorporated in 1852. The city purchased the water-works in 1865. An ordinance establishing sewers was passed in 1852. The horse-railroad was opened to Boston in 1854. The first street-paving was in 1856, and the laying of brick sidewalks, under assessment, was in 1869.

The University press and Wilson's press, now united, and the Riverside press, constituted a distinguished trio of printing-houses and binderies that turned out as good work as any produced in the country. The manufacture of glass began in 1815, and has grown to large proportions. The soap-factories and meat-packing establishments are in the eastern precincts of the city. Along the water-front are groups of rolling-mills, founderies, boiler-works, and machine-shops. Around the west-end cemeteries are granite and marble-cutting yards. The manufacture of cigars, plain and fancy crackers, and cabinet organs is carried on, while the telescopes constructed by Abram Clark and Sons, whose shops and observatories constitute a picturesque group of buildings at the extreme southerly point of the city, have a world-wide reputation. A large business is done annually in Fresh Pond ice.

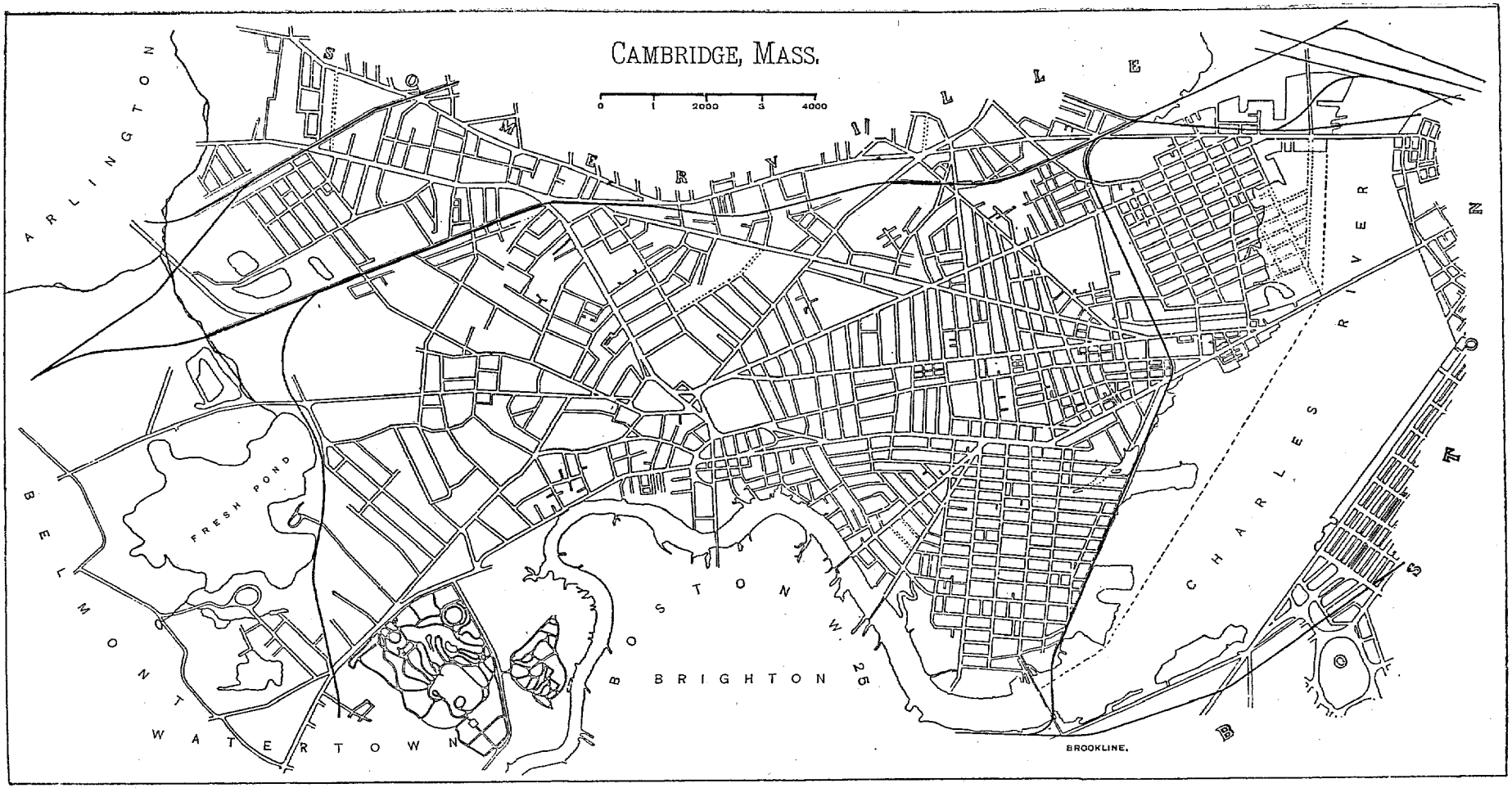
Cambridge has never been seriously ravaged by fire, and its periods of depression have been the same as those affecting the country at large. The population of one nationality has not to any extent supplanted others previously established, but has in some portions of the city become more prominent, the cause being indirectly from the nature of the manufacturing industries carried on.

CAMBRIDGE IN 1880.

The following statistical accounts, collected by the Census Office, indicate the present condition of Cambridge:

LOCATION.

Cambridge lies in latitude 42° 23′ north, longitude 71° 7′ west from Greenwich, on the Charles river, directly adjacent to the city of Boston on the west. The average altitude above sea-level is 39.5 feet, the lowest point being the marshes, covered at high water, and the highest 77 feet above sea-level. The Charles river is here navigable only in part, with a depth in the channel at high water of from 10 to 28 feet. Water communication is had with Boston, Chelsea, Brookline, and Watertown, Massachusetts.


CAMBRIDGE, MASS.
0 1 2000 3 4000
ARLINGTON
SOMERVILLE
CHARLES RIVER
FRESH POND
BELMONT
WATERTOWN
BOSTON
BRIGHTON
BROOKLINE.

RAILROAD COMMUNICATIONS.

Cambridge is touched by the following railroads:
The Boston and Albany railroad.
The Boston and Lowell railroad.
The Fitchburg railroad.
The Boston and Lowell railroad comes into the extreme eastern section, and the Fitchburg railroad into the western portion of the city, while the Boston and Albany railroad has a station just across the Charles river to accommodate the southern part.

TRIBUTARY COUNTRY.

The immediate vicinity of the city is taken up by gardens that are devoted to the purpose of raising early vegetables, etc., for the Boston market. Owing to its nearness to Boston, Cambridge can not be said to have much local trade with the surrounding country.

TOPOGRAPHY.

Cambridge is situated in the midst of a plain extending back from the Charles river, with Boston on the east, Brookline and a portion of Boston on the south, Somerville on the north, and Watertown, Lamont, and Arlington on the west. The soil is sand, gravel, and clay; in some sections exist extensive beds of clay, and in others the sand and gravel is often underlaid by clay. The underlying rock is supposed to be slate, cropping to the surface at a few points. The variations of level are some 77 feet, and the drainage, in former times, was by open courses to the river, which runs along the southern boundary of the city. The surrounding country is open, has some large tracts of marshes, and the elevations are higher than in the city, ranging from 100 to 200 feet. The soil is good and highly cultivated. There is but one pond of any size within the city limits.

CLIMATE.

From records covering the past ten years the highest summer temperature is 94.8°; highest summer temperature in average years, 92.7°; lowest winter temperature, —13.6°; lowest winter temperature in average years, —5.7°. The influence of the adjacent waters tempers the extremes of heat and cold, while the marshes near the city render the air humid. The prevailing winds are from the west and northwest, tending to make the air dry and healthy, and the elevated lands break the force of strong winds.

STREETS.

The total length of streets is 85 miles, paved as follows: Cobble-stones, 0.38 mile; stone blocks, 1.61 mile; broken stone, 12 miles; and gravel and dirt roads, 71.01 miles. The stone blocks cost $2 25 and the cobble-stones $1 50 per square yard. Gravel costs 85 cents per cubic yard at the pit. The sidewalks are of brick and gravel, and the gutters, 4 feet wide, are of cobble-stones. The construction and repair of streets cost from $40,000 to $75,000 annually. The paving is done by contract, and all street work is done by the day. A steam stone-crusher is used, and is found very economical in using up the stone from the gravel-pit. There is one horse-railroad with 40 miles of track in the city, 175 cars, and 1,100 horses in use, and giving employment to 400 men. The number of passengers carried during the year is 8,572,000, the average rate of fare being 5¼ cents.

WATER-WORKS.

The water-works are owned by the city, and cost $1,721,830 54. The water is taken from Fresh pond, partly within the city limits, and is raised into a reservoir and stand-pipe by two Worthington engines of an aggregate capacity of 5,000,000 gallons a day. The pressure in the distributing-pipes from the reservoir is 28 pounds, and from the stand-pipe 48 pounds, to the square inch. The average daily amount of water pumped is 2,700,000 gallons, and the cost of raising 1,000,000 gallons 1 foot high is 7 cents. The yearly cost of maintenance, aside from the cost of pumping, is $16,226 14, and the income from water-rates, $173,325 49. Meters are used for manufacturing establishments only, 156 in number. Water is supplied to 10,000 families, 743 stables, 412 shops, stores, etc., 579 hydrants, 14 fire-reservoirs, 17 drinking-fountains, and 38 stand-pipes for street-watering.

GAS.

Gas is supplied by a private corporation to consumers at the rate of $3 per thousand. The city pays $2 25 per thousand for the gas for street-lamps, 769 in number.

PUBLIC BUILDINGS.

The city owns and occupies for municipal purposes, wholly or in part, buildings valued at $891,802 75, including city hall, city buildings, ward-rooms, school-houses, engine-houses, almshouse, etc. The city hall is valued at $30,000, and is owned and occupied wholly by the city.

PUBLIC PARKS AND PLEASURE-GROUNDS.

There are 16 commons, parks, and squares in the different sections of the city, with an aggregate area of 17 acres. The largest, *Cambridge Common*, between North avenue and Garden and Waterhouse streets, area 8½ acres, is level, well grassed over, and laid out in walks and provided with seats. The soldiers' monument occupies a place in the center. The parks are controlled by the city council, and are under the immediate care of the committee on public property. Each member of this committee has the parks or squares nearest his own residence under his special supervision. The annual appropriation for care and maintenance is from $3,500 to $4,000.

PLACES OF AMUSEMENT.

There are no theaters in the city. Union hall, with a seating capacity of 1,500; Temple hall, seating 600; Institute hall, seating 500; Gothic hall, seating 500; and Lyceum hall, seating 450, are used for traveling exhibitions, concerts, balls, etc. None of these halls pay any license to the city.

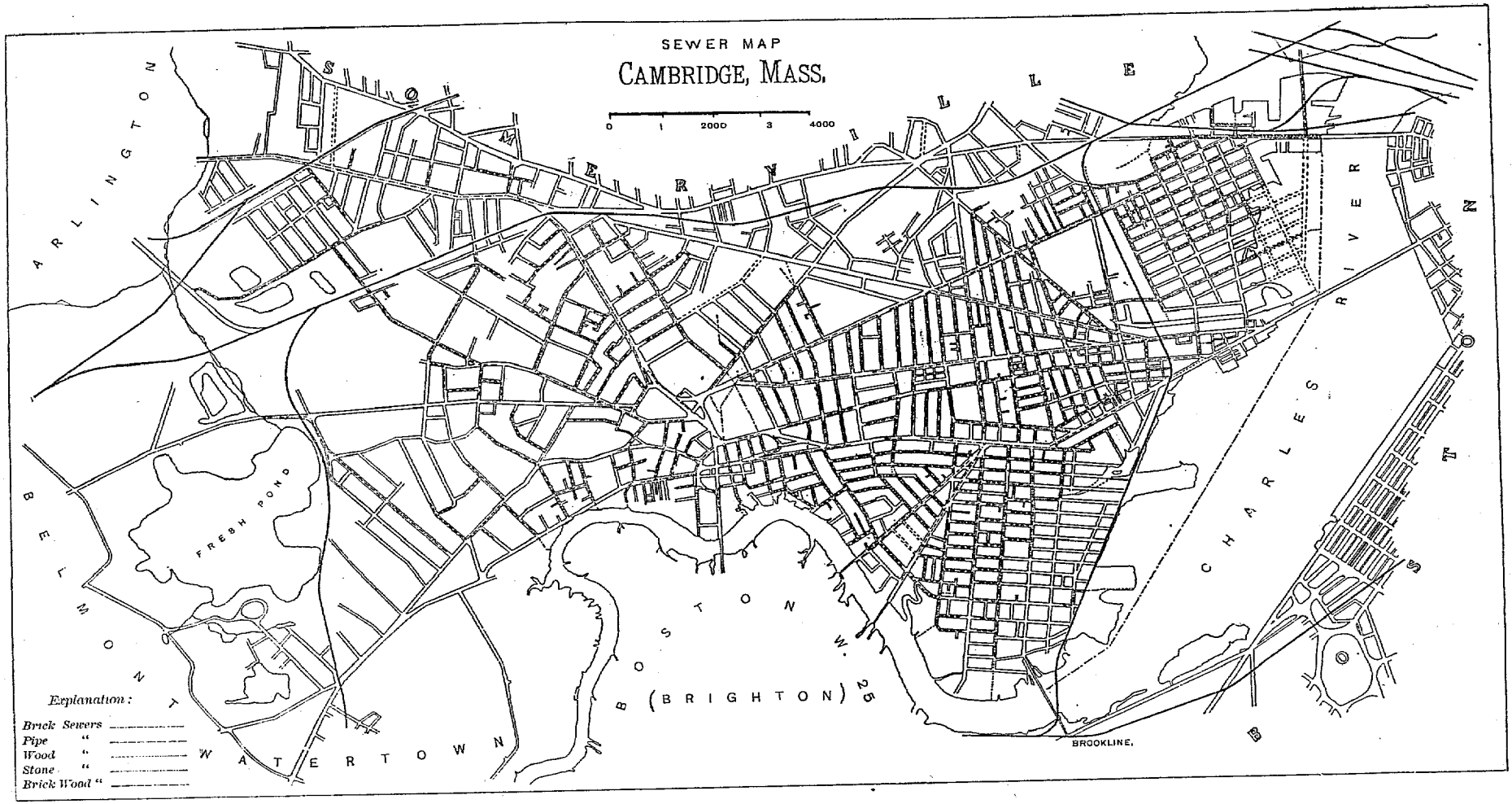
DRAINAGE.

The natural drainage of Cambridge is principally into the Charles river. This tidal stream, where it separates Cambridge from Brighton, Brookline, and Boston, is about 400 feet wide, but opposite Boston it enlarges to a width of half a mile and is sometimes called the Back bay. The city of Boston within the past twenty years has filled in the shoals on its side of the river, making a substantial addition to the city area. On the Cambridge side, also, some of the flats have been reclaimed, but still at low tide the water retreats into a narrow channel, leaving exposed banks of mud from 800 to 1,000 feet wide. A small tidal stream, known as Alewife brook, connecting with Mystic river, receives considerable surface drainage, and also the discharge from three main sewers, draining a large suburban district.

Most of the sewers, including those in the most densely populated part of the city, discharge into the Charles river. There are three large outlets, 90 by 96 inches, and numerous smaller ones discharging their contents all along the city water-front. Outfalls are usually built of wood and furnished with self-acting tide-gates; they discharge between high and low water, only one outfall being entirely submerged. Tide-gates are usually a simple flap hinged at the top and closing by their own weight, but in some of the larger outlets more elaborate structures have been built. The chambers are circular, 6 feet 6 inches in diameter. The gates are in pairs, swinging on hinges at the sides, and closing against miter frames of oak timber. One pair of gates is placed between the two circular chambers, and one at the entrance from the sewer. The outfall is of timber and is 4 feet square.

In some parts of the city sewers are built according to a regular system, but in the older part the existing sewers are extended according to circumstances. A large proportion of the streets is already sewered. The material in most common use is brick, or a combination of brick and timber. There are 3 miles of sewers built of wood, with rectangular cross-sections. About 3 miles consist of vitrified clay pipe of small size, from 8 to 12 inches in diameter. Somewhat more than 12 miles are of cement pipe of various sizes, from 10 inches to 18 inches. This kind of pipe is not proving satisfactory in all cases, as it sometimes disintegrates. The city engineer in his report of 1880 alludes to "more failures in the cement pipe", and mentions one of 12 inches diameter in Franklin street which was badly disintegrated, and was replaced by Akron pipe. Another, in Walden street, 18 inches diameter, was replaced by a brick sewer. Most of the sewers are built of brick and are of various shapes and sizes; some are circular and consist of one or two rings of brick, according to the size. Many sewers consist of a semicircular bottom and vertical side-walls of brick covered with flat-stones. Quicksand is encountered in many places, and special devices have to be used to build sewers that will not be destroyed by unequal settlement. One favorite shape in which many sewers are built is a flat bottom of plank, with side-walls of heavy timber supporting a semicircular arch of brick. Some large sewers consist of two or three rings of brick, according to the size of the sewer, built on skewbacks of long timbers 12 inches by 12 inches, securely treenailed together and kept from spreading by exterior braces at intervals, all resting on a platform of 8-inch timbers laid crosswise. The sewer in Sixth street is of this pattern, is nearly circular in cross-section, 9 feet 4 inches wide and 8 feet high, with three rings of brick. The timber sides are 2 feet 6 inches high, and spread at an angle of about 20 degrees. About 3½ miles of brick sewers are built upon hollow invert blocks of cement or of vitrified clay, which are doing good service and have proved satisfactory. When the ground is soft or very wet the invert blocks are laid on 3-inch by 12-inch planks, two being laid side by side for the purpose. A sewer of this pattern in Harvard street is 5 feet wide by 5 feet 6 inches high, and consists of two rings of brick. Another, in Brewery street, is 4 feet high by 3 feet 6 inches wide, also built on invert blocks.

Very little flushing is said to have been found necessary, as the sewers receive nearly all the storm-water. No reliable information can be secured about the cost of flushing or removing deposits, as so little of that kind of work has been done. Storm-water is admitted through catch-basins, costing, since 1876, from $42 50 to $67 50 each, not including the cost of connecting with the sewer, which would add from $20 to $40, according to distance and depth.


SEWER MAP
CAMBRIDGE, MASS.
0 1 2000 3 4000
SOMERVILLE
ARLINGTON
BELMONT
WATERTOWN
FRESH POND
BOSTON
(BROOKLINE)
BROOKLINE
CHARLES RIVER
Explanation:
Brick Sewers
Pipe "
Wood "
Stone "
Brick Wood "

Sewers are usually laid from 5 to 10 feet deep. Manholes are built of elliptic cross-section 5 feet long by 3 feet wide, and cost, including the cast-iron curb and cover, about $35 each. There is no provision for ventilation except perforated manhole covers. Inlet-basins are trapped.

The total length of sewers in 1880 is 61.667 miles. The total cost up to 1878 was $805,061, of which 35 per cent. was assessed upon property-owners and the remaining 65 per cent. paid by the city. The funded sewer debt of the city is $624,000, at 6 per cent. interest, the bonds having from twenty to thirty years to run. For many years an assessment of 50 cents per foot front was laid upon property on each side of the street where a sewer was built, without regard to the size or cost of the sewer or the value of the property assessed. The city now pays one-fourth the cost of all sewers, and the remaining three-fourths is assessed upon property benefited, according to the judgment of the mayor and aldermen. An elaborate report and discussion on the subject of sewer assessments was presented by a special committee, and published in the city documents of 1880.

STATEMENT RELATING TO SEWERS BUILT IN 1879 AND 1880.

Sewer on Putnam avenue, built in 1879, of 10-inch Akron pipe, with 7 inlets, 92 feet in length; total cost, $56 85.

Sewer on Gardner street, built in 1879, of 10-inch Portland pipe, with 15 inlets, 200 feet in length; total cost, $124 05.

Sewer on Waverly street, etc., to the Charles river, built in 1879, of brick and wood (16 by 22, 24 by 30, and 40 by 42 inches), with 3 manholes, 24 inlets, and 2 gate-chambers, 1,383 feet in length; total cost, $3,762 23.

Sewer on Dover street, built in 1879, of 12-inch Portland pipe, with 1 manhole and 19 inlets, 413 feet in length; total cost, $243 72.

Sewer on Lawrence street, built in 1880, of 12-inch Portland pipe; manholes at $35 each; cost of sewer, 50 cents per foot.

Sewer on Buckingham street, built in 1880, of 10- and 12-inch Portland pipe; manholes at $44 44 each; cost of sewer, 67 and 72 cents per foot.

Sewer on Follen street, built in 1880, of 10-inch Akron pipe; manholes at $43 each; cost of sewer, 72½ cents per foot.

Outfall sewer, built in 1880, of brick, 30 by 36 inches, oval, with pile and timber foundation, haunches backed with brick; cost, about $7 42 per foot, which amount includes manholes, inlets, etc. Receives intercepted and pumped sewage from a large district, for which this is the outlet for a part of the time only. Built by day work by the city.

CEMETERIES.

There are 3 cemeteries and 1 burial-ground in Cambridge, as follows:

Cambridge Cemetery.—Situated in the extreme southwestern portion of the city near Charles river, and next to Mount Auburn Cemetery; area, 40.8 acres.

Mount Auburn Cemetery.—Only 11.7 acres are in Cambridge, the balance being in Watertown, and the cemetery is described in the statistical account of Boston.

Cambridge Catholic Cemetery.—Situated on Spruce street in the fifth ward; area, 7 acres.

The Old Burial-ground.—On North avenue and Church street, near the college; area, about 2 acres; is now no longer used for interments.

The total number of interments in the Cambridge cemetery is 11,936; in the Catholic, 6,000; and in that portion of Mount Auburn inside the Cambridge limits, 1,050; or 18,986 all told. It is estimated that some 500 interments have been made in the Old burial-ground, and among these are the remains of those who fell during the march of the British troops to Lexington, April 19, 1775. Burial permits are issued by the city clerk on physicians' certificates approved by the board of health. Undertakers are appointed annually by the mayor and aldermen, and they are charged with the proper conduct of all funerals. No interments can be made between sunset and sunrise unless a permit be obtained from the board of health, and no grave must be less than 3 feet deep from the surface of the ground to the top of the coffin.

MARKETS.

There are no public or corporation markets in the city. The inhabitants procure all their supplies from retail dealers, who in turn deal directly with Boston.

SANITARY AUTHORITY—BOARD OF HEALTH.

The chief sanitary authority in the city is the board of health, elected annually by the city council, and composed of three members—the city physician and two members not belonging to the city government. The city physician receives a salary, but not as a member of the board, and the other two serve without compensation. The laws of the state make the board independent of the city government, except so far as appropriations are concerned. The annual expense, in absence of any declared epidemic, is $1,500 for salaries of clerk and health officer, advertising and incidentals, and during the prevalence of any epidemic the expenses may be increased by the city council to any

amount. In absence of an epidemic the board has authority to abate all nuisances and has general sanitary care of the city, and in case of an epidemic may take such action as may be deemed necessary to check and control the same. The chief executive of the board is the health officer, at a salary of $1,000 a year. He is appointed by the board, carries out all orders given him, and sees that the health ordinances are properly enforced. The health officer is a physician, and has the same powers as a policeman. Inspections are made regularly in all parts of the city, and also as nuisances are reported to the board. When a nuisance is found or reported, the health officer inspects it, and either orders it abated and sees that the order is obeyed, or else reports the matter to the board. Defective house-drainage, privy-vaults, cesspools, sources of drinking-water, etc., are treated in the same manner as nuisances. The same can be said of defective sewerage and street-cleaning. The board has general supervision over all interments and approves all certificates of death. The removal of excrement is regulated by the board.

INFECTIOUS DISEASES.

Small-pox patients are quarantined at home, or, if in indigent circumstances, are removed to a special hospital which is provided for the purpose. Scarlet-fever patients are isolated at home. The board takes cognizance of the breaking out of contagious diseases in the public schools, and regulates attendance. Vaccination is compulsory, and in case of paupers is done at the public expense. The registration of diseases, births, and deaths is governed by the state laws and is done by the city clerk.

REPORTS.

The board reports annually to the city council, and the report is published with the regular city documents.

MUNICIPAL CLEANSING.

Street-cleaning.—The streets are cleaned at the expense of the city and with its own regular force. The work is done wholly by hand, no sweeping-machines being used. The streets are cleaned four times a year, and the work is efficiently done at a cost of $5,000 a year. The sweepings are used for filling in low lands, and, as the city has a considerable area of these, the place of final deposit is found very convenient.

Removal of garbage and ashes.—The city removes all garbage and ashes from the houses in Cambridge with its own force. The garbage and ashes must be kept in separate boxes convenient for removal, and are taken once a week, the former being sold to farmers and the latter treated the same as street-sweepings. The annual cost to the city for this service is $10,000, and the system is reported as working well.

Dead animals.—The carcasses of all animals dying within the city are removed under direction of the board of health. The larger ones (horses, cows, etc.) are sold to rendering-establishments, while the smaller ones are buried. No separate account is kept of this service, and the cost to the city is not known.

Liquid household wastes.—Nearly all the liquid household wastes in the city are run into the public sewers, none being allowed to pass into the gutters. Cesspools are used, and in many cases they are connected with the sewers by overflows. In some cases they receive the wastes from water-closets, and in their construction and manner of cleaning they are governed by the same ordinances as privy-vaults.

Human excreta.—Nearly all the houses in the city are provided with water-closets, the majority of which deliver into the sewers. All vaults (and cesspools) must be laid in brick and cement, and must be large enough to contain 80 cubic feet. The inside must be at least 2 feet from any party line, and they must be built so as to be easily approached, opened, and cleaned. They are emptied, when offensive, under permits from the board of health, between the hours of 9 p. m. and 4 a. m. The odorless-excavator process is recommended. The night-soil is taken outside the city limits and used for manuring land, none of it being allowed within the gathering-ground of the public water-supply.

Manufacturing wastes.—Nearly all the manufacturing wastes pass into the sewers.

POLICE.

The police force of Cambridge is appointed by the mayor and aldermen, and governed by the committee on police, consisting of the mayor and three aldermen. The chief of police is the executive officer, has entire control of the members of the force while on duty, and is responsible for their discipline and efficiency. His salary is $1,600 per annum. The force consists of 4 captains, at $1,000 a year each, 6 sergeants, at $2 62 a day each, and 46 patrolmen, at $2 50 per day each. The uniform consists of a blue dress-coat, vest, and trowsers, with cap. In the summer a dark straw hat is worn, and in winter the men wear blue overcoats. The uniform costs, complete, $75, and each man provides his own. Each patrolman carries a club and a revolver. The hours of service are from 9 p. m. to 4 a. m., 4 a. m. to 12.30 p. m., and 12.30 to 9 p. m., and all the streets in the city are patrolled by the force. During the past year there were 1,479 arrests made by the force, the principal causes being drunkenness, assaults, larceny, violations of the city ordinances, disturbances, and vagrancy. Most of these cases were disposed of by fines, some of the vagrancy cases being sent to the work-house. During the same time the amount of property either lost or stolen and reported to the police force was $6,117 80, and of this $3,120 67 was recovered and returned to the

owners. During the year there were 1,522 station-house lodgers, as against 2,772 in 1879, a reduction in this undesirable class of the population of nearly 50 per cent. Special policemen are appointed by the mayor and aldermen when deemed expedient, and when on duty are clothed with the same power as the regular force. The yearly cost of maintenance for the department (1880) is $56,083 61.

FIRE DEPARTMENT.

The regular force of the fire department consists of 1 chief and 3 assistant engineers, 60 members of steamer companies, 28 members of hook-and-ladder companies, 1 relief engineer, 1 extra driver, and 2 telegraph operators, making a total of 96. The apparatus consists of 5 steam-engines with hose-carriages, 2 hook-and-ladder trucks complete, and 1 supply hose-carriage in active service, and 2 steam fire-engines in reserve. There are 21 horses and 11,800 feet of hose in use. Water for fire purposes is taken from 579 hydrants and 14 reservoirs. The fire-alarm telegraph has 85 miles of wire, with 61 street signal-boxes. The yearly appropriation for the department ranges from $50,000 to $52,000. During the year ending January 1, 1880, there were 79 fires. The value of the property destroyed was $70,419 24, and the amount of insurance paid was $66,313 63.

MANUFACTURES.

The following is a summary of the statistics of the manufactures of Cambridge for 1880, being taken from the tables prepared for the Tenth Census by Simeon Snow, special agent:

Mechanical and manufacturing industries.	No. of establishments.	Capital.	Average number of hands employed.			Total amount paid in wages during the year.	Value of materials.	Value of products.
			Males above 16 years.	Females above 15 years.	Children and youths.			
All industries	379	$6,480,799	6,205	1,172	166	$3,416,470	$20,101,349	$26,605,688
Blacksmithing (see also Wheelwrighting)	26	29,450	54	.....	.....	27,760	26,900	81,790
Bookbinding and blank-book making	4	144,000	81	109	1	78,703	100,730	202,485
Boots and shoes, including custom work and repairing	6	31,250	20	5	4	11,684	25,232	47,109
Bread and other bakery products	19	121,600	170	80	47	113,881	346,732	579,856
Brick and tile	7	457,000	363	.....	13	73,239	120,700	217,930
Brooms and brushes	4	34,500	47	33	.....	19,730	75,203	124,281
Carpentering	37	100,350	243	.....	.....	134,896	298,420	491,551
Carriages and wagons (see also Wheelwrighting)	13	148,600	104	.....	.....	62,443	75,121	161,586
Confectionery	4	76,000	49	42	.....	29,200	153,000	203,800
Cooperage	4	42,500	116	.....	10	64,800	77,500	155,500
Drugs and chemicals	3	235,000	31	13	2	21,400	194,000	300,000
Furniture (see also Mattresses and spring beds)	12	275,000	562	11	5	264,765	233,658	615,191
Foundery and machine-shop products	9	137,734	231	.....	.....	128,029	344,890	509,326
Leather, curried	5	104,000	140	.....	5	70,915	601,860	753,000
Marble and stone work	14	98,050	110	1	.....	54,865	30,326	113,798
Masonry, brick and stone	20	100,275	216	.....	.....	104,852	233,870	388,030
Mattresses and spring beds (see also Furniture)	3	29,000	32	1	4	11,270	24,500	53,000
Musical instruments, organs and materials	5	593,000	481	15	15	326,090	292,556	783,222
Musical instruments, pianos and materials	7	54,200	145	9	6	79,870	67,990	161,900
Painting and paperhanging	25	27,100	86	2	.....	38,285	30,800	95,510
Photographing	3	3,300	4	4	.....	1,950	2,050	8,000
Plumbing and gasfitting	6	11,700	23	.....	.....	12,049	27,806	56,325
Printing and publishing	15	313,200	485	341	5	404,789	109,993	785,443
Roofing and roofing materials	5	4,000	14	.....	.....	6,300	14,100	26,400
Saddlery and harness	7	5,300	13	.....	.....	6,750	8,450	21,500
Slaughtering and meat-packing, not including retail butchering	5	560,500	483	.....	.....	228,800	6,434,700	7,179,625
Soap and candles	13	375,500	222	.....	28	101,096	1,602,696	1,963,604
Tinware, copperware, and sheet-iron ware	14	50,100	50	.....	.....	25,772	33,200	70,410
Tobacco, cigars, and cigarettes	11	14,100	35	6	.....	20,546	22,415	52,350
Wheelwrighting (see also Blacksmithing; Carriages and wagons)	8	8,850	17	.....	.....	11,540	11,100	30,700
Wood, turned and carved	6	18,800	79	7	4	44,800	54,200	126,750
All other industries (a)	50	2,276,840	1,490	493	17	835,401	8,427,751	10,225,716

a Embracing boxes, wooden packing; bridges; cars, railroad, street, and repairs; cheese and butter (factory); clothing, men's; coffins, burial cases, and undertakers' goods; collars and cuffs, paper; cordage and twine; cutlery and edge tools; flavoring extracts; food preparations; flouring- and grist-mill products; hardware; instruments, professional and scientific; iron bolts, nuts, washers, and rivets; iron pipe, wrought; iron and steel; lard, refined; leather, tanned; lime and cement; liquors, distilled; looking-glass and picture frames; mats and matting; mineral and soda waters; models and patterns; musical instruments and materials (not specified); pumps; rubber and elastic goods; safes, doors, and vaults, fire-proof; sash, doors, and blinds; shipbuilding; sporting goods; springs, steel, car, and carriage; stamped ware; steam fittings and heating apparatus; stone- and earthen-ware; sugar and molasses, refined; trunks and valises; upholstering; vinegar; and window blinds and shades.

From the foregoing table it appears that the average capital of all establishments is $17,099 73; that the average wages of all hands employed is $452 93 per annum; that the average outlay in wages, in materials, and in interest (at 6 per cent.) on capital employed is $63,078 27.

CHELSEA,

SUFFOLK COUNTY, MASSACHUSETTS.

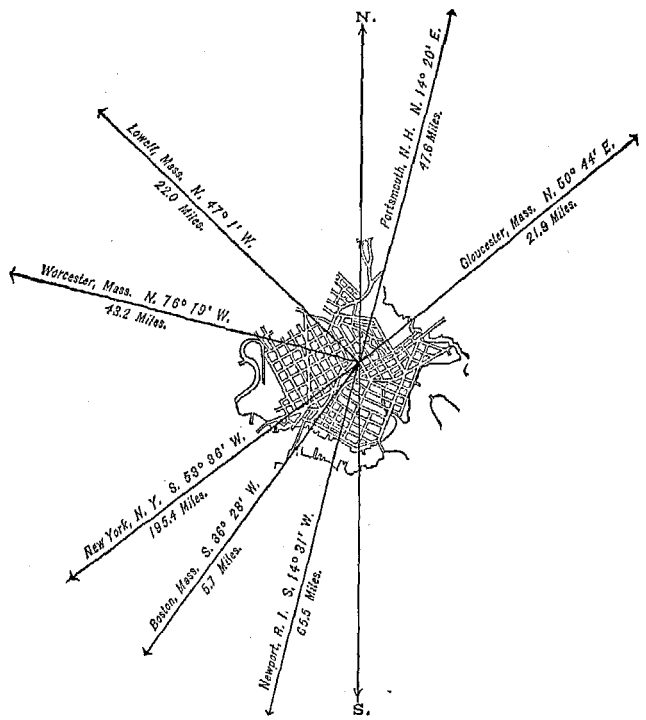
POPULATION

IN THE

AGGREGATE,

1800-1880.

	Inhab.
1790	
1800	849
1810	594
1820	642
1830	771
1840	2,390
1850	6,701
1860	13,395
1870	18,547
1880	21,782



POPULATION

BY

SEX, NATIVITY, AND RACE,

AT

CENSUS OF 1880.

Male	10,023
Female	11,759
Native	17,187
Foreign-born	4,595
White	21,250
Colored	*532

* Including 18 Chinese.

Latitude: 42° 25′ North; Longitude: 71° (west from Greenwich); **Altitude: 0 to 220 feet.**

FINANCIAL CONDITION:

Total Valuation: $15,377,402; per capita: $706 00. Net Indebtedness: $1,554,496; per capita: $71 37. Tax per $100: $1 98.

HISTORICAL SKETCH.

Chelsea was first settled about 1630. The territory occupied by the present city remained a farming district until 1830, when its growth began as a suburb of Boston. Originally a part of Boston, under the name of "Rumney Marsh", it was made a town and named Chelsea in 1738; divided in 1846, the original village received the name of North Chelsea (now the towns of Winthrop and Revere). A city charter was granted in 1857. The population has come from the outflow of Boston. Its earlier growth was delayed for want of easy communication with that city. A steam ferry and horse-cars have supplied the deficiency, and the city has received its growth in the last forty years. No serious fires or periods of depression have occurred.

CHELSEA IN 1880.

The following statistical accounts, collected by the Census Office, indicate the present condition of Chelsea:

LOCATION.

Chelsea lies in latitude 42° 25′ north, longitude 71° west from Greenwich, at the head of Boston upper harbor, where the Mystic and Chelsea rivers empty into the bay, 5 miles northeast from Boston common. The elevations are from sea-level to 220 feet above. The channel between Charlestown and East Boston leading up to Chelsea has a depth of 33 feet, and the depth of water at the wharves ranges from 14 to 24 feet, the latter being on the Mystic side. These depths are at mean low-tide. The rise and fall of the tide, currents, and points to which communication is open by water are the same as those of Boston.

MEANS OF COMMUNICATION.

The Eastern railroad, between Boston and Portland, Maine, passes through the city, affording constant communication with both cities. A steam ferry runs direct to Boston.

TOPOGRAPHY.

Chelsea is situated on a peninsula formed by the Mystic river and Chelsea river just north of East Boston and northeast of Charlestown, bridges connecting it with both places. Malden lies on the west and North Chelsea on the north; it is practically a suburb of Boston. The city is built on a ridge running from northeast to southwest. The city is almost surrounded by marshes, cut up by several small streams, into which sewers once had their outlets. The western slope drains into the Island End river, a small tributary of the Mystic, while the rest of the city is drained by the Chelsea river, which winds around two sides of it, separating it from East Boston and partly from North Chelsea. The soil is mostly gravel, with a clay and clayey-rock hard-pan. The surrounding country is well settled.

CLIMATE.

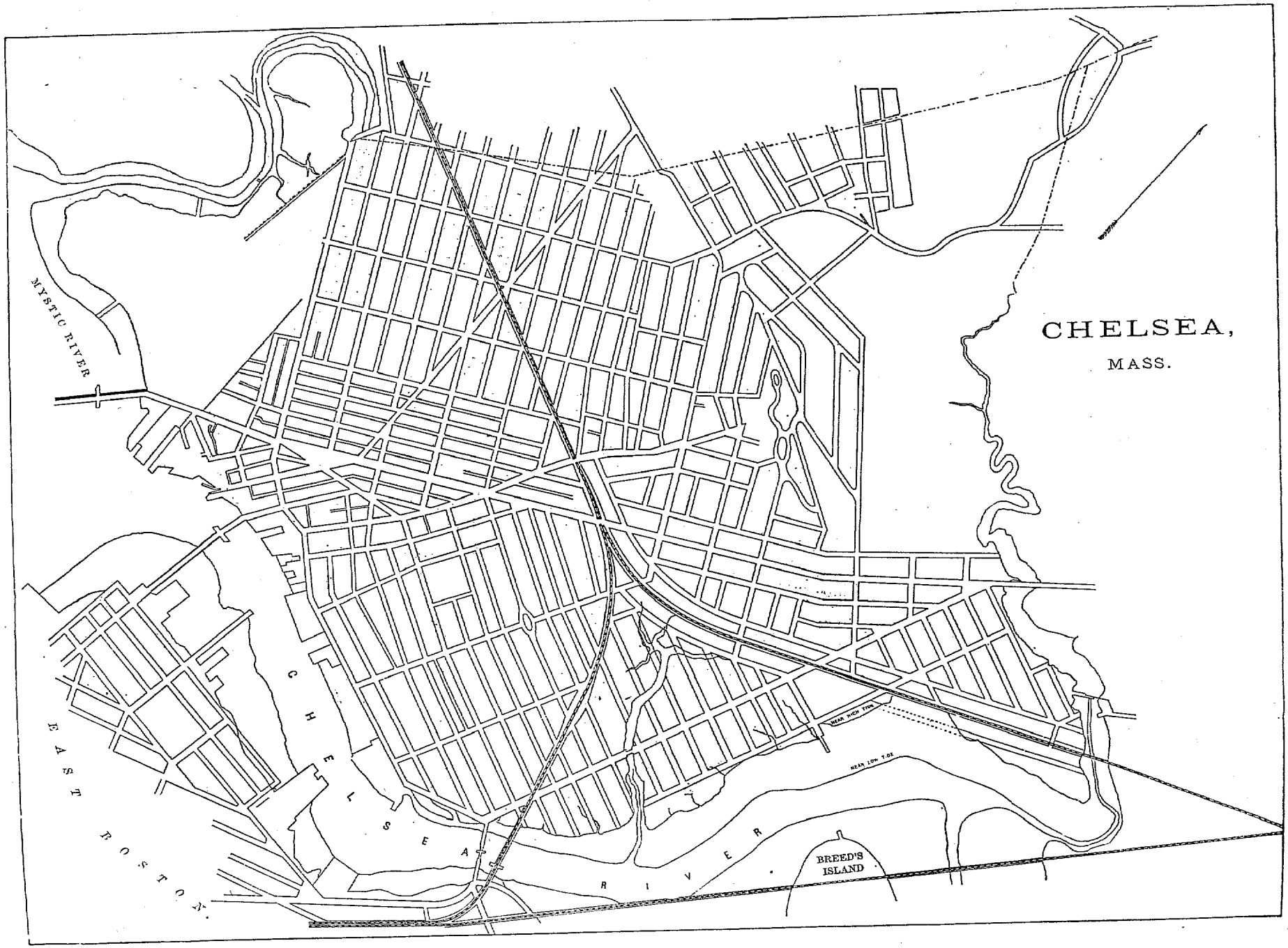
Highest recorded summer temperature, 98°; highest summer temperature in average years, 94°. Lowest recorded winter temperature, —18°; lowest winter temperature in average years, —7°. The changes in temparature are frequent and sudden, owing principally to cold east winds. The extremes of heat and cold, however, are moderated to a certain extent by the proximity of the Atlantic.

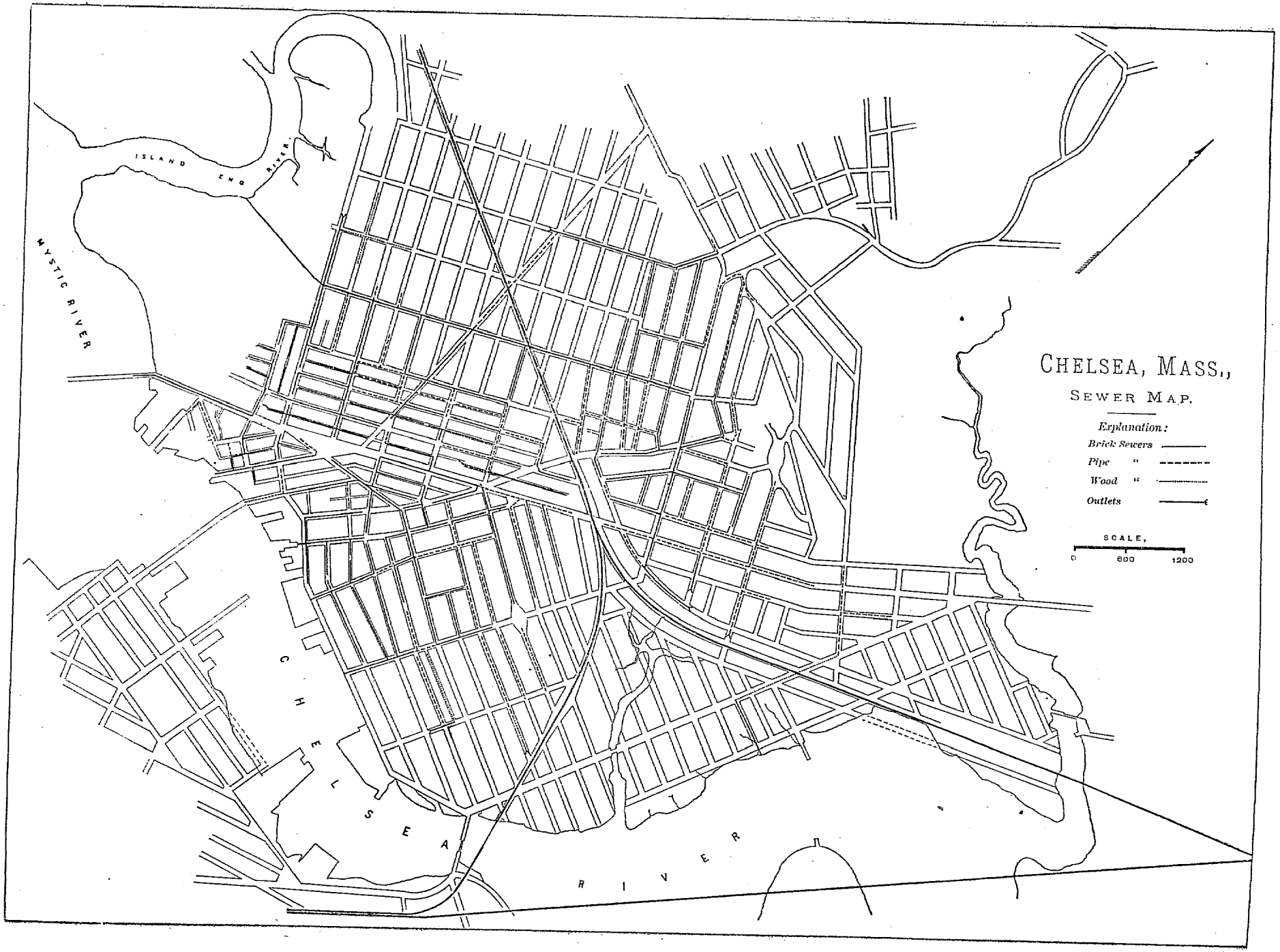
STREETS.

There are 28 miles of streets in the city. Of these, 1,050 feet are paved with cobble-stones and 7,600 feet with granite blocks; the rest are finished in gravel. The cost per square yard is, for cobble-stones, $2, and stone blocks, $3. The cost of keeping each in good repair was not stated, no separate account being kept. The stone blocks, in reference to quality, permanent economy, and relative facility with which each is kept cleaned, are deemed the best, with the cobble-stones next. Gravel is reported as fair in dry weather, bad in spring and fall, and only slightly muddy in wet weather. The sidewalks are mostly of gravel, some of brick, and some of asphalt; the latter is generally in bad condition; the gravel does not give satisfaction, while the brick walks are the easiest to maintain. About 10 miles of streets have gutters paved with cobble-stones laid to a granite curbing. In half the streets of the city trees have been planted along both sides, on the outer edge of the sidewalks. This work was done by a private company known as the "Ornamental Tree Society". On the common about 100 trees have been set out by the city and some 17 by private persons. The construction of streets is generally done by the city, and the repa s are entirely done by it. The annual cost for both is $1,800. For grading or other large work, contract is preferred. For maintenance or repairs contract has never been tried. The city owns a steam stone-crusher, but this has not been used for three years. The Lynn and Boston horse-railroad passes through the city, the rates of fare being 4 cents inside the limits and 5 cents to Boston or Lynn. For further particulars of this road, see *Boston*. There are no omnibus lines in the city.

WATER-WORKS.

The water-works are owned by the city, and cost $300,000. The supply is taken from the Mystic department of the Boston water-works. The pressure in the pipes is 45 pounds to the square inch. The yearly cost of maintenance is $4,938. There are 28.3 miles of supply-mains connected with the works and 21 miles of service-pipe.


CHELSEA,
MASS.
MYSTIC RIVER
EAST BOSTON
CHELSEA RIVER
BREED'S ISLAND
MEAN HIGH TIDE
MEAN LOW TIDE


ISLAND END RIVER
MYSTIC RIVER
CHELSEA RIVER
CHELSEA, MASS.,
SEWER MAP.
Explanation:
Brick Sewers
Pipe "
Wood "
Outlets
SCALE,
0
600
1200

There are 137 hydrants and 227 gates. Water is supplied to the following places: 3,718 dwellings, 4,665 families, 289 stores and saloons, 69 manufactories, 73 offices, halls, and clubs, 12 churches, 378 stables, 61 public schools, and 54 miscellaneous establishments.

GAS.

Gas is supplied by a private corporation. The average daily production is 55,000 cubic feet. The charge is $3 per 1,000 cubic feet. The city pays $18 80 per annum for each gas street-lamp, 365 in number. There are in addition 127 gasoline street-lamps.

PUBLIC BUILDINGS.

The city owns and occupies, for municipal uses wholly or in part, 1 city hall, 1 engine-house, 1 hose-house, 1 hook-and-ladder house, 1 station-house, 1 stable, 1 almshouse, 1 pest-house, and 10 school-houses. The city leases rooms for the police headquarters and water-offices. The city hall cost $75,000, and is owned and used entirely by the city.

PUBLIC PARKS AND PLEASURE-GROUNDS.

Union Park, between Walnut and Cedar, Fifth and Sixth streets, has an area of about 4 acres. It is the only park in the city. Neither its original cost nor the yearly cost of maintenance is reported. There are no special ordinances regarding this park.

PLACES OF AMUSEMENT.

There is one theater in the city, the Academy of Music, with a seating capacity of 1,300, which is used for exhibitions, etc. Broadway hall, seating capacity, 900; Granite hall, seating capacity, 800; Hancock hall, seating capacity, 300; Fremont hall, seating capacity, 200; Liberty hall, seating capacity, 200; and Library hall, seating capacity, 200, are used for concerts, lectures, balls, etc. The theater pays an annual license to the city of $25, and the halls pay $5 each. There are no concert-saloons or beer-gardens in the city.

DRAINAGE.

The only natural water-courses within the limits of Chelsea were tidal streams or creeks. Some of these have been cut off by dikes furnished with tide-gates; others have been filled and the adjacent marshes graded up to a suitable level for streets and building-lots. Where streams have been filled in no provision has been made for subsoil drainage along their beds, but filling has been put in solid. Early drainage works consisted of private drains of primitive construction, built in short lengths, and together would not aggregate more than 2,000 feet. None of these have been incorporated into the public sewerage system.

The sewerage consists of numerous independent systems of draining to convenient outfalls, sometimes on the adjacent marshes, but principally to the large streams along the city front, connecting with the Mystic river. Each street leading to the river has a sewer with its outfall at the river, thus distributing the sewage along the whole water-front. Where streets do not extend to the water, sewers discharge on the meadows in open trenches several hundred feet back from the shore. These open mouths or trenches are extended from year to year as they become offensive, usually by building wooden extensions across the low ground. For example, in the year 1880, complaint was entered early in the season against the outlet of a sewer in Chester avenue. To remove the nuisance the wooden outlet was extended into the marsh 172 feet. The trench was thoroughly cleansed for about 200 feet farther, and no more complaint was made during the season. The outlet of this sewer is still 1,000 feet from the river-shore. It discharges the contents of about half a mile of pipe-sewers. Other sewers of considerably greater extent discharge at a greater distance from the river, or into small streams containing but little water.

Most sewers are built of brick, even when as small as 12 inches in diameter. Outfalls are sometimes made of wood. Pipes are used quite extensively for sewers, and are made usually of cement. Very little vitrified clay pipe has been laid.

The ventilation of sewers, until quite recently, has been almost entirely neglected, and many miles of old sewers are furnished with tight covers and trapped catch-basins, leaving no vent for compressed air and gases whenever the outlets become closed by the tide or by storm-water. Works built within the past few years are furnished with perforated covers, and these have been placed in some older works. In some instances traps have been removed from catch-basins as a temporary relief.

There is no regular system of flushing. Storm-water is admitted by catch-basins of the usual pattern. Deposits of solid matter sufficient to cause obstruction are rare. About 130 feet of brick sewer, built over twenty years ago, was cleansed by hand in 1880, at a cost of 13 cents per foot. About 1,000 feet of 3½-foot brick sewer, built six years ago, was cleansed by hand through the manholes, at a cost of 8½ cents per foot. These are the only sewers cleaned for years.

Hollow invert blocks have been used in only one sewer about 1,300 feet long. When the sewer was built great trouble was experienced with water. All the wells in the vicinity were drained, and had to be deepened before water was secured. It is not known how much of this drainage is due to the use of hollow invert blocks.

The cost of sewerage is borne one-fourth by the city and three-fourths by owners of adjacent property, except on poor marsh-land, where assessments are held as a fee, to be paid on entering private drains. Assessments are based on area of land within 100 feet of the street. The cost of sewers in 1880 is shown in the following table:

Description.	Length.	Average depth of cutting.	Cost per foot.
	Feet.	*Feet.*	
12-inch pipe.....	800	9.8	$1 13
10-inch pipe.....	100	9.5	1 10
12-inch pipe.....	458	8.9	1 00
12-inch pipe.....	222	7.8	1 00
12-inch pipe.....	139	12.0	1 40
15-inch pipe.....	1,025	8.5	1 32
3′ × 2½′ (plank)	172	3.0	1 25
2½′ × 2′ (plank)	1,200	6.0	1 08

Average cost of house branches, $1 10 each; average cost of catch-basins side of street, $70 each; average cost of catch-basins corner of street, $84 each. Average cost of manholes, $40 each; curb and cover, $13 10; whole cost, $53 10.

The most important work in connection with the sewerage of Chelsea, besides the ordinary extension of laterals, is the extension and outfall of the large sewer in Spruce street, across the United States hospital grounds, 1,275 feet to the river. This provides for the drainage of about 1,300 houses through 9 miles of sewers, and will doubtless be considerably extended. The cost of the work, including tide-gate chamber and gates, seven manholes, and one collecting-chamber, was about $23,000. In his description of this work, the city engineer says:

> If the old Spruce Street sewer could have been extended to tide-water without any precautions to prevent the inflow of the tide, the cost would have been much less; but with an unprotected outlet the cellars of about 300 houses would have been flooded with every tide. To prevent this a "tide-gate chamber" was constructed. This consists of a large chamber divided into two compartments and provided with two sets of gates, one set to act in case of accident to the other. These gates are closed by the incoming tide, and act as a dam to keep out the water. During the time the gates are closed the sewage is provided for by having two sewers of the same size and section side by side with a common center-wall. These are 5 feet high and 6 feet wide, and are formed by an arch of 3 feet radius resting on an invert having a radius of 5 feet. One branch forms a direct outlet, the other acts as a reservoir after the water in the first has risen 3 feet, when the two act together as one reservoir.

All cement used in this work had to be capable of sustaining 50 pounds to the square inch after being in air twenty minutes and in water twenty-four hours. There were 2,375 barrels tested for this purpose, and three lots—about 200 barrels—were condemned.

The accompanying diagram illustrates this work.

CEMETERY.

There is one cemetery in the city—*Garden Cemetery*—situated in the third ward, between Shawmut, Lynn, and Chelsea streets and Central avenue. It is owned by a private corporation that makes its own rules, etc. The average number of interments annually is 175. Burial permits are issued by the city clerk. Most of the burials from the city are made in Woodlawn cemetery, Everett, and in the Catholic cemeteries in Boston and Malden, and are governed by the ordinances in force there.

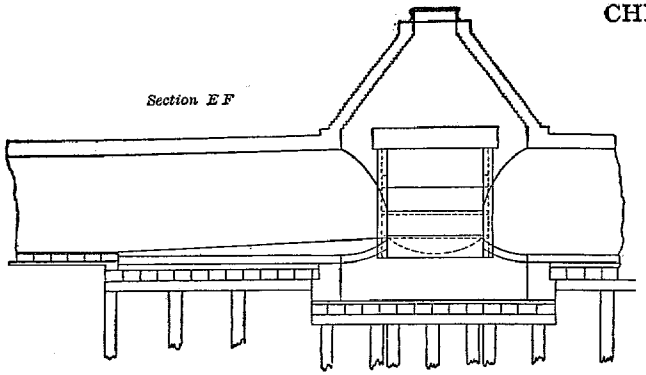
MARKETS.

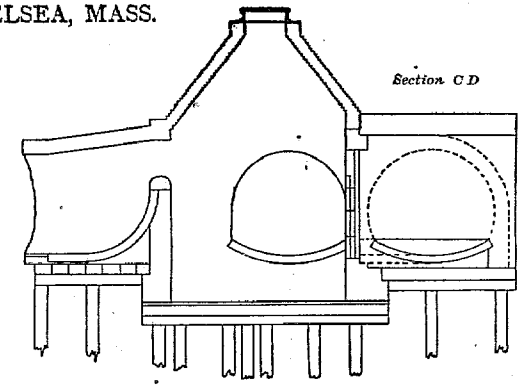
There are no public or corporation markets in Chelsea.

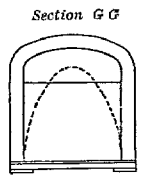
SANITARY AUTHORITY—BOARD OF HEALTH.

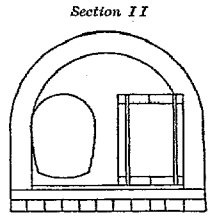
The chief sanitary authority of Chelsea is vested in the board of health, composed of two citizens—not members of the city government—appointed annually by the mayor, and subject to the approval of the board of aldermen—and the city physician, a member *ex-officio*. The board was first appointed January 22 of this year, and organized February 2 following. The members serve without salary, although the city physician receives $600 a year, but not as a member. The board is independent, subject to the city council only so far as appropriations are concerned, and can exercise the same powers in sanitary matters as the city council or mayor and aldermen formerly held under the statutes. It can employ such assistants as are necessary, and fix their compensation at such amounts as it thinks best, provided the same does not exceed the annual appropriation. The first annual appropriation was $5,000, and of this the board expended $3,575 47 in the eleven months of the year, principally for

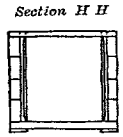
CHELSEA, MASS.

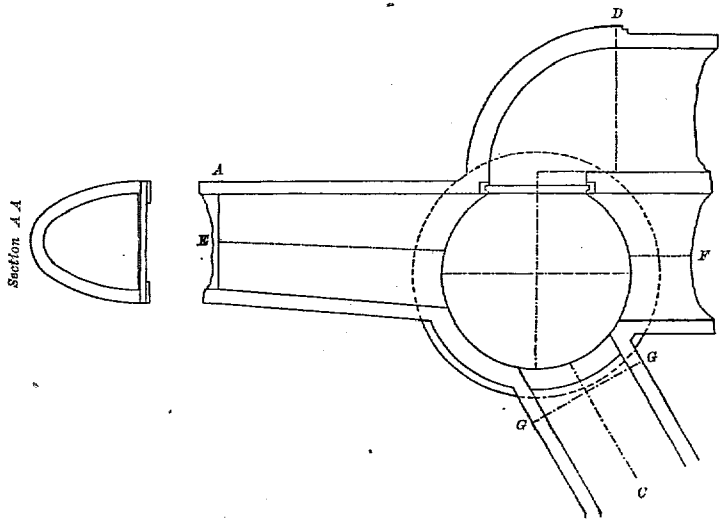


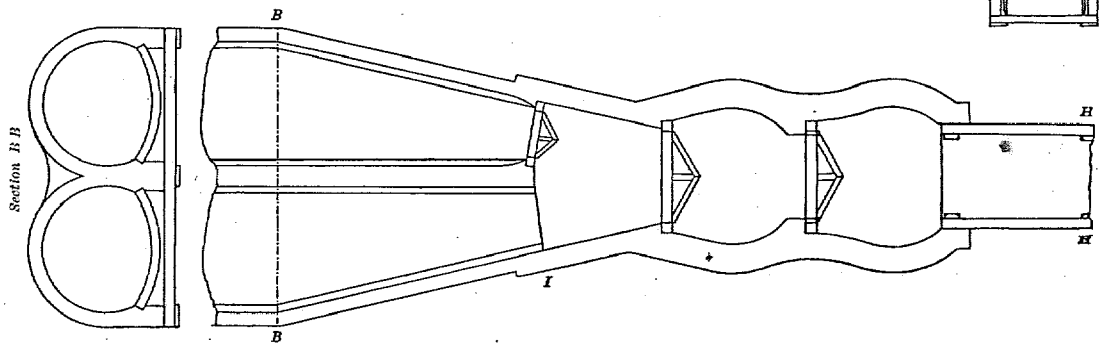












the collecting of ashes and garbage, and for printing, stationery, etc. So far the board has had no experience in case of an epidemic. In absence of an epidemic the board has under its supervision and control the abatement of nuisances, the regulation of offensive walks, the granting of licenses to collect grease and to keep swine and goats, the removal of dead animals, etc. The chairman is chief executive officer, and presides at all meetings. No assistant inspectors have as yet been appointed. Nuisances are inspected as reported, and if found to exist are ordered abated, and the order is enforced. The inspection and correction of defective house-drainage, privy-vaults, cesspools, and sources of drinking-water are under control of the board, and when these become nuisances they are treated as such. Strict attention has been paid to the subject of defective house-drainage. The city engineer has charge of the sewers and street-cleaning. The board, on complaints, has inspected the sewers, and conferred with the city engineer as to the best manner of rectifying imperfections in them. The board exercises full control over the keeping and removal of all garbage. The present system is reported as objectionable and will soon be changed. The board makes no regulations regarding the burial of the dead, that being regulated by the state law.

INFECTIOUS DISEASES.

Small-pox patients are either quarantined at home or removed to the pest-house, which is situated in an isolated part of the city. Scarlet fever has never been an epidemic in Chelsea, and no regulations have been made for quarantining patients. No child from any family in which a case of diphtheria or scarlet fever has occurred can attend the public schools, unless by special permission of the board, until four weeks after the beginning of the last case in such family. Vaccination is compulsory and is done at the public expense. Physicians are obliged to report to the board any case of a contagious nature which they are called to attend. Householders also are required to make a similar report.

REPORTS.

The board of health reports annually to the city council, and this report is published with the regular city documents. It must contain a full statement of the acts of the board during the year, and of the sanitary condition of the city.

MUNICIPAL CLEANSING.

Street-cleaning.—The streets are cleaned at the expense of the city and with its own regular force. On the paved streets sweeping-machines are used, but on the other streets the work is done by hand. The main thoroughfares are cleaned every two or three weeks, and the others as they seem to need it. The work is reported as done reasonably well. No separate account of the expense is kept. The sweepings are used for filling in marsh-lands.

Removal of garbage and ashes.—These are removed by a contractor who is paid by the city. The contract provides that between April and November the garbage shall be removed every day from all hotels, boarding-houses, restaurants, fish-markets, and provision-stores, and from all other houses every two days. From November to April collections are made at least twice in each week. Ashes and rubbish must be separate from the garbage while awaiting removal. The garbage is taken outside the city and sold to farmers in the adjacent towns. The annual cost to the city (1880) is $791 96. Ashes and rubbish are removed by the contractors at least twice each week, and taken to the marsh-lands and used for filling. Ashes are removed promptly, but the city finds it difficult to keep the contractor for the removal of garbage up to his duty. The total cost for the removal of ashes during eleven months of last year was $2,714 17.

Dead animals.—The carcasses of the larger animals dying in the city are removed by private parties to rendering-establishments without cost to the city. The carcasses of the smaller animals—cats, dogs, etc.—are thrown into the ash-bins and removed by the contractor in his regular rounds. No record of the number so removed has been kept. The system is reported to work well, and no complaints have been made.

Liquid household wastes.—Most of the liquid household wastes go into the public sewers, and none is allowed to go into the street-gutters. Where sewers do not extend the wastes are thrown into cesspools and privy-vaults. The cesspools are generally porous, are not provided with overflows, and in some instances receive the wastes from water-closets. No special ordinances seem to regulate the cleaning of cesspools, unless they are classed as privy-vaults, and as the gutters receive no wastes they are not flushed.

Human excreta.—About 50 per cent. of the houses are provided with water-closets, nearly all delivering into the sewers; the rest depend on privy-vaults, which must be water-tight and at least 2 feet from any party line. The contents must never reach within 2 feet of the surface of the ground. Privy-vaults are controlled directly by the board of health, and are emptied by contractors at a fixed rate. The night-soil is removed beyond the city limits and used by farmers in the adjacent towns as manure, none of it being allowed on the gathering-grounds of the public water-supply.

Manufacturing wastes.—There is no manufacturing in the city of such a nature as to require regulations concerning the disposal of its wastes.

POLICE.

The police force is appointed annually by the mayor, subject to the approval of the board of aldermen, and is governed by the mayor and aldermen, organized as a committee on police. The chief executive officer is the city marshal, who has command of the force and is responsible for its efficiency. He is required to give bonds of $1,000, with sureties in a like sum, for the proper performance of his duties, and receives a salary of $1,500 a year. The rest of the force consists of 2 assistant marshals, at $2 75 a day each, and 17 patrolmen, at $2 50 a day each. The uniform is a blue single-breasted frock coat, an overcoat of blue cloth, double-breasted, and in summer a single-breasted blue-flannel blouse. The men provide their own uniforms. They are equipped with a Colt's Derringer pistol, a belt, and a club, each. For parades a long club is carried. The patrolmen are divided into two watches—day, 10 hours, and night, 9 hours. All the streets in the city are patrolled by the force. During the past year the police made 693 arrests, the principal causes being for assault, drunkenness, larceny, violations of the liquor-law, burglary, and threatening violence. These cases were generally disposed of by fines and imprisonment. The total amount of property lost or stolen and reported to the police was $2,914 89, of which $1,264 74 was recovered and returned to the owners. The total number of station-house lodgers was 792, against 1,394 in 1879. Free meals are not provided for these lodgers, but biscuits and coffee, to the value of $40 annually, are given them. In addition to the above, the force during the same time suppressed 331 disturbances, restored 124 lost children, secured 114 buildings found open, and helped home 110 intoxicated persons, and extinguished 17 fires without an alarm. The force is required to co-operate with the fire, health, and building departments. Special policemen for churches, factories, depots, etc., are appointed by the mayor and aldermen. They have the same powers as regular policemen, and are under control of the city marshal, but receive no pay from the city. The annual expense of the department (1880) is $19,250 17.

FIRE DEPARTMENT.

The fire department consists of 1 chief and 3 assistant engineers, and 58 officers and men, divided as follows: Two steamer companies—one of 13 and one of 14 men—one hook-and-ladder company of 20 men, and 1 horse hose company of 11 men. This includes a driver and fireman for each steamer, and a driver for each hose-carriage and the hook-and-ladder truck, employed permanently. These companies have charge of 2 steam fire-engines, 3 horse hose-carriages, and 1 hook-and-ladder truck. The department also owns 1 four-wheeled hose-carriage, 3 two-wheeled hose-carriages—1 of which, with 500 feet of hose and the necessary apparatus, is located at Prattville—3 fuel-wagons, and 3 sleighs. There are 7,250 feet of hose in the department—3,500 feet of first-class cotton hose and 3,750 feet of rubber hose. Of the latter, 1,900 feet is in good and 1,850 in poor condition. The fire-alarm telegraph is in good order, and has, except in rare instances, given satisfaction during the year. During the past year the whole amount of property destroyed by fire was $13,815, and on this insurance to the amount of $9,405 was paid. The chief engineer and the three assistant engineers are appointed annually by the mayor and aldermen. They form the board of engineers, the chief being chairman and one of the members being selected as clerk. They recommend such persons as they deem proper for members of the department, make all rules and regulations for its government, and are held responsible for its good order and efficiency.

MANUFACTURES.

The following is a summary of the statistics of the manufactures of Chelsea for 1880, being taken from the tables prepared for the Tenth Census by John Sale, special agent:

Mechanical and manufacturing industries.	No. of establishments.	Capital.	Average number of hands employed.			Total amount paid in wages during the year.	Value of materials.	Value of products.
			Males above 16 years.	Females above 15 years.	Children and youths.			
All industries	155	$1,822,250	1,122	500	25	$677,787	$2,691,911	$3,846,250
Blacksmithing	8	9,950	13	.....	.....	6,599	9,251	18,988
Boots and shoes, including custom work and repairing	4	6,200	10	1	2	4,470	5,600	13,400
Bread and other bakery products	9	96,600	44	11	2	21,449	153,675	226,312
Brick and tile	3	31,000	47	.....	4	14,750	25,000	42,250
Carpentering	15	17,850	27	.....	1	13,799	31,547	55,110
Carriages and wagons	3	12,000	9	.....	.....	6,320	3,490	13,900
Clothing, men's	4	3,700	6	9	.....	3,950	7,000	16,300
Confectionery	3	5,500	6	6	.....	1,400	11,200	18,800
Cotton goods	3	405,000	69	303	.....	89,350	373,703	511,340
Foundery and machine-shop products	4	516,000	284	.....	.....	178,837	190,000	464,000

Mechanical and manufacturing industries.	No. of establishments.	Capital.	AVERAGE NUMBER OF HANDS EMPLOYED.			Total amount paid in wages during the year.	Value of materials.	Value of products.
			Males above 16 years.	Females above 15 years.	Children and youths.			
Furniture	4	$38,200	32	4	.....	$15,138	$35,676	$64,814
Leather, curried	5	53,300	79	.....	1	37,140	717,601	793,263
Marble and stone work	3	3,800	10	.....	.....	5,600	3,650	13,650
Masonry, brick and stone	4	8,200	30	.....	1	7,070	15,500	25,166
Painting and paperhanging	11	8,350	30	.....	.....	12,197	9,590	31,501
Plumbing and gasfitting	6	9,150	20	.....	.....	6,611	13,150	24,340
Roofing and roofing materials	3	13,000	18	.....	.....	10,700	54,500	72,000
Saddlery and harness	3	4,300	6	.....	.....	3,350	3,300	9,900
Soap and candles	4	12,800	9	.....	.....	4,912	14,060	22,750
Tobacco, cigars, and cigarettes	12	34,950	36	48	2	25,598	74,640	110,284
All other industries (*a*)	44	532,400	337	118	12	207,897	930,772	1,298,173

a Embracing baking and yeast powders; bluing; bone-, ivory-, and lamp-black; bookbinding and blank-book making; boxes, fancy and paper; brass castings; brooms and brushes; cars, railroad, street, and repairs; cleansing and polishing preparations; drugs and chemicals; dyeing and cleaning; fertilizers; flavoring extracts; furniture, chairs; hairwork; hardware; hosiery and knit goods; leather, tanned; looking-glass and picture frames; mattresses and spring beds; oil, lubricating; oil, neat's-foot; paperhangings; photographing; printing and publishing; rubber and elastic goods; shipbuilding; stone- and earthen-ware; tinware copperware, and sheet-iron ware; tools; type founding; upholstering; varnish; watch and clock repairing; wheelwrighting; and window blinds and shades.

From the foregoing table it appears that the average capital of all establishments is $11,756 45; that the average wages of all hands employed is $411 50 per annum; that the average outlay in wages, in materials, and in interest (at 6 per cent.) on capital employed is $22,445 05.

CHICOPEE,

HAMPDEN COUNTY, MASSACHUSETTS.

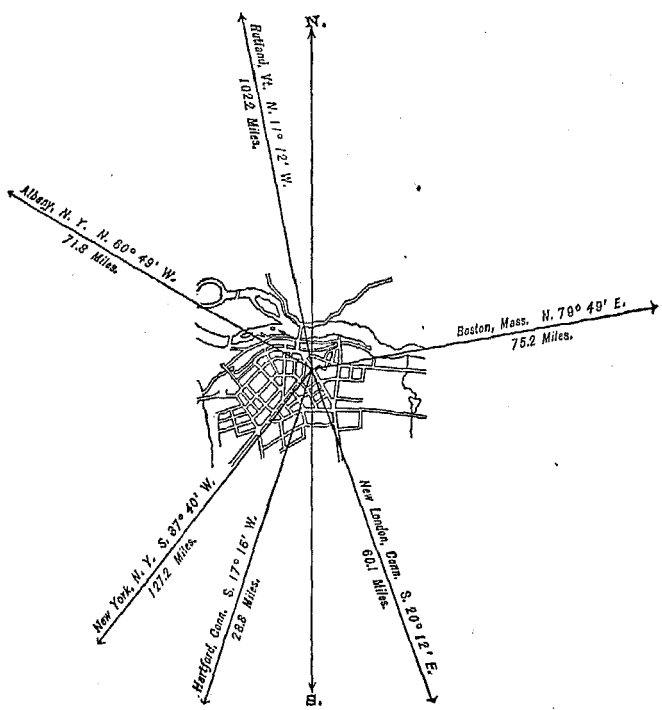
POPULATION

IN THE

AGGREGATE,

1850-1880.

	Inhab.
1790	.....
1800	.....
1810	.....
1820	.....
1830	.....
1840	.....
1850	8,291
1860	7,261
1870	9,607
1880	11,286



POPULATION

BY

SEX, NATIVITY, AND RACE,

AT

CENSUS OF 1880.

Male	5,236
Female	6,050
Native	6,780
Foreign-born	4,506
White	11,285
Colored	1

Latitude: 42° 10′ North; Longitude: 72° 31′ (west from Greenwich); **Altitude: 30 to 130 feet.**

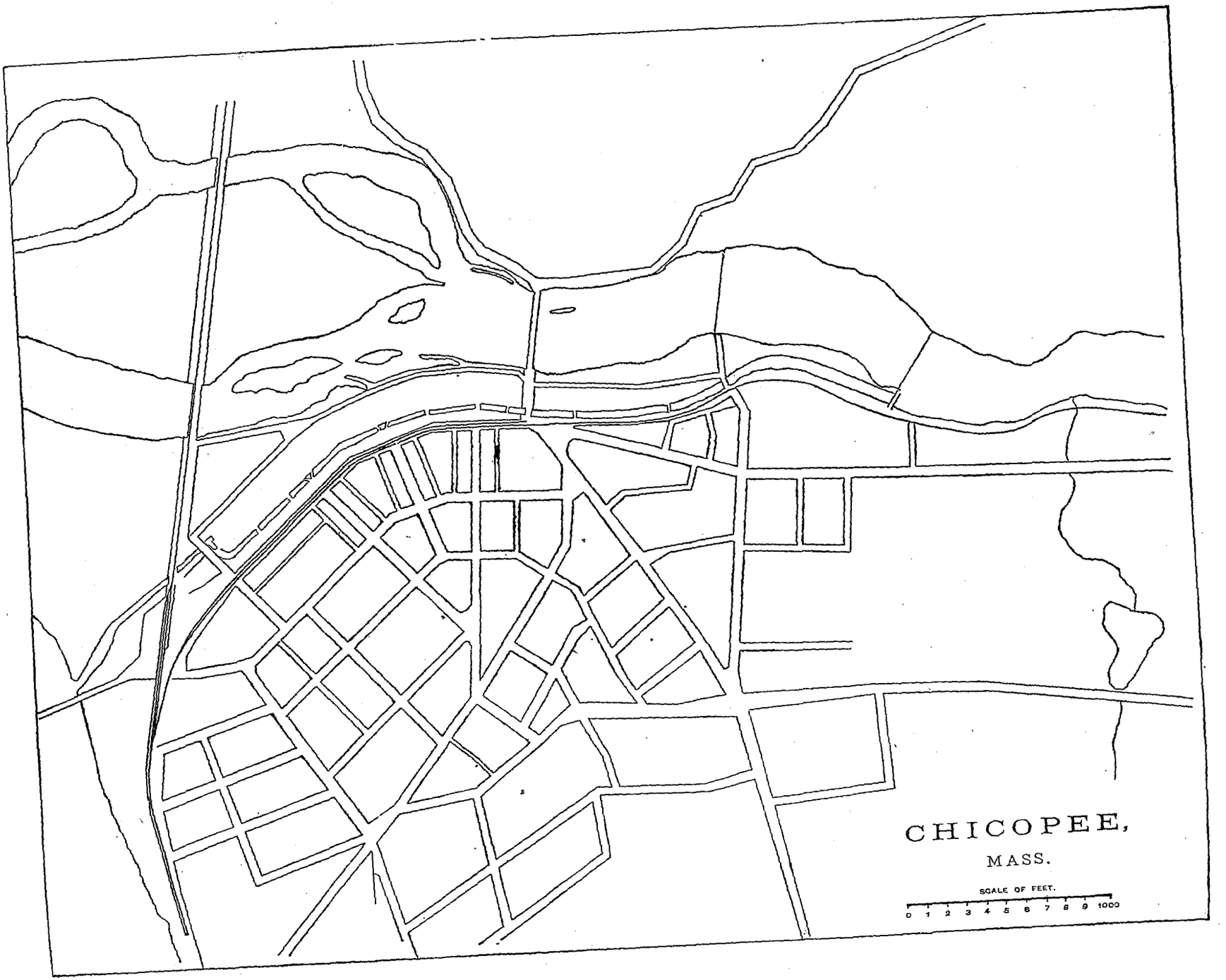
FINANCIAL CONDITION:

Total Valuation: $4,980,605; per capita: $441 00. Net Indebtedness: $100,050; per capita: $8 86. Tax per $100: $1 45.

HISTORICAL SKETCH.

Chicopee grew into a separate town from the northward extension of Springfield. The first settlement of its territory occurred very early on what is known as Chicopee Street, probably within four years from the date of the first settlement at Springfield in 1636. The first settlers of Chicopee were Japhet and Henry Chapin. Their offspring were numerous, and for a long time almost the entire population of the place were connected with them.

A settlement at "Skipmuck", a locality about a mile east of Chicopee Falls, began about the beginning of 1660, mostly on the south side of the river. The scattered settlers fled to Springfield when menaced by Indians, and for nearly a century their business and church connections were entirely in the mother town. In 1750, when the first parish in Springfield was about to build a new church edifice, the people in the north part of the town, on both sides of the river, moved for and secured incorporation as the fifth, or Chicopee, parish of Springfield.


CHICOPEE,
MASS.
SCALE OF FEET.
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The first manufactory was started by James Byers and William Smith, of Springfield, who, on May 7, 1786, were given a perpetual lease of 2 acres of land and the water-privileges on the south side of Chicopee river at *Skenungonuck* (Chicopee) falls, by certain owners of the same. The conditions were that within two years a furnace or iron-works of some kind should be erected. They complied by building a blast-furnace for the manufacture of iron hollow-ware. The business was not very extensively developed until the property passed, in June, 1801, into the hands of Benjamin Belcher, Abijah Witherell, and William Witherell. In 1805 Mr. Belcher purchased the right to the whole property, and continued the business until 1822, when he disposed of the water-privileges and the land on which the village of Chicopee Falls now stands.

Oliver Chapin was the first settler on the north side of Chicopee river at this point. He came with his family in April, 1801. In 1806 he sold the privilege on that side of the river to William Bowman, Benjamin Cox, and Lawrence Cox, who erected a paper-mill. Various manufacturing enterprises were successively established for the making of cutlery, farming implements, ordnance, etc.

The town of Springfield rapidly advanced in wealth, size, and importance, and in 1847 there were 2,460 votes polled at the November election. It became very inconvenient for all the inhabitants to meet in one body to transact their town business. In 1844 the people of the village of Cabotville petitioned the legislature to be set off from Springfield and incorporated into a new town. The measure was strongly opposed by other parts of the town, and this was not done. After various plans had been discussed the legislature at last, by a large vote, April 25, 1848, set off from the town of Springfield the territory embraced in the villages of Cabotville, Chicopee Falls, Chicopee Street, and Williamsett, and passed an act incorporating the same as the new town of Chicopee, which received the signature of the governor April 29, 1848. An unsuccessful effort was subsequently made to have the territory lying east of it, to the Ludlow and Wilbraham line, annexed to the new town of Chicopee. The municipal government of the new town was organized May 17, 1848.

At the time of division Springfield contained 19,189 inhabitants. Chicopee at the date of its incorporation had within its limits real and personal estate to the amount of $3,301,613, and the population was estimated at 7,861.

CHICOPEE IN 1880.

The following statistical accounts, collected by Census Office, indicate the present condition of Chicopee:

LOCATION.

Chicopee lies in latitude 42° 10′ north, longitude 72° 31′ west from Greenwich, on the east bank of the Connecticut river, 6 miles above Springfield. The average elevation above sea-level is 60 feet, rising from the river, 30 feet, to the pine plains, 130 feet above sea-level. The Connecticut river is not navigable here, though during the past year coal to some extent has been brought to Chicopee in flat-boats.

RAILROAD COMMUNICATIONS.

The town is on the Connecticut Valley railroad, having direct communication with Montreal on the north, and, through Springfield, with connecting roads south, east, and west.

TRIBUTARY COUNTRY.

Aside from the manufacturing interests the country immediately tributary to Chicopee is occupied by an agricultural community, there being over 100 farms in the township alone. The bottom-land of the Connecticut river is very productive and large crops are raised. The city of Springfield on the south, only 6 miles distant, affords a ready market.

TOPOGRAPHY.

The western part of the town lies along the valley of the Connecticut river. The bottom-land and that immediately adjoining it is of the highest and best natural quality for agricultural purposes. The remainder of the town is more mixed and broken, the easterly part being divided by the Chicopee river, which furnishes the motive-power for the various manufactories, while a large portion of the remaining territory may be classed as "pine plains", with here and there spots of more or less fertility, much of it valueless for farming-purposes. This pine plain, as contrasted with the bottom-lands of the valley, is a general level, averaging 80 feet above the meadows, while the latter average about 25 feet above low-water mark of the river. The drainage is toward the Chicopee and Connecticut rivers, the latter receiving the larger portion.

CLIMATE.

The highest recorded summer temperature is 105°; highest summer temperature in average years, 96° to 98°. Lowest recorded winter temperature, —23°; lowest winter temperature in average years, —3° to —5°. These are from observations taken at various locations in the town. The influence of adjacent waters, marshes, elevated lands, and prevailing winds on the climate is not noticeable.

STREETS.

The total length of streets is not stated. None of the streets or roads in the town are paved, all being of dirt, hardened here and there on the principal ones with gravel. The total number of miles finished in this way is not stated. Thus far it is only an experiment, and no record is kept. The cost is 33 to 50 cents per square yard, which is the actual cost of the gravel hauled to the spot. Owing to the scarcity of gravel-beds in the town, the cartage is of necessity from a distance. The sidewalks are constructed of brick and concrete. The number of miles is not given, but so far $10,000 has been expended in laying both kinds of walks, and there is now an annual increase at the rate of $2,000. Gutters are laid in brick, cobble-stones, and concrete, the latter being preferred. Trees are planted between the sidewalk and the carriage-way by the abutters. The construction and repairs of streets and highways are done by the highway surveyor. The town is divided into three districts, in each of which a surveyor is appointed, the labor and expense being under his direction, subject to the control of the selectmen. The annual report of the selectmen for the past year shows a total expenditure for streets and highways of $12,236 48. Both contract and day work here have been tried, and the opinions as to their respective merits are divided. There are no street-railroads or omnibus lines in the town.

WATER-WORKS.

The water-works are owned by a private corporation, and their first cost was $55,000. The supply is taken from brooks and springs, and distributed through 6 miles of pipe by gravity. The average annual cost of maintenance and repairs is given as $400.

GAS.

Gas is furnished by a private corporation at the rate of $3 50 per 1,000 cubic feet. Neither the average daily production, number of street-lamps, nor their cost per annum could be ascertained.

PUBLIC BUILDINGS.

The town owns and occupies for municipal purposes wholly or in part 1 town-hall building and 10 school-houses, the total cost being $170,000. The town hall cost $100,000, is owned entirely by the town, and is occupied by the offices of the clerk, treasurer, selectmen, assessors, superintendent of schools, the public library, free reading-room, the police quarters, and the police court-room.

PUBLIC PARKS AND PLEASURE-GROUNDS.

The common, situated between Park, School, Spencer, and Chestnut streets, area about 2 acres, is the only ground that is open to the public in the town. It belongs to the owners of the adjacent property. There is also a small park (private) at the intersection of Cabot with Center streets, area not given.

PLACES OF AMUSEMENT.

There are no theaters in Chicopee. The town hall, with a seating capacity of 1,200, is specially designed for public use, and on account of its size is used for concerts, lectures, festivals, balls, etc. There are two private halls, seating capacity not given, fitted with stage scenery, etc., that are used for all kinds of exhibitions. There is also Wilde's hall, seating capacity 300; Cabot hall, at Chicopee Center, seating capacity 500; and Temperance hall, at Chicopee Falls, seating capacity 400. None of these halls pay any license, but all exhibitions are taxed, generally $2 for each night.

DRAINAGE.

No information on this subject was furnished.

CEMETERIES.

Chicopee has seven cemeteries; one in the northwest part of the town is old, but still used. The same may be said of that at Chicopee Falls. There is one at Chicopee Center. There are three Catholic cemeteries, and one recently established, a little out of the Center. Their size, names, and locations were not stated. Interments are still made in all. The oldest cemetery has been in use for eighty or a hundred years; two for over fifty years; the Catholic cemeteries for thirty, fifteen, and eight years, respectively; and the New cemetery, for ten years. Burial

permits, issued by the town clerk, are required for all interments. The board of health controls the limit of time after death for interments and the depth of the graves. Since the incorporation of the town in 1848, 6,987 interments have been recorded.

MARKETS.

There are no public or corporation markets in the town.

SANITARY AUTHORITY.—BOARD OF HEALTH.

The chief sanitary authority of Chicopee is the board of health, composed of the selectmen, who receive no extra pay for this duty. In the absence of an epidemic the board incurs no expense, but during the prevalence of an epidemic it can, as selectmen, appropriate such amount as may be deemed necessary. In ordinary times the board exercises general sanitary care of the town, has authority to enact regulations for the preservation of health, and can suppress all nuisances. The chairman of the selectmen is the presiding officer of the board, but all the members have equal authority. No health officers, inspectors, etc., are employed. The town physician acts as adviser, and the police are under orders of the board. The board forbids the casting of filth of any kind into the street, or the keeping of swine in the thickly-settled part of the town. It requires that all tenements shall have sufficient drainage and be supplied with privies. Where tenements are too thickly crowded the board can order the inhabitants to vacate. No business giving rise to offensive or noxious vapors can be carried on in the town. No regular inspections are made, but the board requests the people to report all the nuisances they may discover. When a nuisance is found to exist the board orders its removal within a reasonable time. If this order is disregarded, the removal is made by the board and the expense is charged to the estate on which the nuisance existed. The board corrects defective house-drainage, privy-vaults, cesspools, etc., only when they are reported as nuisances. Defective sewerage and street-cleaning are also under the control of the board. No control is exercised over the conservation and removal of garbage other than to see that it does not become a nuisance. The regulations forbid the casting of any dead or decaying animal or vegetable substances into any canal or waters of the town. Burial permits are required, with certificates from the town clerk, or, in his absence, from the chairman of the board of health.

INFECTIOUS DISEASES.

No cases of small-pox have occurred in the town for years, and there are no regulations regarding its treatment. There is a pest-house situated on the town farm, apart from the almshouse. No rules regulate the treatment of scarlet fever. The board has ample power should contagious diseases break out in the public schools. Vaccination is compulsory under state laws, and is done at public expense only when persons are unable to pay.

The registration of diseases, births, and deaths is made under the state laws by the town clerk.

REPORTS.

The board makes an annual report to the town, and this is published with the regular reports of the town officers.

MUNICIPAL CLEANSING.

Street-cleaning.—The streets are cleaned as circumstances require, but how or by whom was not reported.

Removal of garbage and ashes.—All garbage and ashes are removed by the householders in such ways as they see fit. The rules of the board of health simply require that garbage shall not become a nuisance or be thrown on the streets. No nuisance arising from the workings of this system is reported, and it seems to meet the needs of the community.

Dead animals.—The carcass of any animal dying within the town must be buried by the owner. No place is designated for the purpose, but the carcass must not be left on any street or cast into any of the waters within the town. Neither the number of dead animals removed nor the cost of this service annually was stated.

Liquid household wastes are either run into the sewers or thrown into vaults and cesspools, none being allowed to pass into the gutters. Cesspools are used to some extent, and are not provided with overflows. There are no special rules regarding their construction or cleaning. The street gutters are not flushed. Every house must have a good underground drain for the disposal of wastes, but how well this rule is obeyed is not stated.

Human excreta.—The number of houses having water-closets is small. They deliver into sewers and vaults. The larger proportion of the houses depend on privy-vaults, which must be under-ground and of sufficient size. They are cleaned by persons licensed for the purpose by the board of health, and at such times as are designated. The night-soil is taken to neighboring farms, generally in winter, and used as manure, none of it, however, on the gathering-ground of the public water-supply.

Manufacturing wastes generally pass into the river, and so far no evil effects have been reported.

POLICE.

The police force of Chicopee is appointed and governed by the board of selectmen. The chief of police is the executive officer, and has entire charge of the force. He determines the hours of service, arranges the beats, and sees that all rules and regulations are enforced. His salary is $1,000 per annum, and he is obliged to give bonds in a like sum for the faithful performance of his duty. There are 5 policemen, who receive $700 a year each. The uniform is a blue frock coat, vest, and trousers, with gilt regulation buttons and a black hat. In winter an overcoat is worn and in summer a blouse. The men provide their own uniforms, at a cost of $35 each, and must always wear them when on duty. Each man is equipped with a club, nippers, and a pair of hand-cuffs. A silver badge is worn outside the outer coat. The men are on duty twelve hours at a time, except when the chief of police requires more, and one policeman must be on duty on each beat at all hours of the day and night. During 1880 there were 272 arrests, the principal causes being drunkenness, larceny, assault, and disturbing the peace. There were 220 station-house lodgers during the year, against 453 in 1879. Free meals are given to the lodgers, but at a small cost. The police force must co-operate with the fire department and with the board of health. Special policemen are appointed by the selectmen when it is judged necessary. They have the same powers as regular policemen, and receive $2 a day each while on duty. Local special policemen are appointed by the selectmen for duty at railroad stations, churches, manufacturing establishments, etc., but they receive no pay from the town. The yearly expense of the department (1880) is $4,500.

PUBLIC SCHOOLS.

There are 10 school-houses in the town, occupied by 18 schools, as follows: 2 high, 2 grammar, 4 intermediate, 8 primary, and 2 ungraded. The number of teachers is 35, including 1 special instructor in writing and drawing. The following table shows the number, attendance, etc., of the pupils in the various grades during the past year:

Schools.	Whole number registered during the year.	Average number.	Average attendance.	Per cent. of attendance.	Per cent. of absence.	Average number of tardiness to each pupil.
All schools	1,057	1,009.6	922.9	91.4	8.6	3.4
Center high	56	39.8	38.2	96.0	4.0	7.6
Falls high	43	24.5	23.6	96.3	3.7	3.7
Center grammar	101	73.8	71.1	96.2	3.8	1.7
Falls grammar	86	45.6	41.6	91.2	8.8	4.0
Intermediate	270	168.1	152.2	90.5	9.5	4.2
Primary	1,052	627.8	569.0	90.6	9.4	2.9
Ungraded	49	30.0	27.2	90.7	9.3	6.4

The total number of children between the ages of 5 and 15 in the town was 2,186. The public schools were attended by 1,657, while 1,030 are reported as attending the parochial and other schools, though some of these attended the public schools for a time and are enrolled there. A parochial school, started in September of this year (1880), drew a large number from the public schools. The total school expenses for the past year were $29,500 75.

FALL RIVER,

BRISTOL COUNTY, MASSACHUSETTS.

POPULATION

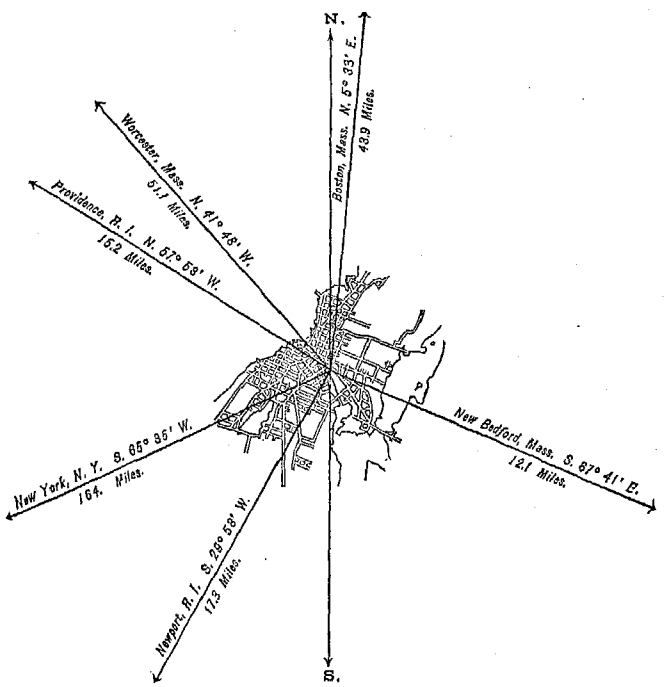
IN THE

AGGREGATE,

1800-1880.

	Inhab.
1790	-----
1800	*2,535
1810	1,296
1820	1,594
1830	4,158
1840	6,738
1850	11,524
1860	14,026
1870	26,766
1880	48,961

*Set off from Freetown in 1803.



POPULATION

BY

SEX, NATIVITY, AND RACE,

AT

CENSUS OF 1880.

Male	23,163
Female	25,798
Native	25,386
Foreign-born	23,575
White	48,801
Colored	*160

*Including 16 Indians.

Latitude: 41° 43′ North; Longitude: 71° 9′ (west from Greenwich); **Altitude: 0 to 275 feet.**

FINANCIAL CONDITION:

Total Valuation: $37,000,790; per capita: $756 00. Net Indebtedness: $3,160,765; per capita: $64 56. Tax per $100: $1 80.

HISTORICAL SKETCH.

Fall River, incorporated as a town in 1803 and granted a city charter in 1854, derives its name from a small stream (called by the Indians "Quequecham" and meaning *falling waters*) that is the outlet of a succession of long, narrow, and deep lakes lying in an elevated plateau a few miles from the shore-line, and flowing in its course to Mount Hope bay over a hard granite formation; "Watuppa", or *place for boats*, remains as the name of the lake. It and the region adjacent were first settled by the expansion of the Plymouth colony about the year 1656, when the general court granted to a number of freemen within its jurisdiction a tract of land east of Taunton river, 4 miles in width and 6 or 7 in length, and bounded by Quequecham on the south and Assonet Neck on the north. Three years subsequently this grant was confirmed by the sachems, the consideration being 20 coats, 2 rugs, 2 iron pots, 2 kettles and 1 little kettle, 8 pairs of shoes, 6 pairs of stockings, 12 hoes, 12 hatchets, 2 yards of broadcloth,

and the satisfaction of a debt which was due from Wamsitta to one John Barnes. This grant was first known as the "Freeman's purchase", and in 1683 was incorporated as *Freetown*. The first settlers were principally from Plymouth, Marshfield, and Scituate, some from Taunton and some from Rhode Island. The purchase was divided into shares and the shares set off to the several purchasers.

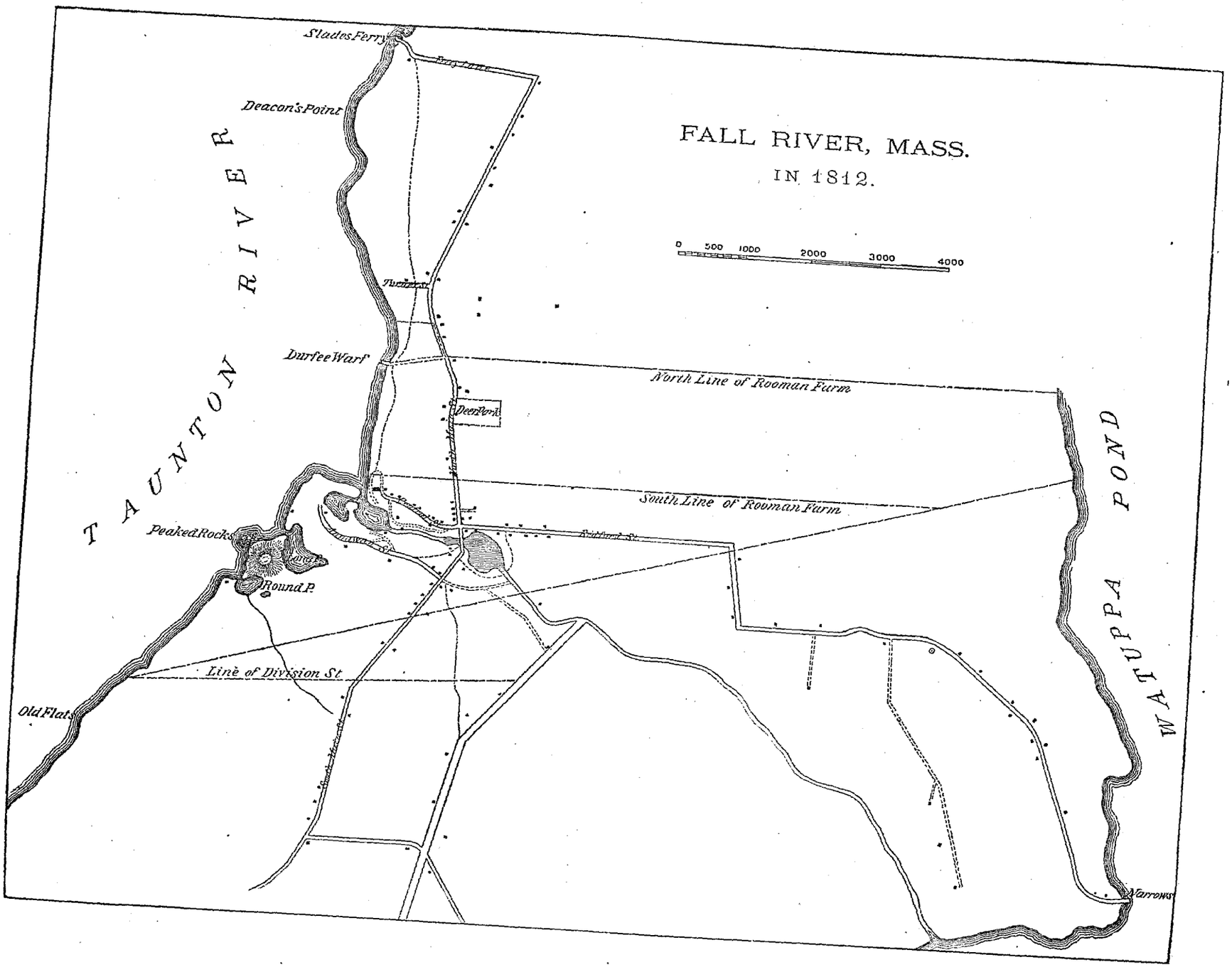
The occupation of the region north of Quequecham by settlers attracted attention to this locality, and a second grant was made by the governor, treasurer, and assistant, in 1680, to 8 persons of a tract of land southward along the bay to the towns of Dartmouth and Seaconnet, and inland from 4 to 6 miles. This grant of territory was also bought from the Indian sachems, the price being $1,100, and was termed "Pocasset purchase", the township name after incorporation being Tiverton. This purchase, like the preceding one, was divided into 30 shares (after reserving 30 rods wide adjacent to the "Freeman's purchase", the river, and some other smaller tracts) and distributed among the proprietors. The piece of land, including the water-power on the south side of the river to the present Main street, and on both sides east of said street to Watuppa pond, containing 66 acres, was also divided into 30 shares and sold to the original purchasers. The whole 66 acres was valued, in 1691, at about $740, and the piece on the north side at about $31 34, making the value of the whole water-power, and of most of the land where the city now stands, $771 34.

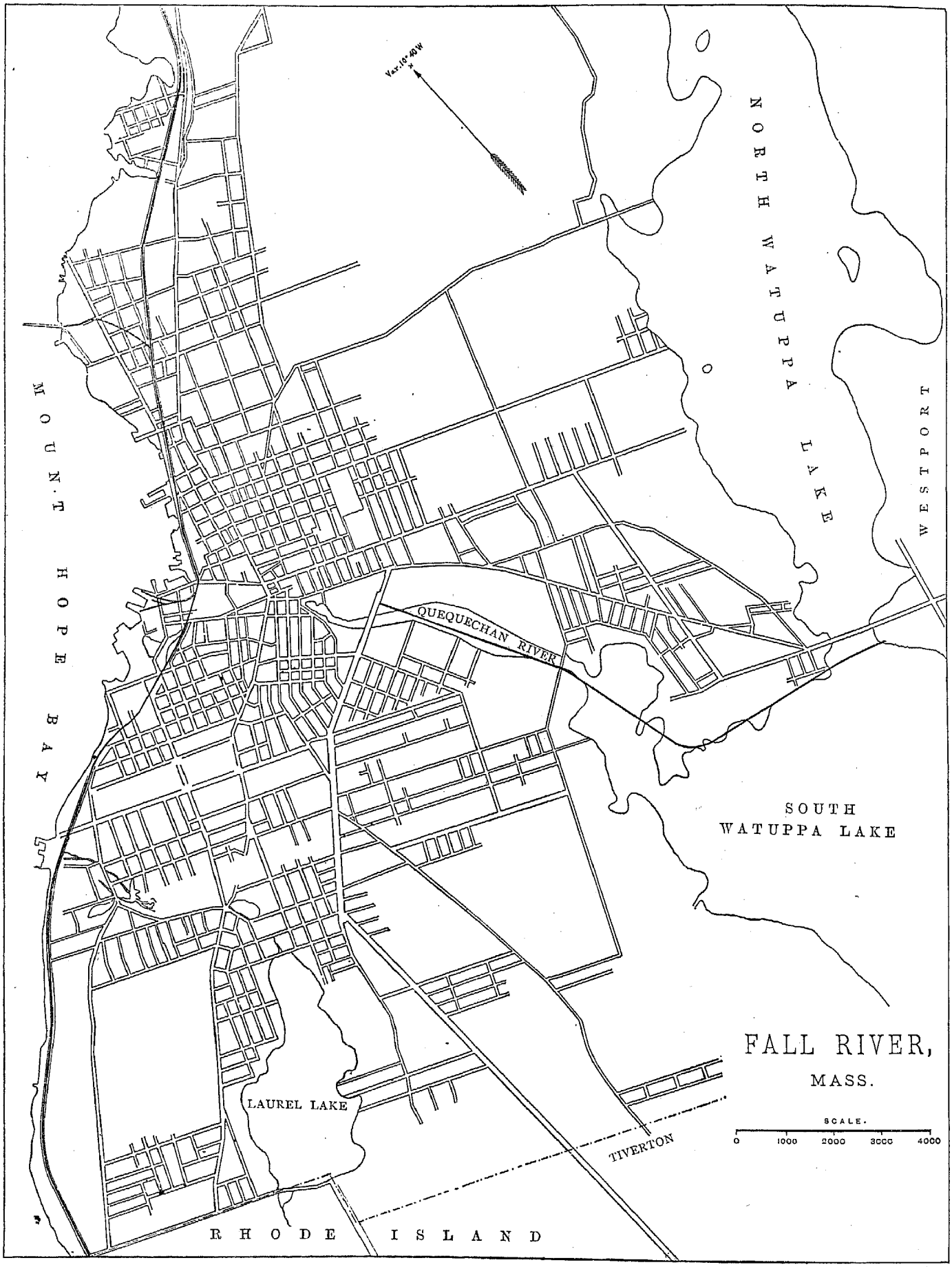
There was no extraordinary increase in the population or importance of the two towns created out of the Plymouth grants during the century succeeding their original settlement. The inhabitants were generally engaged in agriculture and other industries incidental to a rural community, and to some extent in seafaring pursuits. For some years the center of population was at a point a little south of the small tributary of the Taunton river known as Mother's brook, not far from the extreme northern boundary of the grant. At the southern boundary a colony was gathered, which began to be called Fall River, and, though it had been gradually increased from time to time by the arrival of new settlers, the immigration had, in spite of the excellent harbor, water-power, and natural advantages of the place, almost ceased, and in 1803 there were but 8 houses and some 100 inhabitants at this point. In this year, by an act of the legislature, a considerable portion of the ancient proprietary of Freetown, including the small settlement mentioned above, was detached, incorporated as a town, and named Fall River—a name it held for a year, then changed to Troy, by which it was known for thirty years, when it resumed its original name.

The question as to boundaries in dispute between Massachusetts and Rhode Island, due to an original conflict of royal patents granted to the provinces, remained unsettled even after colonial independence was established—succeeding commissions, in 1791 and 1844, being unable to determine the matter. The difficulty grew greater as the manufacturing enterprise in Fall River developed, annually adding both to the population and to the capital absorbed in special industries, and a portion of Tiverton exercised jurisdiction over and claimed taxes from a considerable part of its people and property. In 1854, the thriving town, having attained the conventional dignity of population, was made a city, and the complications became yet more serious. It was not till 1861 that a solution of the difficulty was reached and the boundary correctly adjusted, and Fall River, no longer obliged to acknowledge the jurisdiction of two states, found herself richer in territory by 9 square miles, in population by 3,593 persons, and in taxable property by $1,948,378.

In 1810 the population of Fall River (Troy) was over 1,000, and in the following year Colonel Joseph Durfee and a few others erected a small mill on the ground which is now the northeast corner of Globe and South Main streets. The success of this initial enterprise was not great at any time, and though it was the first cotton-mill in the town, it was not until after the war of 1812 that the manufacture of cotton, which has since grown to such proportions and has been the mainspring of the city's rapid increase and present prosperity, can be said fairly to have begun. In 1813 the first regular cloth-manufacturing enterprise was inaugurated by the organization of two companies, "The Fall River" and the "Troy Cotton and Woolen" manufactories—the former with a capital of $40,000 and the latter of $50,000. Both companies were formed in the month of March, and about 50 per cent. of the amount needed was quickly taken up by the people living in the neighboring towns and villages.

The Fall River mill was completed and began operations in October. It was built at the head of the third fall above tide-water, was 60 by 40 feet in dimensions, 3 stories high, and intended for 1,500 spindles. The Troy Cotton and Woolen Company obtained its charter February 22, 1814, and began operations the middle of March the same year, the building having been completed the previous September. The mill was built of stone gathered from the neighboring fields, and was designed to run 2,000 spindles. It was 108 by 37 feet, 4 stories high, and was located at the foot of the falls. Early in 1817 the first power-loom went into operation in the Fall River mill, and the last quarter of 1820 found power-looms working in the mill of the Troy Company. At this time there were not more than 70 operatives all told employed in the two mills, but already the owners had begun the building of tenements for the better comfort of their operatives. These tenements were built large enough for four families each, and were near the mills. The next ten years, 1820–'30, beheld a decided advance of the Fall River manufactures. During this period were organized the Pocasset Manufacturing Company, the Annawan and Massasoit, the Fall River Print Works, a satinet factory, iron-works, and the Watuppa Reservoir Company, besides several minor establishments, while additions were made to the older mills, and their producing power was increased. At first only Americans worked in the mills, but after the print-works went into operation English and Scotch came in. The increase of duty on textile fabrics in the latter part of the decade gave an upward impetus to all manufactures


FALL RIVER, MASS.
IN 1812.
0 500 1000 2000 3000 4000
Slades Ferry
Deacon's Point
TAUNTON RIVER
Durfee Warf
North Line of Rooman Farm
Deer Park
South Line of Rooman Farm
Peaked Rocks
Round P.
Line of Division St
Old Flats
WATUPPA POND
Narrows


Var. 14° 40' W
NORTH WATUPPA LAKE
WESTPORT
MOUNT HOPE BAY
QUEQUECHAN RIVER
SOUTH WATUPPA LAKE
LAUREL LAKE
TIVERTON
RHODE ISLAND
FALL RIVER,
MASS.
SCALE.
0 1000 2000 3000 4000

of cotton goods. From this time on the increase of the city was marked. New enterprises were continually being organized, while those already in operation made such additions and changes in their machinery as the advancing demand for their products called for. The disastrous fire of 1843, and numerous other losses from the same cause, as well as several severe business depressions, failed to check the steady growth of this important industry, while railroad and steamboat lines stretched out farther and wider as the necessities for new markets arose.

With the increase of wealth and skill in manufactures and the entrance upon the stage of action of younger men of enterprise and ambition, new projects were formed, and as the older mills occupied all available space upon the river-banks, new situations were sought out and appropriated, first on the margins of the ponds to the south and east of the city, and afterward in the northerly and southerly sections, on the banks of Taunton river and Laurel lake. In 1870 the number of incorporated companies was 18, having a capital of over $3,000,000, running nearly 700,000 spindles. Notwithstanding the number of mills in the city, the two following years showed a large increase. During that time 15 new corporations were formed, land was purchased, laid out into mill-sites and tenement lots, foundations were put in, and the massive walls raised story by story. The machinery was contracted for, received, and put in, and in 1873 the busy hum of more than 1,000,000 spindles rose in the air. The city passed through a long and disastrous period of depression from 1873 to 1879, many of the mills being idle; but in the latter year the tide turned, business came rapidly up, and in 1880 Fall River had in cotton manufactures alone 33 corporations operating 45 mills, containing 3,621 looms and 1,364,191 spindles. The mills use 163,000 bales of cotton and turn out 392,000,000 yards of cloth annually, and give employment to over 14,000 operatives. The pay-rolls have a monthly aggregate of about $300,000.

On July 2, 1843, a most disastrous fire swept over nearly 20 acres of the central portion of the town, the population being then less than 10,000, and destroyed nearly all the business blocks. The loss was estimated at the time at more than $500,000. Since then many severe fires have occurred and some of the largest manufacturing establishments have been burned. The losses, however, were quickly repaired and new buildings sprang up from the ashes of the old.

Until 1861–'64 the population was chiefly American, but since then the rapid growth of the cotton manufactures has drawn to the city large numbers of foreign operatives, principally Irish, English, and French Canadians. The great influx of Canadians began during the war, when so many operatives entered the army, and when the high rates of wages, due largely to the war bounties, made an opening for them at tempting wages. The actual foreign-born population now comprises 48 per cent. of the total population.

FALL RIVER IN 1880.

The following statistical accounts, collected by the Census Office, indicate the present condition of Fall River:

LOCATION.

Fall River lies in latitude 41° 43′ north, longitude 71° 9′ west from Greenwich, at the mouth of the Taunton river, where it empties into Mount Hope bay—the northern arm of Narragansett bay—about 23 miles from the ocean. The business center of the city has an altitude of 120 feet above mean sea-level. The lowest point is tide-water and the highest 275 feet above sea-level.

HARBOR.

Mount Hope bay, which forms the harbor of Fall River, has a sufficient draught of water for vessels drawing 22 feet, is easy of access, and of ample capacity for a large fleet. Daily communication is maintained by steamboat with New York, Newport, Bristol, and Providence, and there are semi-weekly steamers between the city and Philadelphia.

RAILROAD COMMUNICATIONS.

Fall River is touched by the following railroads:

The Old Colony railroad, connecting with Boston, Lowell, and Fitchburg on the north, and Newport on the south.

The Fall River, Warren, and Providence railroad, to Bristol and Providence on the west.

The Fall River railroad, to New Bedford on the east.

TRIBUTARY COUNTRY.

The country in the vicinity of the city is mostly devoted to agricultural pursuits. The farms average from 20 to 100 acres each, and supply the city with milk, butter, eggs, and vegetables. About 5 miles north of the city are extensive iron-works, which are of considerable benefit to the local trade.

TOPOGRAPHY.

The soil is composed principally of sand, gravel, and gravelly loam, interspersed with numerous bowlders, and resting generally on a solid stratum of granite rock which is at no place many feet below the surface, and which frequently crops out in extensive ledges. The country is hilly, the elevations within a radius of 5 miles varying from tide-water to 355 feet above sea-level. The natural drainage is generally very good, the greater part of the area of the city sloping rapidly toward Taunton river and Mount Hope bay. A portion of the city, however, will require an artificial drainage constructed carefully on scientific principles. This is the territory that slopes toward Watuppa lake, which is situated about 2 miles east of the business center, and which is used for the water-supply of the city. The water of the lake is now remarkably pure, and in order to keep it so it will be necessary to construct an intercepting sewer along its shores to carry the sewage-matter from the adjacent territory to one of the main sewers emptying into tide-water. The lake is 129 feet above sea-level, its shores rising gradually from 200 to 350 feet above tide-water. It is 4 miles long and from one-half mile to a mile and a half wide, with a water-shed of 31.25 square miles (including the area of the lake, which is 5.39 square miles). Tributary to the lake are three ponds with a total area of 400 acres, but the greater part of the water is supplied by springs. There is very little marshy land in the vicinity of the city. The country within a radius of 5 miles is wooded, except on the west and southwest, where Mount Hope bay and its many tributaries present a large expanse of water.

CLIMATE.

Highest recorded summer temperature, 93°; highest summer temperature in average years, 90°; average mean of three summer months for last five years, 69.09°. Lowest recorded winter temperature −4°. The temperature seldom drops many degrees below zero, the average mean of three winter months for the past five years being 30.18°. The climate is much more uniform than that of Boston, the range of temperature being less, probably due to the large area of water on the southwest and to the proximity of the Gulf stream. The influence of marshes is small, as there is very little low ground near the city. The hills north and east of the city temper the severity of the east winds which are so keenly felt in most cities of the Atlantic coast. The prevailing winds are northwest in winter and southwest in summer, generally producing a clear, bracing air, and with proper drainage the location of the city would be an unusually healthy one.

STREETS.

Total length, 95 miles. There are 4 miles finished in broken stone and 60 miles in gravel, the former costing $1 75 and the latter $1 per square yard. The cost of keeping each in good repair, and the relative facility with which each is kept clean, is not stated. Broken stone is reported to make the best road and to be more economical than gravel. Sidewalks are of concrete and flag-stones, and the gutters are of cobble-stones. Trees are planted at the sides and in the center of the streets. The work of construction and repair of streets is done by the day, the appropriations for the last five years averaging $81,753 63 each year. The experience of the superintendent of streets indicates a preference for day work, as it is done much better and is fully as cheap, giving the city a chance to employ a large number of men that would otherwise have to be maintained by the pauper department. Both a steam stone-crusher and a roller are used, and give very good satisfaction, the roads being reported to have improved 20 per cent. since these came into use. There are no horse-railroads in the city. A line of omnibuses, with 5 vehicles, 18 horses, and employing 5 men, carries passengers at rates of fare varying from 5 to 10 cents. The number of passengers carried during the year was not stated.

WATER-WORKS.

The water-works are owned by the city, and cost to January 1, 1880, $1,432,906. The supply is taken from Watuppa lake (previously described under head of "Topography"), which has a daily flow of 35,000,000 gallons. The system is direct pumping into stand-pipe, the gate-house being placed in the lake in 10 feet of water, 225 feet from shore. The engine-house is large enough for four engines; only two, however, are now used—one a double horizontal condensing, with a capacity of 3,000,000 gallons daily, and the other a Worthington duplex, with a daily capacity of 5,000,000 gallons. There are two stand-pipes—one for high and the other for low service. The water in the former is raised 325 feet and that in the latter 285 feet above the sea-level. The pressure in the mains varies from 20 to 121 pounds to the square inch, and the average daily consumption is 1,300,000 gallons. There are 52 miles of service-pipe, 537 hydrants, 107 public and 2,390 private taps, and 1,372 meters. The meters in use comprise 327 Union rotary, 305 Desper, 24 Crown, 121 Ball and Fitts, 51 Worthington, and 544 Gem (the last are not now recommended), being 37 per cent. of the number of services. They are reported to give very satisfactory results in preventing the waste of water and making the assessment of rates more equitable. When meters are used the revenue is found to be $30 per million gallons, as against $13 per million in other cases. The cost of raising 1,000,000 gallons 1 foot high is 9.13 cents. The yearly cost for maintenance aside from the cost of pumping is $8,362, and the yearly income from water-rates is nearly $70,000.

GAS.

Gas is furnished by a private corporation, but no information regarding it was given. There are 883 street-lamps in the city—415 gas, 464 fluid, and 4 automatic. The total amount expended for street-lighting during the past year was $16,688 34.

PUBLIC BUILDINGS.

The city owns and occupies for municipal uses, wholly or in part, 1 city hall, 1 court-house, 3 police stations, 9 fire-engine houses, 33 school houses, 1 almshouse, and 1 hospital, with a total value of $1,500,000. The city hall is valued at $300,000, and is owned entirely by the city, none of the city and county buildings being owned in common.

PUBLIC PARKS AND PLEASURE-GROUNDS.

There are two parks in the city, with a total area of 66.6 acres, as follows:

South Park, about four-fifths of a mile from the city hall, running from Main street to the harbor between Middle street and Durfee avenue, has an area of 53.66 acres. About one-third of this is laid out as a parade ground, and the balance is unimproved.

Ruggles Park, about three-eighths of a mile easterly from the city hall, on Locust street between Linden and Robeson streets, area 12.94 acres, is unimproved.

The total cost of the land was $112,123 47, being $102,968 47 for South park and $9,155 for Ruggles park. The yearly cost for maintenance for the parks has averaged $4,414 95 a year for the past ten years. In 1879 but $1,720 75 was expended. The parks are controlled by a committee of the city government, consisting of two aldermen and three councilmen.

PLACES OF AMUSEMENT.

There are two theaters in the city—the Academy of Music, with a seating capacity of 2,050, and the Fall River opera-house, with a seating capacity of 1,200. They pay an annual license of $5 each to the city. In addition to the theaters there are five halls, viz, Music hall, Carrolton hall, Pocasset hall, Concert hall, and Clan-na-Gael hall. There are no concert-halls or beer-gardens in the city.

DRAINAGE.

Sewerage works in Fall River are constructed according to a regular plan. Most of the old drains were abandoned when the new system was adopted. The final disposal of the outflow of the sewers is into the Taunton river, and there is reported to be no serious inconvenience therefrom. The materials used in constructing sewers are brick, stone, and vitrified clay pipe, in the proportions of about 50 per cent. pipe and 50 per cent. brick and stone. Hollow invert blocks have been used in some instances and are perfectly satisfactory. Sewers are reported to be self-cleansing, but during long dry seasons some have been flushed. No account of the cost of flushing has been kept, but it is estimated that $25 will pay all the cost in any year. Mouths of sewers are fully exposed. Ventilation is provided for only by perforated manhole covers; but these are not a success on unpaved streets, unless the grade of the sewer is steep, on account of the large amount of dirt they admit. The cost of sewerage work is borne entirely by the city, no assessments being laid upon adjacent property. City ordinances make strict rules relating to the connecting of private drains as to the material and manner of laying. The least rate of inclination that can be allowed for drains not over 6 inches in diameter, carrying water-closet, kitchen, or other solid refuse, is half an inch in 2 feet. The discharge of steam or blow-off water from steam-boilers is forbidden in, and no privy-vault can be connected with, the public sewers, except through an intervening catch-basin, and the discharge-pipe must be high enough above the bottom to effectually prevent anything but the liquid contents of the vaults from passing into the drain. Every drain-pipe is required to be provided with a trap just before it leaves the premises, and to have an open connection with a drain-spout back of the trap to serve as an air-vent on the house side.

The city is built on a foundation of rock so near the surface that hardly any streets have been sewered without encountering it. Water has also been troublesome in the trenches, and these two causes have combined to make the sewerage of Fall River more expensive than that of most other cities. By reference to Table 2, on the following page, it will be seen that the 21½ miles of sewers, including 707 manholes and 254 catch-basins, have cost on the average 4.56 cents per foot, or $24,076 80 per mile.

The following tables give statistical information regarding the public sewers of Fall River to include December 31, 1880:

TABLE 1.—*Showing statistics of sewers built in the year* 1880.

Nature of excavation.	Size and materials.	LENGTH IN FEET.		Number of manholes.	Number of catch-basins.	Average cost per foot.	Total cost.
		Each.	Total.				
Sand and gravel	20-inch brick		1,130.57	12	2	(a)	$2,384 47
Marl and loam	12-inch pipe		292.10	2		$1 92	559 95
Loam	12-inch pipe		303.04	3		2 87	868 88
Loam	12-inch pipe		179.59	2	1	2 64	474 96
Rock and loam	12-inch pipe		828.64	6		6 10	5,055 45
Loam and marl	12-inch pipe		169.40	2		2 26	382 97
Rock and loam	12-inch pipe		256.61	3		2 80	718 56
Rock, loam, gravel, and water	27-inch brick		1,137.39	6	3	7 82	8,891 84
Rock, marl, and water	20-inch brick	35.66		1			
Rock, marl, and water	15-inch pipe	349.12	384.78	3		3 82	1,469 04
Sand and marl	24-inch brick		519.10	3		2 71	1,407 79
Rock, gravel, and loam	12-inch pipe		440.37	3		3 78	1,664 78
Rock, gravel, and loam	12-inch pipe		476.58	3		4 22	2,009 08
Loam, gravel, and water	27-inch brick	195.88		1			
Loam, gravel, and water	15-inch pipe	36.00			1		
Loam, gravel, and water	12-inch pipe	295.00	526.88	3	1	5 25	2,767 28
Rock and loam	12-inch pipe		330.10	3		7 22	2,383 78
Loam and gravel	12-inch pipe		324.87	3		2 92	949 06
Totals and average			7,300.08	59	8	4 38	31,986 99

a Brick furnished by the Old Colony Railroad Company.

TABLE 2.—*Showing length and cost of sewers built in each year from* 1857 *to* 1880, *inclusive.*

Year.	Length in feet.	Number of manholes.	Number of lamp-holes.	Number of catch-basins.	Average cost per foot.	Total cost.	Year.	Length in feet.	Number of manholes.	Number of lamp-holes.	Number of catch-basins.	Average cost per foot.	Total cost.
1857	1,959.00			2		$5,497 87	1874	9,329.25	51		12		$70,352 95
1859	175.00					504 09	1875	14,753.13	98		29		72,233 20
1860	557.00			5		1,496 31	1876	23,438.08	175		18		99,645 25
1864	1,077.00	3		3		(a)	1877	15,336.52	114		8		60,554 34
1866	250.00			2		(a)	1878	17,638.74	109		5		43,769 57
1866	1,977.00	6		5		15,103 22	1879	8,303.25	49	1	15		44,001 08
1869	453.00					1,929 53	1880	7,300.08	59		8		31,986 99
1870	3,384.50	15		11		19,554 81	Total	113,478.30	707	1	138	$4 43	502,995 74
1871	1,536.50	7		1		7,498 65	Cost of additional				116		14,141 00
1872	3,705.50	14		14		14,729 69	Total				254	4 56	*b* 517,136 74
1873	2,304.75	7				14,138 19							

a Paid by the Old Colony Railroad Company.

b Average cost per mile, $24,076 80.

TABLE 3.—*Showing total length of each kind and size of sewer in Fall River, December* 31, 1880.

Size.	LENGTH IN FEET.				Size.	LENGTH IN FEET.			
	Stone.	Brick.	Vitrified clay pipe.	Cast-iron pipe.		Stone.	Brick.	Vitrified clay pipe.	Cast-iron pipe.
54 inches		140.00			48 × 60 inches		27.00		
50 inches		1,286.80			45 × 54 inches		170.00		
45 inches		484.00			42 × 48 inches		827.00		
42 inches		434.00			36 × 48 inches	175.00			
40 inches		2,002.10			33 × 48 inches	1,785.00			
36 inches		2,551.38			32 × 48 inches		569.25		
33 inches		1,282.70			33 × 42 inches		290.12		
32 inches		4,824.68			36 × 36 inches	103.00			
30 inches		2,052.25			33 × 39 inches		478.50		
27 inches		3,020.53			31 × 40 inches	275.00			
24 inches		10,695.84		257.50	30 × 36 inches	350.00			
22 inches		357.00			26 × 35 inches		1,117.88		
20 inches		12,704.44			30 × 30 inches	1,679.00			
18 inches		979.00	993.60		27 × 30 inches		678.00		
16 inches				60.00	26 × 31 inches		1,396.00		
15 inches			12,284.37		24 × 32 inches		327.50		
12 inches		137.00	45,083.05	72.00	24 × 27 inches		200.00		
10 inches				68.10	24 × 24 inches	32.75			
8 inches			76.87		Total	4,399.75	49,633.06	58,987.89	457.60

The total length of sewers December 31, 1880, was 113,478.3 feet, or 21.49 miles.

CEMETERIES.

There are 14 cemeteries and burial-grounds within the corporate limits of the city, as follows:
Oak Grove, on Locust street, between Pine street and Oak Grove avenue, is owned by the city.
North Burial-ground, on North Main street, is also owned by the city.
Friends', corner of Hurd and North Main streets, is owned by the Society of Friends.
Catholic.—At north end of 6th ward, on Highland avenue; area, 60 acres.
Catholic.—In 1st ward, in the extreme southern part of the city, on Amity street; area, 6¼ acres.
The two last-named are owned by the Catholic church.
Catholic.—On Ferry lane, just north of the North burial-ground.
The other 8 are small burial-places: 1 near Purchase and Pine streets; 1 near Central and Green streets; 1 near Park and Forest streets; 1 near Buffington street and the Eight-Rod way; 1 corner of the Six-Rod way and Stafford road; 1 on Stafford road near the city limits; 1 on New Boston road, and 2 on Bedford road near the lake.
The total number of interments during the past 11 years is 11,981. In 1880 there were 1,356.
Nothing definite could be learned regarding interments, except that permits are required, and that no limit of time after death is set, except in cases of death from a contagious disease, in which event the interment must take place the same day. The cemeteries owned by the Catholics are governed by the rules of the Roman Catholic Church, and that owned by the Friends by the rules of that society. The cemeteries owned by the city—Oak Grove and the North burial-ground—have each a superintendent, and are controlled by the mayor and aldermen.

MARKETS.

There are no public or corporation markets in Fall River. The city owns about 34 rods of land near its center, where wagons are allowed to stand for the sale of any marketable goods.

SANITARY AUTHORITY—BOARD OF HEALTH.

The chief sanitary authority of Fall River is the board of health, created under state laws. The board consists of 3 members—2 appointed annually by the mayor and aldermen, and the city physician. The annual expense, in absence of an epidemic, varies. In 1880 it was $2,362 61. During the prevalence of an epidemic the expense may be increased to any amount required. The authority of the board, as defined by state laws, is the same as that vested in the mayor and aldermen when no board of health exists. In absence of an epidemic the board has general supervision over the sanitary condition of the city, can appoint such assistants as it deems necessary, and has special care of all house-drainage. In time of an epidemic the authority of the board is unlimited. The chairman of the board, with a yearly salary of $250, is the chief executive officer. The city physician receives no salary for his duties as a member of the board. The clerk receives $75 a year, and an agent is employed at $200 a year. Nuisances, when found or reported, are inspected and a notice to abate is served. In cases of defective house-drainage, privy-vaults, cesspools, and sources of drinking-water, an examination is made by the board, and the owner or agent of the property is required to correct defects. The highway department has charge of defective sewerage, street-cleaning, and the keeping and removal of garbage.

INFECTIOUS DISEASES.

Small-pox patients are removed to the small-pox hospital on Bardsly street, or quarantined at home. During the past year several cases occurred in the city and both systems were used. Where quarantine was adopted it was made effectual by a guard kept on duty night and day. Scarlet-fever patients are quarantined at home. In case of a contagious disease breaking out in the public and private schools, the board examines the schools if circumstances seem to warrant it. Vaccination is compulsory, and is done at public expense for those unable to pay. The registration of diseases, births, and deaths is governed by state laws.

REPORTS.

The board reports annually to the city council, and this report is published with the regular city documents.

MUNICIPAL CLEANSING.

Street-cleaning.—The streets are cleaned at the expense of the city and with its own regular force. The work is done wholly by hand, no sweeping-machines being used. They are cleaned every two weeks, but how efficiently is not stated. The annual cost to the city is $4,500. The sweepings are used for filling, and the street commissioners report that the system, though expensive, works well and causes no complaint.
Removal of garbage and ashes.—The city, with its regular force, removes all garbage and ashes once a week. No special rules regulate the conservancy of garbage, which can be kept in the same vessel with ashes. The garbage and ashes are used for filling. The annual cost of this work is $3,000, and no injury to the public health is reported from the improper handling, keeping, infrequent removal, or improper final disposal of the garbage.

Dead animals.—The death of any animal within the city must be reported to the board of health, which designates a proper place for its burial. No account is kept of the cost of this service, though the report of the board for the past year has an item of $291 50 for "burying dead animals". The system is reported as satisfactory.

Liquid household wastes.—Chamber-slops and laundry and kitchen wastes are disposed of in the same way, nearly all going into the sewers, none being allowed to pass into the gutters, and only a small portion going into cesspools. There are no cesspools in the compact part of the city, as they are used only where sewers do not extend. They are cleaned out on the "tub" system. The gutters are flushed occasionally. No contamination of wells from the underground escape of the contents of cesspools is reported since the introduction of a public water-supply.

Human excreta.—The majority of the houses in the city are provided with water-closets, which deliver into the public sewers. In places away from the sewers privy-vaults are used to some extent. They are all made water-tight, and must be emptied in air-tight tubs by persons licensed for the purpose. The night-soil is taken to the country and used for manure, none of it being allowed on the gathering-ground of the public water-supply.

Manufacturing wastes.—No rules govern the disposal of liquid or solid manufacturing wastes. One print-cloth mill empties its refuse and dyes directly into the harbor.

POLICE.

The police force of Fall River is appointed and governed by the mayor and aldermen. The city marshal is the chief executive officer. He has command of the force, governs it in accordance with rules and regulations, and sees that all laws and ordinances are enforced; his salary is $1,300 per annum. The balance of the force consists of 1 assistant marshal and 1 captain; salaries, $912 50 each a year; 5 sergeants, each, $2 25 a day; 1 clerk, at the same salary; and 5 station-housekeepers and 56 patrolmen, $2 per day each. The members hold office till removed by death, resignation, or for cause. The uniform is of dark-blue cloth, with gilt buttons and a cap of the regulation pattern. The cut, number of buttons, and decorations of coat and hat vary with the rank of the officer. Each man furnishes his own uniform—the city furnishing the cloth at 25 per cent. below the cost price—and is equipped with a club and a whistle. The force is divided into a day and a night watch—the former from 8 a. m. to 6 p. m. and the latter from 6 p. m. to 8 a. m. During 1880 the force made 1,817 arrests, the principal causes being assault and battery, drunkenness, disturbing the peace, violation of city ordinances, and larceny. The cases were disposed of generally by fines. The amount of lost or stolen property recovered by the police and returned to the owners was $16,249 40. During the year, 683 station-house lodgers were accommodated, against 924 in 1879, and free meals to the value of $25 were given them. The police are required to co-operate with all other departments in the interest of the city. The total expense to the city for the police, in 1880, was $54,436 33.

FIRE DEPARTMENT.

The report of the chief engineer for 1880 shows that the fire department consists of 1 chief engineer, 1 assistant engineer, 3 district engineers, and 132 men, 20 of whom are permanently employed. There is in use 15,800 feet of hose, of which 3,000 feet is carbolized rubber hose reported unserviceable; 10,800 feet is cotton rubber-lined hose in good condition; 500 feet of the same material in poor condition; 500 feet of linen hose in fair condition; and 1,000 feet of 2-inch leather hose still serviceable. The department has 27 horses. The apparatus and general equipments are in good working order. In active service there are 5 steamers, 4 four-wheeled reels, 4 two-wheeled reels, 2 hook-and-ladder trucks, and 1 coal-supply wagon. Held in reserve, but ready for use, are 2 steamers and 2 two-wheeled reels perfectly equipped. During the year the force has answered sixty alarms. The total loss from fires was $19,762 54. A telegraph alarm, with 78 signal-boxes, is used. The total expense of the department for the year 1880 was $34,936 66.

PUBLIC SCHOOLS.

There are in Fall River 33 public school-houses, divided into 121 separate schools, as follows: 1 high, 21 grammar, 31 intermediate, 59 primary, and 9 suburban.

The following table shows the attendance, etc., at the day-schools, from the report of the superintendent of schools for 1880:

Schools.	Whole number of pupils enrolled.	Average number belonging.	Average attendance.	PERCENTAGE OF ATTENDANCE—		TEACHERS.	
				To whole number enrolled.	To average number belonging.	Male.	Female.
All schools	9,363	6,559	5,835	64.9	90.9	10	144
High	371	267	261	70.4	97.8	6	2
Grammar	1,333	1,046	978	73.4	93.5	4	21
Intermediate	2,143	1,503	1,358	63.4	90.4	.....	36
Primary	5,140	3,489	3,018	58.7	86.5	.....	76
Suburban	376	254	220	58.5	86.6	.....	9

In addition to the above, there are 16 evening schools with 32 teachers, and 3 evening drawing-schools with 7 teachers. The statistics as to attendance, etc., were not given.

COMMERCE AND NAVIGATION.

[From the reports of the Bureau of Statistics for the fiscal years ending June 30.]

Customs district of Fall River, Massachusetts.	1870.	1880.
Total value of imports	$7,003	$18,220
Total value of exports:		
Domestic	$2,967	None.
Foreign	None.	None.
Number of immigrants	None.	None.

Customs district of Fall River, Massachusetts.	1870.		1880.	
	Number.	Tons.	Number.	Tons.
Vessels in foreign trade:				
Entered	9	1,413	20	3,044
Cleared	5	615	17	3,153
Vessels in coast trade and fisheries:				
Entered	563	987,321	732	1,183,743
Cleared	544	984,214	683	1,180,647
Vessels registered, enrolled, and licensed in district	113	28,469	124	34,663
Vessels built during the year	None.	None.	None.	None.

MANUFACTURES.

The following is a summary of the statistics of the manufactures of Fall River for 1880, being taken from the tables prepared for the Tenth Census by William J. Burt, special agent:

Mechanical and manufacturing industries.	No. of establishments.	Capital.	AVERAGE NUMBER OF HANDS EMPLOYED.			Total amount paid in wages during the year.	Value of materials.	Value of products.
			Males above 16 years.	Females above 15 years.	Children and youths.			
All industries	258	$25,076,518	8,232	6,723	2,130	$4,659,077	$10,552,192	$18,013,584
Blacksmithing	20	30,970	70	.....	4	29,552	23,550	80,000
Boots and shoes, including custom work and repairing	20	3,950	23	.....	.....	8,733	6,730	20,928
Bread and other bakery products	10	10,500	24	4	.....	11,874	13,560	33,000
Carpentering	15	15,050	188	.....	.....	54,661	178,250	254,750
Carriages and wagons	6	18,400	35	.....	.....	8,900	17,700	40,700
Clothing, men's	10	30,500	17	28	.....	16,300	27,700	65,500
Coffins, burial cases, and undertakers' goods	5	20,000	10	.....	.....	6,000	30,000	50,000
Cotton goods	33	22,707,043	5,077	6,402	1,988	3,705,420	8,110,736	14,510,007
Dentistry, mechanical	5	8,500	9	.....	.....	4,500	9,000	24,000
Foundery and machine-shop products	17	284,255	334	38	3	132,403	166,897	363,707
Liquors, malt	3	121,000	58	.....	.....	27,070	139,850	224,184
Lumber, planed	3	10,100	17	.....	.....	5,160	2,200	11,500
Masonry, brick and stone	5	5,400	148	.....	.....	29,400	24,650	62,530
Painting and paperhanging	14	28,750	107	.....	1	22,710	33,850	86,905
Photographing	6	7,000	.....	9	.....	2,700	4,000	12,000
Plumbing and gasfitting	4	13,300	54	.....	2	16,580	67,300	118,100
Printing and publishing	7	66,400	57	7	2	28,457	39,000	90,800
Saddlery and harness	5	8,200	18	.....	.....	6,950	13,000	25,752
Slaughtering and meat-packing, not including retail butchering	4	100,000	53	.....	.....	21,500	360,650	425,135
Tinware, copperware, and sheet-iron ware	12	10,400	36	.....	.....	12,654	30,499	58,078
Watch and clock repairing	7	21,000	10	.....	.....	7,500	10,000	30,000
All other industries (*a*)	38	1,555,800	1,287	175	130	499,253	1,243,130	2,316,008

a Embracing belting and hose, leather; bookbinding and blank-book making; boxes, fancy and paper; brooms and brushes; cooperage; cordage and twine; cotton-ties; drugs and chemicals; dyeing and finishing textiles; electroplating; files; flouring- and grist-mill products; furniture; hosiery and knit goods; iron and steel; lithographing; lumber, sawed; marble and stone work; sash, doors, and blinds; shipbuilding; soap and candles; steam fittings and heating apparatus; tobacco, cigars, and cigarettes; upholstering; wood, turned and carved; and woolen goods.

From the forgoing table it appears that the average capital of all establishments is $97,195 80; that the average wages of all hands employed is $272 70 per annum; that the average outlay in wages, in materials, and in interest (at 6 per cent.) on capital employed is $64,790 15.

FITCHBURG,

WORCESTER COUNTY, MASSACHUSETTS.

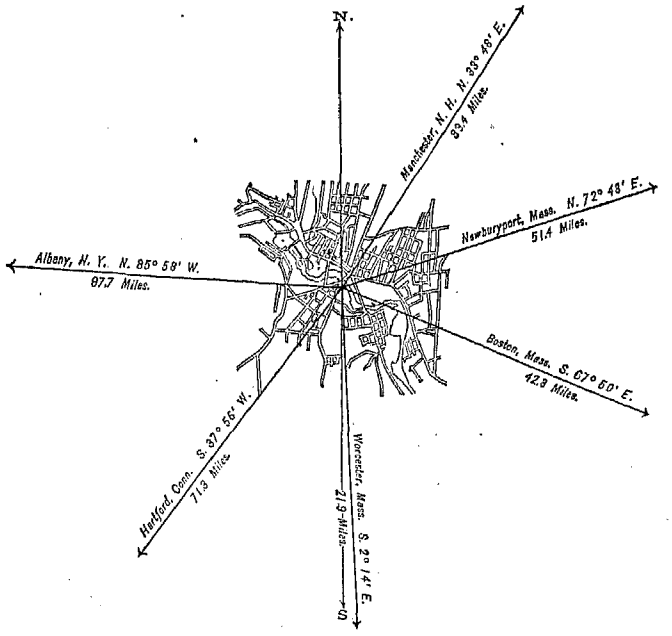
POPULATION

IN THE

AGGREGATE,

1800-1880.

	Inhab.
1790	.....
1800	1,390
1810	1,566
1820	1,736
1830	2,169
1840	2,604
1850	5,120
1860	7,805
1870	11,260
1880	12,429



POPULATION

BY

SEX, NATIVITY, AND RACE,

AT

CENSUS OF 1880.

Male	6,052
Female	6,377
Native	9,958
Foreign-born	2,471
White	12,392
Colored	37

Latitude: 42° 35' North; Longitude: 71° 50' (west from Greenwich); **Altitude: 375 to 900 feet.**

FINANCIAL CONDITION:

Total Valuation: $9,029,393; per capita: $726 00. Net Indebtedness: $770,778; per capita: $62 01. Tax per $100: $1 78.

HISTORICAL SKETCH.(a)

The Indians of New England were originally divided into five principal tribes, their combined power extending into the limits of the present county of Worcester. There were also several small tribes—the Nipmucks, in the southern and southwestern portions of the county, and the Nashuas, in the vicinity of what is now Lancaster, being among them—who were under their own sachems, but owned allegiance to their more powerful neighbors. The Indian population was so extremely sparse when this portion of Massachusetts began to be settled by the whites that no special tribe or band seems to have used it for a dwelling-place, and by a tacit consent of all was made a general hunting-ground. In 1643 the region about what is now Lancaster was held by Sholan, a sachem of the Nashuas, who, for greater convenience of traffic, invited some of the people of Watertown to remove to his fertile regions. His request was complied with the same year, and in 1653, there being nine families settled at

a Taken from Torrey's *History of Fitchburg and Lunenburg.*

this period, the town of Lancaster was incorporated. Two years after, the town of Groton, on the east, was incorporated, and for a considerable time these towns remained the outermost settlements, the white population not extending beyond them. The Nipmuck and Nashua Indians remained at peace with the settlers till the breaking out of the King Philip war, when, owing to the pressure of their stronger brethren, they took up the hatchet and joined in the revolt.

In 1676 the Indians attacked Lancaster, and after destroying the town marched with their prisoners toward Canada. Among these unfortunates was one Mrs. Rowlandson, the minister's wife, and on her return from captivity she published an account of her journey through the wilderness. From this it is gathered that, in all probability, she passed the second night after the destruction of Lancaster on what is now known as "Rolleston hill", in the limits of the present city of Fitchburg, and there was compelled to witness the orgies of her savage captors as they celebrated the massacre. Taking all things into consideration, there is every reason to believe that Mrs. Rowlandson was the first white person who ever visited the spot on which Fitchburg now stands.

On December 7, O. S. (December 18), 1719, the general court of Massachusetts voted that two new towns, not exceeding 6 square miles each, be laid out in as regular forms as the land would allow, and settled in a defensible manner, on the westerly side of the Groton west line. A committee was appointed and "fully empowered to allot and grant out the land contained in each of the said towns (a lot not to exceed 250 acres) to such persons and only such as will effectually settle the same within the space of three years next ensuing the laying out and granting such lots by the committee, who are instructed and directed to admit 80 families or persons in each town at least, who shall pay to said committee for the use of the province the sum of 5 pounds for each allotment which shall be granted and allotted as aforesaid, and that each person to whom said lot or lots shall be granted or laid out shall be obliged to build a good dwelling-house thereon and inhabit it; and also to work up and fence in 3 acres of land at least within the term of three years". Provision was also made for reserving a convenient lot for the minister, one for the school, and one for Harvard college, of 250 acres each. The two townships were designated by the committee as the north and the south. The former was afterward incorporated under the name of Townsend, in the county of Middlesex, while the latter included the present towns of Lancaster, Fitchburg, and Ashby, and was known as the Turkey Hills, a name given to it on account of the large number of wild turkeys that came there to feed on the acorns and wild chestnuts, that were very abundant.

When the committee first came to carry out the provisions of the order of the general court, they found one settler already established at Turkey Hills, a man named David Page, who, with his family, had selected one of the best sites in the place, on the southerly side of Clark's hill. He had built a comfortable house, well fortified by a palisade of logs pierced with loop-holes for muskets, and had turned a small brook from its natural course, making it flow some distance under ground and then through his "garrison". Page, however, had no title to his land, but when the committee met at Concord for the purpose of granting lots, he was present, and succeeded in securing two lots, one for himself and the other for one of his sons. The committee met and began their duties a few days after the passage of the order by the court, the survey being completed in April of the following year. In May the committee met at Concord, and the grantees came together and entered their names for lots. They were obliged to pay down 50 shillings, paper ($1 11), and a like sum when the lots were finally assigned or drawn; any one failing to make the second payment lost not only his lot, but also his first payment. The 80 lots were at once subscribed for, and the first amount was promptly paid. Only one subscriber was put down as coming from Turkey Hills—Page, who took two lots, the other 78 subscribers being from Concord, Groton, Needham, Newbury, Bradford, Reading, Boxford, Weston, Watertown, etc. In May of the following year (1721) the committee again met at Concord, the grantees drawing their lots and paying up in full. At this time 5 more grantees were admitted, and the number, though the south township was reported as nearly full, was afterward increased to 90. The order from the general court specified 250 acres for each grantee, and the limits of each township were not to exceed 6 square miles; but it appears that the lines were not very strictly adhered to, for when the work of allotment was finally completed, Turkey Hills district alone extended 12 miles in length by 6 in breadth, and contained upward of 45,000 acres, all of which had been taken up by the original grantees or their assignees. Nothing was said regarding the very liberal construction placed on the order of the court, nor were the boundaries of the town interfered with. The authorities were probably wise enough to think that a few miles more or less of land would not make any material difference when the first object was the settlement of a wilderness.

In 1724 the grantees began to move into the township, and in March, 1726, the committee was notified that 26 houses had been raised, 10 of which were occupied as dwellings. From the early records it appears that some years after the order of the court much trouble was occasioned by people who had taken up lands for speculation only, and who had made no improvements. This coming to the knowledge of the committee, they declared several of the lots forfeited, and at once resold them to persons who would better comply with the requirements of the grant, thus putting a stop to all land trades in an effectual manner.

In November, 1727, the committee directed that a meeting-house should be built, but at about this time the settlers came to the conclusion that the township should be removed from under the care of the committee, and pending the action of the court in the matter the building of the church was left in abeyance. In the following

year the act of incorporation was passed, and on August 1 the proprietors of Turkey Hills found themselves a town, in the county of Middlesex, under the name of Lunenburg—a name given in honor of George II, who the preceding year had ascended the English throne, one of his titles being "Duke of Lunenburg".

The same year the inhabitants voted to raise £200 ($88 88) for a meeting-house, and three years thereafter a pulpit and a body of seats were added. Persons who wanted pews were at liberty to build them at their own cost, and in 1733 it was voted to finish the galleries, and to build "stears up into them". While providing for the religious wants of the community the early settlers did not forget the probable evil-doers, for in 1732 the town voted "the sum of eight shillings for building a pair of stocks". In 1729 the town chose an agent to represent it in the consideration of the best place of dividing the county of Middlesex, as it was then deemed too large. Two years after, the general court made the division, and Worcester county was set off, Lunenburg being within its limits.

The subject of schools appears first to have received attention in 1732, when the clergyman was employed to teach school for three months in his own house. During the next year school was held in the houses of several of the settlers in rotation, and in 1735 the selectmen were directed to provide a suitable school-house and to "hire *school dames* as they shall see fit".

During the next twenty-two years Lunenburg increased but slowly, the depreciation of the currency and the French-Indian war from 1740 to 1750 having militated against her prosperity more or less. Still, however, she did increase. The condition of the roads in the town, which were little more than bridle-paths winding through the woods, and indicated by trees marked on one side, were gradually improved. New ones were opened to the adjoining towns, bridges were built, and at last the annual expense of maintaining the highways equaled the salary of the minister, viz, "60*l.*, lawful money", and was still increasing. In March, 1757, a petition was presented at the town-meeting to have the western part of Lunenburg set off and incorporated as a separate town, the inhabitants of that portion having come to the conclusion that they were able to manage their own affairs, and objecting, with reason, against having to travel from 5 to 10 miles to attend church or to even transact the ordinary business of the town. After considerable debate the town voted that the westerly portion be created into a new parish, with the meeting-house in the center. This did not satisfy the petitioners, and the request was persistently renewed several times, until finally, on January 25, 1764, authority was granted to take the request up to the general court. This was at once done, and nine days after, the act was passed incorporating the western half of Lunenburg as "Fitchburg", with all the privileges of a town, except that of sending a representative to the general court, Fitchburg and Lunenburg voting for one in conjunction. The people met and organized the town government on March 5. At the time of the incorporation the boundaries were set about the same as they now are. There were not more than 44 families, representing a population of 250 souls, all told; the dwellings in almost every instance were far apart, and the winds that swept down the valley of the Nashua river sighed through pines which here formed a dense forest. The origin of the name seems to be in some doubt, as it rests on the fact that there were two prominent men by the name of Fitch interested; one was John Fitch, who was the first man on the committee appointed to procure the act of incorporation, and had held one or two minor town offices, while the other was Colonel Thomas Fitch, a wealthy merchant of Boston, who owned extensive tracts of land in the county. The friends of each claimed the honor, and though the creation of the town is comparatively of recent date, this point must remain undecided. Within the first few years after Fitchburg was incorporated several families moved in, a church was built, a minister was engaged, schools were established, and the town took her place among her sisters of Massachusetts, under a guidance that cared for the spiritual as well as the temporal wants of her people. The town was but thinly peopled and money was not plenty, so the work of improvement went on but slowly, the authorities judging that it was better to build only what could be at once paid for. In 1767 a portion of the town was set off to form Ashby. From this time on to the stirring times preceding the Revolution, Fitchburg held her own, and though the population did not increase very fast, still it did not go backward. As early as 1768 a letter was received from the selectmen of Boston asking that an agent be chosen and sent to express the views, wishes, and determination of the town regarding the "revenue act" just being enforced by the parent government. Fitchburg and Lunenburg sent one representative, and though it does not appear that he received any special instructions, the subsequent proceedings show that Fitchburg, in common with the other towns of the state, was resolved to maintain her rights. In November, 1773, another letter was received from Boston "requesting the inhabitants of Fitchburg to pass such resolutions concerning their rights and privileges as free members of society as they were willing to die in maintaining, and to send them to Boston". Fitchburg responded promptly. On December 1 a town-meeting was called, a committee of seven was appointed to draw up resolutions, and an adjournment was taken to the 15th. On re-assembling the committee reported a set of resolutions thanking the citizens of Boston for their kindness in sending out the letters, determining to stand fast in their liberties and rights, no matter what the cost might be, denouncing all actions on the part of the mother country that seemed to savor of tyranny and injustice toward the colony, and advising that the sentiments of the town be given the fullest publicity. The report was at once accepted, ordered placed on the town records, and a copy forwarded to Boston. But Fitchburg did not depend on resolutions alone to show on which side of the balance she had determined to throw her influence,

for we find it recorded that in October of the following year $47 33 was paid by the town for powder, lead, and bullets, and in November, in compliance with instructions from the provincial congress, 40 men were enlisted to form a company of minute-men. On January 10, 1775, a delegate was chosen by Fitchburg to represent her in the provincial congress, which was to meet at Cambridge February 1, and at the same time a citizen was appointed to receive all articles that might be contributed for the poor of Boston who were suffering for their share in the earlier troubles.

On April 19, 1775, the sound of the first gun of the Revolution found the town ready. The news reached Fitchburg at 9 a. m. The alarm was at once sounded, and the minute-men, assembling promptly, took the line of march for Concord, some 50 strong. They arrived there after the action was over, but such had been their haste that they did not even stop for rations, a large wagon being loaded with supplies by the citizens and sent after them. On July 1, 1776, a town-meeting was called, and it was "*Voted*, That if the Honorable Continental Congress should, for the safety of the United Colonies, declare them independent of the Kingdom of Great Britain, that we, the inhabitants of the town of Fitchburg, will, with our lives and fortunes, support them in the measure". In May, 1778, the town opposed the articles of confederation sent out by Congress, and at about the same time the new state constitution was adopted by a vote of 22 to 4.

Fitchburg did her share in the war, and, in common with all the New England towns, suffered severely. After the declaration of peace, in 1783, a general stagnation of all kinds of business ensued. The colonies had a debt of $40,000,000, and no immediate prospect of paying it, while Massachusetts, for the purpose of maintaining her credit, raised her taxes to such a height that the people, finding they could no longer bear them, besieged the legislature with petitions for relief. No help coming from this quarter, what was known as "Shay's rebellion" was precipitated, and though the people of Fitchburg did not break out into open revolt, still they sympathized with the movement and made the collection of taxes in their town almost an impossibility. The trouble passed after the force headed by Shay had been dispersed, and as times grew better Fitchburg took her place as a quiet agricultural town. One of the principal circumstances that tended to retard the growth of the town in the earlier period of its existence was the expense for keeping the highways and bridges in repair. The rivers were also looked upon as great evils, and seemed to serve only to carry away the bridges over them at each freshet. In 1793 there were on the Nashua river a saw-mill, a corn-mill, a fulling-mill, and clothiers' works, a trip-hammer, and works for grinding scythes, all of which drew many people to the place from the surrounding country, and, with the through travel between Boston and Vermont, constituted the only thing calculated to encourage immigration not possessed by the neighboring towns. Still the place had the elements of future prosperity within her doors—the water-power afforded by the Nashua river and tributary streams—and it was only a question of time when they would be made to contribute toward the advancement of Fitchburg.

The first dam across the Nashua river was built a little before the incorporation of the town, and was but a poor one, that generally went under when a rise came down the river. On it, however, were the mills mentioned above—the first two having been put up soon after the dam was first built, the others during or after the Revolutionary struggle. In 1804 the Burbank paper-mill and dam were built, the mill going into operation the following year. In 1806–'07 a corporation for the purpose of erecting and working a cotton-mill came into existence, and began operations by throwing a brick dam across the river and putting up a mill 30 by 60 feet and 2 stories high. Owing to the fact that the owners of the mill did not have a proper title to both sides of the river the people on the other side interfered with the dam, and after several lawsuits the corporation failed. A mill was erected in 1813 and another in 1814. In 1823 the Red woolen factory was built, in 1826 a cotton-mill and a paper-mill went up, and in 1832 another woolen factory began operations. Several saw-mills and other small industries had, in the mean time, been built, but in spite of these industries the town did not make very rapid strides, the census of 1840 showing an increase of but a little over 2,000 in seventy-six years. The beginning had been made, and the next thirty years saw a rapid advance in population and wealth. The opening of the railroad to Boston in 1845 gave an impetus to the town. New industries were started and many of the older mills were enlarged, buildings were erected, streets were paved, water and gas were introduced, and on March 8, 1872, Fitchburg was incorporated as a city. Fitchburg had a good record during the war of the rebellion, and furnished 824 men for service, being 75 over her quota, 57 of whom became commissioned officers. Her war expenses were upward of $142,000, and to her dead she has erected a granite monument, surmounted by a bronze statue, the names of those who fell being engraved upon it.

There are no severe fires reported, and though the city has, in connection with the whole country, had periods of business depression, yet, from the great diversity of its industries and the absence of any large corporations, it has suffered less in this way than many of its neighbors. The descendants of the original settlers still remain in the majority, though, in common with nearly all manufacturing places, many foreigners have come in during the past few years. Its present condition is indicated by the following statistical accounts collected by the Census Office.


FITCHBURG,
MASS.
SCALE OF FEET.
0 200 500 1000
N.

FITCHBURG IN 1880.

LOCATION.

Fitchburg lies in latitude 42° 35′ north, longitude 71° 50′ west from Greenwich, in the northeastern part of the county of Worcester, and about 24 miles north of the city of Worcester, on the north branch of the Nashua river. Owing to the hilly character of the ground on which the city stands the elevations are varied. Dr. Fisher, in answer to the schedule from this office, gives the altitude above sea-level as averaging 700 feet—lowest point 375 and highest point 900 feet—while the Smithsonian Institution gives 484 feet as the city's altitude. The river on which Fitchburg stands is not navigable.

RAILROAD COMMUNICATIONS.

Fitchburg is touched by the following railroads:

The Fitchburg railroad and Hoosac Tunnel line, from Boston to Troy and the West.

The Cheshire railroad, from Fitchburg to Bellows Falls, and by connecting lines to Montreal.

The northern division of the Old Colony railroad, to Worcester, Boston, and New Bedford.

The first named of these roads has a large depot in the city, which is used as a union station by the other lines intersecting here. From the above it appears that Fitchburg has not much lacking in the way of communication with the East, West, North, and South.

TRIBUTARY COUNTRY.

With the exception of the manufacturing establishments, the surrounding country is largely agricultural. The soil is very broken, and much labor is required to subdue it thoroughly, but when once put in a good state of cultivation it produces heavy crops of potatoes and the various kinds of grain common to this section of the country. There is also an abundance of good pasturage which, in consequence of the moist soil, seldom fails. The chairman of the committee on agriculture, in his report to the board of trade for 1878, says: "The hay crop was heavy on well top-dressed fields, or on new fields which were in good condition when seeded; on neglected land the crop was light. The average was large and better than last year, and the product about 3,500 tons. The yield of milk was about 200,000 gallons. The corn crop * * * is about 8,000 bushels of shelled corn." It also appears that oats, rye, barley, potatoes, grapes, pears, and peaches were raised and gave good crops.

TOPOGRAPHY.

The city lies on the north branch of the Nashua river, being nearly equally divided by the stream, and can truly be called a city of hills. So close together are these hills that there is scarcely any meadow-land within its limits. The highest of these is mount Rollstone, which rises 300 feet above the plains, is nearly a mile in circumference, and is a mass of granite. Numerous small streams wind around and between the hills, affording excellent natural drainage. With the exception of mount Rollstone, the formation is gneiss and mica-slate, overlaid in part with a clayey subsoil, and in part with a gravel, the former carrying a strong loam and the latter a sandy loam. The area of the city is 17,879 acres; that of the township is much more. The surrounding country is more open than wooded, and the soil is the same as that on which the city is built. The elevations are also about the same as the city, but higher in the northwest than in the southeast. There are no marshes in the vicinity, but many ponds are scattered among the hills.

CLIMATE.

Dr. Fisher's record, extending over a period of twenty-four years, gives: Highest recorded summer temperature, 97°; highest summer temperature in average years, 87° to 97°. Lowest recorded winter temperature, —22°; lowest winter temperature in average years, —1° to —22°. The record of the Smithsonian Institution for eleven months of 1861 gives the mean annual temperature as 47.87°. The rainfall finds the valleys quickly, but, as much of the soil is retentive, artificial drainage is sometimes necessary. The prevailing winds are from the southwest in summer and from the northwest in winter.

STREETS.

Total length, 105 miles. Of these, thirty-eight hundredths of a mile is paved with a combination of stone blocks and cobble-stones—the center, equal to one-half the width, is laid with the blocks, the cobble-stones being on each side to the curb—fifty-eight hundredths of a mile is laid with broken stone, and all the rest are finished

in gravel. The stone blocks and cobble-stone pavement cost $1 44, the broken stone about 40 cents, and the gravel about 20 cents per square yard. The cost of keeping each in good repair, and the relative facility with which each is kept clean, were not given. Since the stone pavement was put down in 1867, the total amount spent on it for repairs has been inside of $200. The sidewalks are of brick, concrete, and plank, with granite edge-stones, and the gutters, varying in width from 3 to 4½ feet, are paved with cobble-stones. There has been no tree-planting along the sides of the streets for some years past, though formerly it was done by private enterprise. The construction and repair of streets is under charge of the superintendent of streets, and for the past ten years the annual cost has averaged $11,954 52 per year. In the work of construction there does not seem to be any preference between contract and day labor, but for repairs and maintenance the latter is always used. A stone-crusher is used for preparing material for the macadamized roads, and after it is spread an iron roller drawn by horses is run over it. There are no street railroads or omnibus lines in the city.

WATER-WORKS.

The works for water-supply are owned by the city, and cost $438,648 14. Water is taken from Scott's brook, where a storage reservoir of nearly 200,000,000 gallons capacity has been built, and conducted by gravitation through a brick conduit 2 feet in diameter to the distributing reservoir of 60,000,000 gallons capacity. No pumping is required, the distributing reservoir having a sufficient elevation to give a head of 373 feet for the high service, or 161.38 pounds to the square inch, and a head of 264 feet—114.23 pounds—for the low service. The average daily consumption is about 1,000,000 gallons, the annual cost of maintenance $5,713 15, and the annual income from water-rates $15,640 53. Water-meters are used to some extent, 106 being set, but as the total number of water-takers is 1,913, their use is not general enough to affect the consumption. There are 24 miles of street-mains leading from the distributing reservoir, and to these have been attached nearly 13 miles of service-pipes and 203 hydrants. The department has furnished the city during the past year with water to the estimated value of over $12,000, which, if added to the regular receipts, would materially increase them.

GAS.

The gas-works are owned by a private corporation. The average daily consumption is 26,000 cubic feet, and the charge to consumers is $3 per thousand. The city pays $20 a year for each street-lamp, 122 in number. There are also 50 gasoline lamps that cost $12 each per year to maintain.

PUBLIC BUILDINGS.

The city owns real estate, exclusive of the water-works, valued at $296,775, as appraised by the assessors at the close of the present year. This includes the school- and engine-houses, the city farm and buildings, park, and the city hall. The latter cost $52,830 45, and is owned entirely by the city.

PUBLIC PARKS AND PLEASURE-GROUNDS.

Monument Park, on Main street, between Hartwell and Fox streets, area 36,000 square feet, is owned by the city. It cost $80,000, including the monument occupying it and all improvements. The monument was erected in memory of those who fell in the late war, and $200 is appropriated annually for its care and maintenance. This park is controlled by the city council, but there are no special ordinances referring to it. There is also a small park on Main street opposite the Union depot, but no statistics could be procured concerning it.

PLACES OF AMUSEMENT.

City hall, with a seating capacity of 1,200, is used for theatrical performances, concerts, lectures, etc. The rental of the hall, which is $1,200 annually, carries a license with it. There are also Crocker hall, with a seating capacity of 600, and Board of Trade hall, seating 250. There are no concert- or beer-gardens in the city.

DRAINAGE.

Sewerage-works in Fitchburg are built according to a regular plan for a part of the city only. The final disposal of the outflow is into the Nashua river. The mouths of outfalls of sewers are fully exposed above the surface of the river. Ventilation is further secured by perforated manhole-covers. Hollow invert blocks for subsoil drainage have not been used. The materials of which sewers are built are brick and Akron-clay pipes of 12 inches and 15 inches diameter. Rates of fall are such that very little trouble has been caused by deposits. The cost of manholes and catch-basins and 25 per cent. of that of the sewers is paid by the city; the remaining

75 per cent. is assessed upon the owners of adjacent property on the basis of areas and valuation. Sewers are built under the direction of the superintendent of streets, and the cost of those built in 1880 is shown in the following table:

Sizes and materials.	Length in feet.	Average depth of cutting (feet).	COST PER FOOT.			Manholes, $50 each.	Basins, $60 each.	Total.
			Total.	For sewers.	For trenching.			
18 by 27 inches, brick..	264	11	$1 90	$0 90	$1 00	$50	$60	$611 60
12 inches, Akron pipe..	875	8	80	42	38	150	180	1,030 00
12 inches, Akron pipe..	679	7	75	42	33	150	240	899 25
15 inches, Akron pipe..	331	8	95½	62½	33	50	60	426 10
Total	2,140	.....	.....	.....	.....	.....	.....	2,966 95

CEMETERIES.

There are 4 public and 2 private cemeteries in the city:

Forest Hill Cemetery, on Mount Eleam road, 1½ mile southwest of the city, is public, and the largest, having an area of 25 acres.

Mount Laurel Cemetery, on the bank of the river, between Charles, Laurel, and Franklin streets, near the center of the city, is also public; area, 15 acres.

Old Cemetery, on South street near Cross street, is also public.

The *Roman Catholic Cemetery*, on Saint Bernard street near Boutelle street, area, 4 acres, is private.

The other two cemeteries, one public the other private, are small and out of use.

No record of the number of interments has been kept. There are no city ordinances regulating burials, and the matter of permits is regulated by state laws. The limit of time after death for the burial varies from two to four days, but depends upon circumstances. The depth of graves for adults is 4½ feet. In the Catholic cemetery lots are sold for a small sum, which goes to the church. There seem to be no regulations as to the care of lots, etc., each owner consulting his own taste.

MARKETS.

Fitchburg has no public or corporation markets.

SANITARY AUTHORITY—BOARD OF HEALTH.

The mayor and aldermen act as a board of health, with the city physician as adviser. In absence of an epidemic, no expense is incurred, and the duty of the board consists in maintaining a healthy sanitary condition of the city. During the prevalence of an epidemic the city council determines the authority of the board and the limit of its expenses. The mayor is chairman, and the chief of police the executive officer. No health officers or inspectors are employed, the city physician furnishing advice, the chief of police enforcing the health regulations and reporting nuisances. Nuisances are inspected whenever reported, and steps are taken for their removal. The board exercises control over defective house-drainage, privy-vaults, cesspools, and sources of drinking-water. The regulations provide that houses must have an underground drain for waste water, and a suitable privy and vault of sufficient size, and require them kept in good condition; and if deemed expedient the board can cause the drain to be connected with the sewer if the property is on its line. The board has no control over defective sewerage or street-cleaning, that being in the hands of a committee of the common council, but has absolute control over the keeping and removal of garbage. The board prohibits throwing any dead animal or other foul matter into any stream or pond within the city limits. All excrement must be removed at night between the hours of 9 p. m. and 4 a. m.

INFECTIOUS DISEASES.

During the past seven years there has been no case of small-pox in the city, and no regulation has been made concerning the disease. Scarlet-fever patients are quarantined at home, the board is notified of the case, and it is published in the daily papers. The school committee has power to close the schools at any time, and the board of health therefore does not interfere on the breaking out of contagious diseases in them. There is no pest-house. Vaccination is compulsory, and done at public expense only in pauper cases. The system of registration of births, deaths, and diseases is regulated by the public statutes. The city physician must report to the board all diseases of a contagious nature. No information in regard to reports of the board could be obtained. The city physician makes an annual report, but does not touch upon sanitary matters.

MUNICIPAL CLEANSING.

Street-cleaning is done by the city with its regular force, and wholly by hand work. The paved streets are cleaned once a month, the others as needed. The work is thoroughly done, and the cost does not exceed $500 annually. The sweepings are either sold as manure or used for filling. The system is regarded as working well.

Removal of garbage and ashes.—Such garbage as can be used as swill is collected by swill venders; the balance and the ashes are collected by the city with its own force. No special rules as to the keeping or removal of garbage seem to exist, except that it must not be thrown into the streets or become a nuisance. Such garbage as is not taken for swill is taken outside the city, while ashes are used for filling on the roads. Garbage and ashes must be kept in separate vessels. The cost of this work to the city is $300, and no injury to the public health is reported. The system is satisfactory.

Dead animals.—Dead horses are removed and buried by their owners. Dead dogs and cats are occasionally reported to the board of health as remaining unburied, in which case the city force removes them. The annual cost is small. Fitchburg is satisfied with the system.

Liquid household wastes.—In those parts of the city where sewers exist the liquid wastes are run into them. Where there are no sewers some of the wastes pass into the gutters, but the larger part is run into cesspools or privy-vaults. These cesspools are usually tight, are not provided with overflows, and in some cases receive the wastes from water-closets; they are cleaned at night. Street-gutters are flushed by the hydrants on the water-mains, except in the portion of the city unprovided with water. There seems to have been no record of contamination of drinking-water from the overflows or underground escape of the contents of cesspools or privy-vaults, and no complaint against the system is made.

Human excreta.—About one-half the houses in the city are provided with water-closets, and of these 50 per cent. deliver into public sewers, the rest into cesspools and vaults. The other half of the houses depend on privy-vaults, which must be water-tight and sufficiently large. The ordinances provide that no night-soil shall be taken through the city between 4 a. m. and 10 p. m., but make no other rules as to cleaning. The dry-earth system is used extensively on the back and sparsely-settled streets. The night-soil is taken outside the city and used as manure, but none is allowed on the gathering-ground of the water-supply.

Manufacturing wastes.—There are no special rules as to disposal of liquid and solid manufacturing wastes, but as nine-tenths of the factories are on the Nashua river, nearly all discharge their wastes into it.

POLICE.

The police force is appointed by the mayor and aldermen, who exercise a general supervision of it. The chief of police is the executive officer, and has entire control of the department, under the direction of the mayor and aldermen; his salary is $1,200 a year. The force consists of 1 captain, at $2 44 a day; 8 day patrolmen, at $2 33 a day each; and 1 night patrolman, at $2 19 a night. The uniform is of dark-blue cloth, with police buttons, a black hat, and blue-cloth cap. They are made in a uniform style, and must be worn at all times, except by permission of the chief. The men provide their own uniforms, each costing, complete, about $75. They are equipped with a revolver and a club, and when on duty must wear the police badge on the left breast outside the outer garment. The patrolmen are on duty nine hours. During the year 458 arrests were made, the principal causes being drunkenness, larceny, vagrancy, and assault and battery. The number of station-house lodgers was 168, against 323 in 1879. Free meals to the value of $10 were given. The police force co-operates with the fire department and with the health department. No special policemen are employed. The total cost of the force in 1880 was $7,863 74.

FIRE DEPARTMENT.

The force consists of 1 chief and 4 assistant engineers, 1 superintendent of the fire-alarm telegraph, 3 members of steam fire-engine companies, 15 hook-and-ladder men, 54 hose-men, and 3 drivers—a total force of 81 men. The apparatus consists of 3 steamers, 2 two-horse hose-carriages, 2 one-horse hose-carriages, 2 hook-and-ladder trucks, and 3 two-wheeled hose-tenders. There are 6 horses and 8,100 feet of hose in use. Much of the hose is old, and more or less is condemned each year. The fire-alarm telegraph has 26 signal-boxes. During the past year 29 alarms were rung. The total loss was $9,178; insurance paid, $7,420, and the amount of insurance on property burned was $131,700. The total expense for the department was $8,240 20. The chief and assistant engineers are appointed annually by the city council, and together form the board of engineers; the chief is chairman, and there is an assistant secretary. The board is held responsible for the efficiency of the men, the care of all apparatus and other property of the department, and the condition of hydrants and reservoirs. The chief, or, in his absence, the assistant engineer next in rank, has command at all fires. The members of the force are appointed annually by the mayor and aldermen.

PUBLIC SCHOOLS.

There are 17 buildings used in whole or in part for school purposes. The total number of schools is 38, divided as follows: 1 high, 3 grammar, 7 intermediate, 9 secondary, 10 primary, and 8 ungraded. There are also 3 evening schools.

The following table gives the membership and average attendance in the schools:

Schools.	Number of pupils belonging.	Average daily attendance.	Per cent. of attendance.
All schools	*a* 2,069	1,820	87.9
High school	143	138	96.5
Grammar schools	512	466	91.0
Intermediate schools	295	266	90.0
Secondary schools	388	340	87.6
Primary schools	476	409	85.9
Ungraded	179	154	86.0
Evening drawing schools	37	28	75.7
Evening common schools	39	19	48.7

a The whole number of registered pupils is 2,701.

There are in all 64 teachers employed. The total expense of the day schools in 1880 was $35,042 92, or an average expense for each scholar of $19 78, based on the average daily attendance. The total expense of the evening schools was $491, or, based on the nightly attendance, $10 44 per scholar. The salary of the superintendent is $1,800 per annum, while the teachers receive from $1,500 to $350 a year.

GLOUCESTER,

ESSEX COUNTY, MASSACHUSETTS.

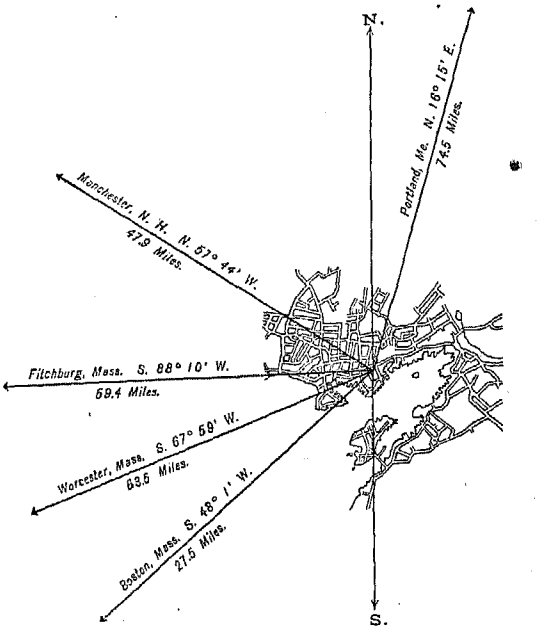
POPULATION

IN THE

AGGREGATE,

1800-1880.

	Inhab.
1790	
1800	5,313
1810	5,943
1820	6,384
1830	7,510
1840	6,350
1850	7,786
1860	10,904
1870	15,389
1880	19,329



POPULATION

BY

SEX, NATIVITY, AND RACE,

AT

CENSUS OF 1880.

Male	10,197
Female	9,132
Native	14,054
Foreign-born	5,275
White	19,309
Colored	20

Latitude: 42° 36′ North; Longitude: 70° 39′ (west from Greenwich); **Altitude: 0 to 255 feet.**

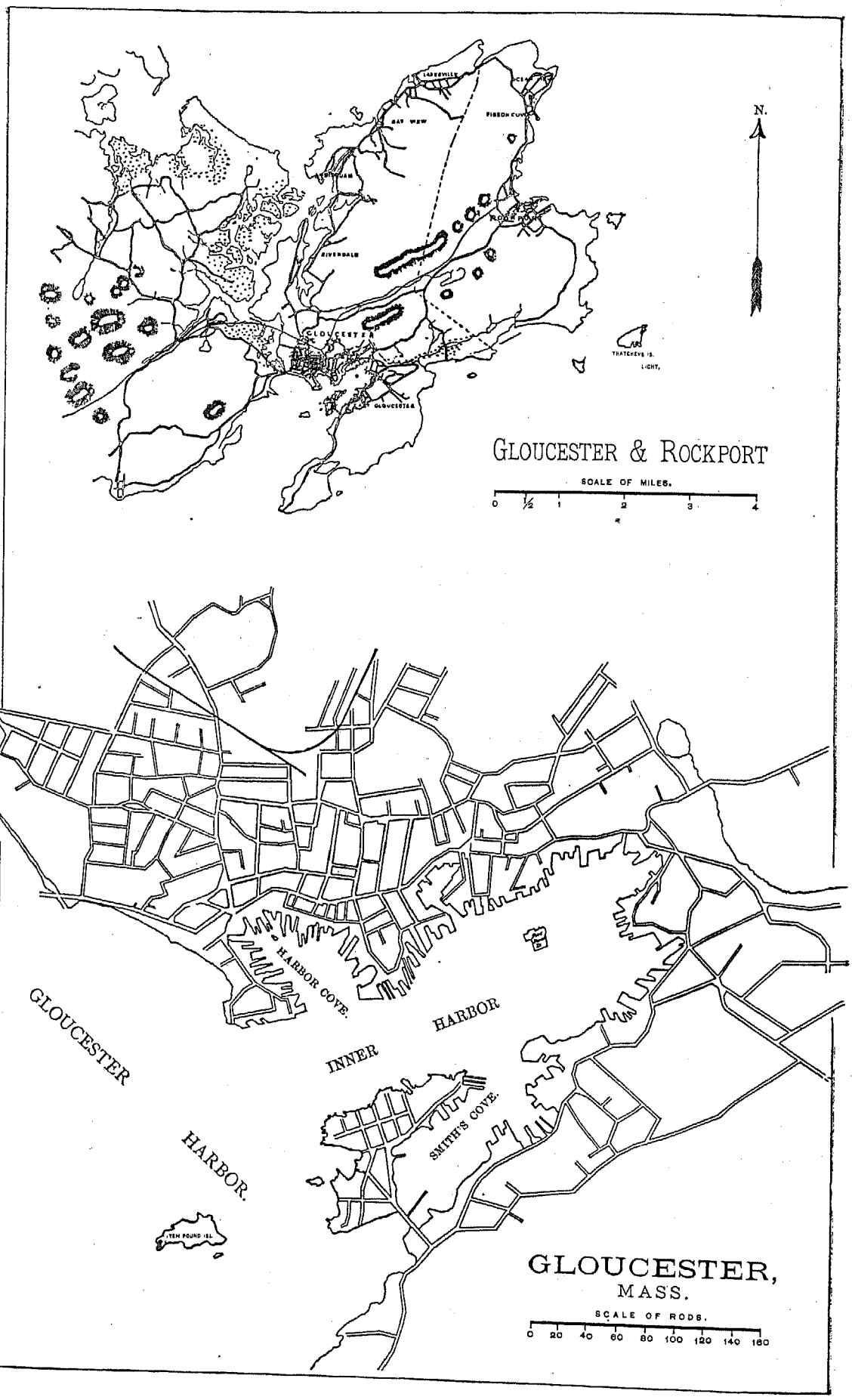
FINANCIAL CONDITION:

Total Valuation: $8,022,623; per capita: $416 00. Net Indebtedness: $193,370; per capita: $10 00. Tax per $100: $1 70.

HISTORICAL SKETCH.(a)

Gloucester was settled in 1623 by English families from the Plymouth colony, and was incorporated as a town in the year 1642. The inhabitants first tried agriculture and fishing combined, but as both these employments required attention at the same season of the year, they gradually abandoned the former and devoted their energies exclusively to the latter. Several large fires have occurred in past years; the first one was on September 16, 1830, the loss being some $150,000, on which there was no insurance; another occurred on February 18, 1864, the loss being $500,000, on which there was an insurance of $180,000. From both of these fires the citizens rapidly recovered and made many local improvements.

a No history could be obtained. The following was furnished by Messrs. H. F. Sanford and George H. Procter.


N.
GLOUCESTER & ROCKPORT
SCALE OF MILES.
0 ½ 1 2 3 4
HARBOR COVE.
GLOUCESTER
HARBOR
INNER
HARBOR
SMITH'S COVE.
GLOUCESTER,
MASS.
SCALE OF RODS.
0 20 40 60 80 100 120 140 160

Probably the greatest calamities that have visited Gloucester are those coming from losses in the fishing fleet. From 1830, when the fishing from the Georges' banks began, there has been a total of 412 vessels lost, valued at $1,711,399, and during the same time 2,173 men engaged in the fisheries lost their lives. As these vessels were all insured in home offices their loss fell directly on the community. Local organizations take care of the widows and orphans and see that they do not come to want. The years that experienced the heaviest losses were as follows: 1864, when 50 vessels and 120 men; 1871, when 19 vessels and 140 men; 1873, when 32 vessels and 174 men; and 1879, when 30 vessels and 266 men went down at sea. The money value of the vessels lost in the two years last named was $128,281 and $118,789, respectively.

As stated above, the first settlers were English, and their descendants have always been predominant. From the first the fisheries were conducted by this class, but in the last twenty-five years they have been supplanted by men who came from the British provinces, also by natives of the Western islands, Swedes, and Norwegians, who now form a large majority of those engaged in this industry. The fitting out of the vessels, however, as well as the curing of the fish, is still done by the native citizens. Gloucester received a city charter in 1873, and since that time has been under a municipal form of government.

GLOUCESTER IN 1880.

The following statistical accounts, collected by the Census Office, indicate the present condition of Gloucester:

LOCATION.

Gloucester lies in latitude 42° 36′ north, longitude 70° 39′ west from Greenwich, on the south side of cape Ann. The average altitude above sea-level is 100 feet, the lowest being tide-water and the highest Thompson's mountain, in the 8th ward—outside of the city proper—255 feet above tide-water.

HARBOR.

The harbor is safe and easy of access. It has an average width of three-quarters of a mile, being 1½ mile in its widest part, is 2½ miles long, opening in a southwesterly direction, and has a depth of from 3 to 9 fathoms. The ebb and flow of the tide is 10 feet, and the harbor is well protected from dangerous winds.

RAILROAD COMMUNICATIONS.

Gloucester is on the Gloucester branch of the Eastern railroad, between Boston and Portland, which extends from Beverly, on the main line, to Rockport, 4 miles east of Gloucester, a distance of 17 miles. There are six passenger trains daily to and from Boston, giving the city ample means of communication by rail with all points north, south, and west.

TRIBUTARY COUNTRY.

The country immediately west of Gloucester is a fair farming one, and most of its products find a market in the city. There are extensive granite quarries in the northern part of the city, and the stone finds a ready sale in many parts of the country. The local business is, of course, the fisheries, but the trade with the surrounding country is more or less affected by the near proximity of Boston.

TOPOGRAPHY.

The land on which the principal part of the city is built rises up from the water in terraces, the first being 50 feet, the next 75 feet, and the third 125 feet above sea-level. The first two are already built on and the last is being rapidly improved. The soil is gravel interspersed with bowlders, and the underlying rock is granite, ranging from the surface to some 50 feet below. The city limits extend north to Annisquam harbor, the Annisquam river being connected by a canal with the waters of Gloucester harbor, and the city is thus divided into two nearly equal parts. Owing to the nature of the soil and the slope of the land the natural drainage is good. The country to the east is open, while on the west it is wooded. There are a few small ponds within the city limits.

CLIMATE.

Highest recorded summer temperature, 96°; lowest recorded winter temperature, −8°. The highest summer and lowest winter temperatures in average years could not be ascertained. The influence of the Atlantic ocean raises the temperature in winter and lowers it in summer. There are no marshes of sufficient size to influence the climate. The influence of the elevated lands is said to modify the extremes of temperature. The prevailing winds in winter are from the north and west, in summer from the south and west, and in the spring from the east.

STREETS.

Total length, 140 miles. None of the streets are paved, all being laid in gravel, the cost of which is not stated. About $10,500 is expended annually on highways for ordinary repairs and $5,500 for improvements. The sidewalks are mostly of gravel, except on Main street, where they are of brick. The gutters are laid in cobble-stones, an abundant supply of that material being found along the shores of the cape. The city has never set out any trees nor laid out any grass-plots in the streets. All this kind of work has been done by the abutters, and the little that has been done is along the sides of the streets. The repairs, etc., on streets have been done by day labor, no contract work having been given out. There are no horse-railroads in the city. There is one omnibus line from the city proper to East Gloucester—2 miles—with 3 vehicles, 10 horses, and giving employment to 4 men. The total number of passengers carried during the year is 40,000, and the rate of fare is 5 cents.

WATER-WORKS.

Gloucester has no system for a public water-supply at present, but the city council has received authority to contract with a corporation competent to build and maintain the necessary works for supplying the city with water for fire and all other public purposes.

GAS.

Gas is supplied by a private corporation. The daily average production is 14,000 cubic feet, and the charge per 1,000 feet is $3. The city pays $2 75 per thousand, and $15 a year for each street-lamp, exclusive of care and lighting, 55 in number. In addition there are 70 naphtha lamps and 22 kerosene-oil lamps, at an annual cost, including everything, of $18 each. The city expends some $3,000 annually for street-lighting.

PUBLIC BUILDINGS.

The city owns and occupies for municipal uses, wholly or in part, 1 city hall, containing all the city offices, 1 almshouse and hospital, 9 engine- and hose-houses, and 22 school-houses. The total estimated value of these is $264,450. The city hall is owned entirely by the city and is valued at $115,000; its cost was not stated.

PUBLIC PARKS AND PLEASURE-GROUNDS.

There are no public parks in the city, but there are five private groves that are used for picnics, pleasure-parties, etc., and are controlled by their respective owners. Their size was not given, nor was any record kept of the average attendance at each.

PLACES OF AMUSEMENT.

There are no theaters in Gloucester. The city hall, with a seating capacity of 1,500, is fitted up with a stage, scenery, etc., and is used by traveling companies. The rental is $50 a night, which includes a license. There are also the Cape Ann Scientific and Literary Society hall, seating 300; the Young Men's Christian Association hall, seating 200; Proctor's hall, seating 200; Rogers' hall, seating 300; Mechanics' hall, seating 250; Liberty hall, seating 100; and Independence hall, seating 300. There are no concert- or beer-gardens in the city.

DRAINAGE.

In reply to the schedule on sewers, Mayor Garland says:

> I am sorry to have no information to produce, for we as yet have no system of sewerage. That matter, however, in connection with the introduction of water, is under consideration.

CEMETERIES.

There are 20 cemeteries and burial-grounds in the city, but neither their size nor location was stated. *Oak Grove Cemetery*, owned by a private corporation, is the largest; *Oak Hill Cemetery* is the next in size, and belongs to the Catholic church; and *Cherry Hill Cemetery* is owned and managed by the city. There are 3 burial-grounds no longer used; one in the 8th ward, on Thompson street; the old town burial-ground, in the 6th ward; and one on Church street belonging to the Universalist society. In 1880 there were 413 interments, of which all but 141 were in the 4 principal cemeteries, and since 1874 there have been 2,614 burials in all the cemeteries. Interments must be made on burial permits from the city clerk. The undertaker must return to the city clerk the name, age, sex, color, social condition, residence, occupation, cause and place of death, etc., of each person whose funeral he has charge of.

MARKETS.

There are no public or corporation markets in the city.

SANITARY AUTHORITY—BOARD OF HEALTH.

The chief sanitary authority of the city is vested in a sanitary committee with the powers and title of a board of health. It consists of the president of the board of aldermen, the president of the common council, the secretary of the overseers of the poor, the city physician, and one person appointed from the citizens at large. It derives its powers from the state laws and is appointed annually. Its expenses in 1880 were $781 14, incurred in abating nuisances and removing offal and rubbish. In case of an epidemic its expenses are not limited, as it has authority to provide for all necessary cases. In absence of an epidemic the board has the care of the sanitary condition of the city, and can make and enforce such regulations as it deems proper. The chief executive officer is the chairman, who serves without pay. The clerk and inspectors receive small salaries. The board meets on the second and fourth Mondays of each month. Two inspectors are employed, but they do not appear to have any police powers. The regulations of the board require that each house in the city shall have a good drain, and a suitable privy of sufficient size, constructed water-tight, at least 2 feet from all party lines, and the contents must not reach within 1 foot of the top of the ground. The board can require that any tenement not sufficiently supplied with drainage or privies, or inhabited by too many persons, shall be vacated until these faults are corrected. No dead animals, dirt, or rubbish is allowed to be thrown upon any public place or pond or into any dock, flats, or tide-water within the jurisdiction of the city. All filth deemed injurious to the public health by the board must be removed within a reasonable time. All privies must be cleaned between the 20th of November and the 20th of April, and between the hours of 10 p. m. and 5 a. m. All vessels entering Gloucester harbor from any sickly port are quarantined, and can leave the quarantine grounds only after an inspection by the city physician. Inspections of the city are made frequently, but most of the nuisances are reported. When a nuisance is found to exist it is ordered abated. There are no sewers in the city, and the streets are cleaned when necessary. The board controls the removal of garbage. The burial of the dead is governed by state laws, and the board has issued no special regulations in the matter. When fish refuse is used as manure, it must be covered with earth within twenty-four hours, so as to render it inoffensive.

INFECTIOUS DISEASES.

Small-pox patients are either quarantined at home, or sent to the pest-house which is on the city farm one-quarter of a mile from the almshouse. Scarlet-fever patients are isolated at home, only the physician and nurse being allowed in the sick-chamber. No teacher or scholar from any house where there is a contagious disease can attend the public or private schools in the city until four weeks after the beginning of the last case in said house, unless permission is given by the board. Vaccination is compulsory, and in case a person is unable to pay, it is done at the public expense. Physicians must report to the board all cases of contagious diseases under their charge, and the bodies of those dying of such diseases must be buried within twenty-four hours after death.

The registration of diseases, births, and deaths is made by the city clerk in accordance with the state laws.

REPORTS.

The board reports annually to the city council, and in future the report will be published with the city documents. During the past year an ordinance was passed, to take effect January 1, 1881, creating a board of health, to consist of three members—one of them to be the city physician, the other two not members of the city council—to be appointed by the mayor, subject to the approval of the board of aldermen.

MUNICIPAL CLEANSING.

Street-cleaning.—The streets are cleaned at the expense of the city and with its regular force. The work is done wholly by hand, no sweeping-machines being used. The cleaning is done when needed, and in most cases it is thorough. The annual cost is probably from $200 to $300. The sweepings are used for filling, and the system is reported as being satisfactory.

Removal of garbage and ashes.—This is done by the city with its own force. Householders are required to set both out in vessels convenient for removal, and the teams go around each day and collect them. Garbage must not be kept long enough to become a nuisance, and must be kept in a vessel separate from the ashes. No other regulations appear to exist. The garbage and ashes are removed to the city farm, and the annual cost to the city is about $300. No injury to health is reported to result from the system.

Dead animals.—The board of health removes all dead animals when notified, and has them buried on the city farm. Occasionally carcasses are towed out of the harbor, or, if they float ashore, are buried on the beach. During the past year fourteen carcasses, including four whales that drifted ashore, were so disposed of. The cost of this service is from $20 to $25 annually. The system is reported as working well, though sometimes people throw carcassas into the harbor, trusting to the tide to remove them, rather than pay for their burial.

Liquid household wastes.—As there are no sewers, liquid household wastes are thrown into cesspools or privy-vaults, none being allowed to run into the gutters. Most of the cesspools are porous; none have overflows, and

some receive the wastes from water-closets. They are cleaned out when full. Some of the wells and springs in the city are reported as having been polluted by the escape or overflow of the contents of cesspools and vaults, and the purest water in the city is said to be that from cisterns provided with gravel filters.

Human excreta.—Nearly all the houses depend on privy-vaults. There are only a few water-closets, all of which deliver into cesspools. Very few vaults are water-tight, though all are required to be so constructed. The dry-earth system is used only to a limited extent. The night-soil is deposited in basins or places prepared for it on the city or other farms beyond the city limits, and there left till cold weather, when it is composted with dry earth, loam, etc., and used as a fertilizer.

Manufacturing wastes.—Except the establishments for making fish-oil, there are but few manufactures in the city. The wastes from the oil factories are disposed of by running the liquids into the harbor and selling the solids for manure; the latter is sometimes very offensive when removed.

POLICE.

The police force is appointed by the mayor, subject to confirmation by the board of aldermen, and is governed by the city marshal. The city marshal is the chief executive officer, and is responsible for the discipline and efficiency of the force. He has entire control of the department, its officers, special officers, and constables when employed in the service of the city; his salary is $95 a month. The force consists of 1 captain of the night police, at $70 a month; 4 day and 6 night policemen, at $60 a month each; 1 janitor of police station, at $55 a month; and 3 special police officers, at $55, $30, and $25 a month, respectively. The uniform consists of a dark-blue cloth suit, with brass buttons having the letters "G. P." on them, a stiff round-topped black hat with embroidered wreath, a silver badge, and a belt and club. The total cost of the uniform is $98, and each man provides his own. In addition to the club each man carries a revolver, hand-cuffs, and whistle. The patrolmen are on duty eleven hours for day and ten for night service. One patrolman is on duty during the night in East Gloucester, one in Bay View, one in Lanesville, and one in West Gloucester. During the past year 679 arrests were made, the principal causes being drunkenness, assault, larceny, and keeping liquor-nuisances. These were mostly disposed of by fines. The total amount of property lost or stolen during the year and reported to the police was $1,678 71, and of this $838 26 was recovered and returned to the owners. The total number of station-house lodgers for the same time was 612, as against 756 for 1879. The force also suppressed 474 disturbances and investigated 1,083 cases and complaints. The police force is required to co-operate with all the other departments of the city needing its assistance. The annual cost of the force (1880) is $12,432 22.

FIRE DEPARTMENT.

The annual report of the chief engineer for 1880 shows that the apparatus of the department consists of 3 steam fire-engines, 5 hand-engines, 5 hose-carriages, 2 hook-and-ladder trucks, 1 supply-wagon, 1 chemical engine, and 3 chemical hand-extinguishers. There are 10,500 feet of hose, 4,350 feet being good and 6,150 feet is not to be depended on. There are 4 horses. The number of men in the force was not stated. During the year 26 alarms were answered by the department, and of these 3 were false alarms. The total value of property lost by fire during the year was $11,950, of which $7,920 was covered by insurance. The annual cost of the fire department (1880) is $13,807 94.

PUBLIC SCHOOLS.

There are 22 school-houses in Gloucester, containing 28 schools, as follows: 1 high, 7 grammar, 4 mixed, 1 training, and 15 primary. The total number of teachers is 84, including 1 for drawing, and the whole number of pupils that have been registered for one week or more is 4,126. Of these, 2,095 were boys and 2,031 were girls. The following table shows the attendance in the public schools during the past school-year:

Schools.	FALL TERM.				WINTER TERM.				SUMMER TERM.				YEAR.			
	Whole number registered.	Average weekly whole number.	Average weekly attendance.	Per cent. of attendance.	Whole number registered.	Average weekly whole number.	Average weekly attendance.	Per cent. of attendance.	Whole number registered.	Average weekly whole number.	Average weekly attendance.	Per cent. of attendance.	Whole number registered.	Average weekly whole number.	Average weekly attendance.	Per cent. of attendance.
All schools	3,768	3,385	3,188	94	3,560	3,258	2,974	91	3,538	3,266	3,087	94	3,622	3,303	3,083	93
High	163	157	155	98	157	148	140	95	141	138	135	98	154	148	143	96
Grammar	1,767	1,622	1,529	94	1,709	1,584	1,468	93	1,605	1,491	1,426	96	1,694	1,566	1,474	94
Mixed	195	158	146	92	164	140	125	89	170	138	124	90	176	145	132	91
Training	27	26	24	92	25	24	22	92	24	24	22	92	25	24	22	92
Primary	1,616	1,422	1,334	93	1,505	1,362	1,219	90	1,598	1,475	1,380	94	1,573	1,420	1,312	92

During the past year instruction in sewing was given in 10 of the schools to 376 pupils. In October arrangements were made to accommodate pupils in the carpentry class. The attendance was optional with the pupils, but 96, divided into 8 classes, attended. There were 2 full classes of girls and 1 class of girls and boys.

COMMERCE AND NAVIGATION.

[From the reports of the Bureau of Statistics for the fiscal years ending June 30.]

Customs district of Gloucester, Massachusetts.	1879.	1880.
Total value of imports	$58,253	$81,906
Total value of exports:		
Domestic	$88,574	$26,410
Foreign	$149	$288
Number of immigrants	23	322

Customs district of Gloucester, Massachusetts.	1879.		1880.	
	Number.	Tons.	Number.	Tons.
Vessels in foreign trade:				
Entered	96	15,899	121	21,173
Cleared	92	10,208	94	12,988
Vessels in coast trade and fisheries:				
Entered	37	3,413	29	3,046
Cleared	24	5,933	41	4,981
Vessels registered, enrolled, and licensed in district	492	28,534	476	28,194
Vessels built during the year	9	508	7	713

SEA-FISHERIES.

The following summary, from the report of G. Brown Goode, special agent, indicates the condition of the sea-fisheries in the customs district of Gloucester, Massachusetts, during the year 1879:

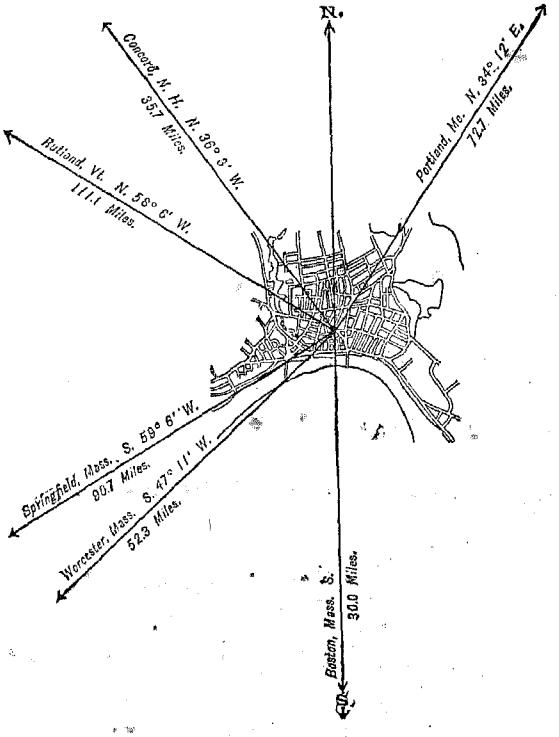
Total number of persons employed	6,206	Fresh fish ..... pounds..	184,470,526
Total amount of capital invested	$4,326,568	Dried, smoked, etc ..... do....	62,067,893
Total number of vessels engaged	434	Lobsters ..... do....	285,510
Total number of boats engaged	2,250	Clams ..... bushels..	23,659
Total number of nets in use	782	Total value of miscellaneous products	$184,300
Total number of traps in use	2,563		

HAVERHILL,

ESSEX COUNTY, MASSACHUSETTS.

POPULATION IN THE AGGREGATE, 1800–1880.

	Inhab.
1790	.....
1800	2,730
1810	2,682
1820	3,070
1830	3,896
1840	4,336
1850	5,877
1860	9,995
1870	13,092
1880	18,472



POPULATION BY SEX, NATIVITY, AND RACE, AT CENSUS OF 1880.

Male	8,848
Female	9,624
Native	15,364
Foreign-born	3,108
White	18,302
Colored	*170

* Including 3 Chinese.

Latitude: 42° 47′ North; Longitude: 71° 4′ (west from Greenwich); **Maximum altitude: 300 feet.**

FINANCIAL CONDITION:

Total Valuation: $9,201,013; per capita: $498 00. Net Indebtedness: $393,428; per capita: $21 30. Tax per $100: $1 72.

HISTORICAL SKETCH.

In 1640 the general court of Massachusetts granted the petition of "Mr. Ward and Newbury men" for a plantation on the Merrimack at Pentucket, and in October a party of settlers came from Ipswich and Newbury to make their homes on the plantation. The tract of land which they received included, besides the present city of Haverhill, part of the towns of Salem, Atkinson, Hampstead, and Plaistow, New Hampshire, and Methuen, Massachusetts. During the first few months the new plantation was called Pentucket; but the name was soon changed to Haverhill, in honor of the Rev. John Ward, one of the leading men and the first minister, who was a native of Haverhill, England. In 1645 it was regularly incorporated as a town, and maintained a town government until made a city in 1870.

None of the New England towns had a longer or more bitter experience with the Indians. During King Philip's war, 1675–'76, although not attacked, it was kept in continual alarm; but in the Indian troubles from 1688 to 1708 it suffered greatly from their depredations. The most memorable event in its early history is the capture and escape of Mrs. Hannah Dustin, who was taken prisoner in March, 1697, and carried to an island in the Merrimack, near Concord, New Hampshire. With the aid of her nurse and a boy, also held in captivity on the island, she killed her captors and, taking one of their canoes, made her way in safety to Haverhill, after an absence of little more than a month. The French in Canada instigated these attacks, and August 29, 1708, a party of French and Indians, after passing the outlying garrisons without being discovered, made a sudden attack upon the unsuspecting town. Roused from sleep by the yells of the Indians, the citizens made a brave defense, but did not succeed in driving back the enemy until 16 persons had been killed, nearly 40 taken captive, and several houses burned. This was the last and the most serious of the Indian attacks, and with the close of the war the people of Haverhill entered upon a period of slow but steady progress.

The territory of the town was greatly diminished by the incorporation of a portion as the town of Methuen in 1725, and still further lessened by the decision of King George in 1741 establishing the boundary between New Hampshire and Massachusetts. By this decision Haverhill lost fully one-third of her remaining territory, and the disputes arising as to the ownership of the land thus given to New Hampshire were not settled for many years, in spite of the declaration of the king that his decision as to the jurisdiction of the two provinces should not affect private property.

Situated at the head of tide-water on the Merrimack, Haverhill became one of the most important inland commercial towns of the state. The inhabitants were zealous opponents to the British policy of oppression previous to the Revolution, and steady and determined friends to the patriot cause during the dark years of the war.

With the close of the war the ship-building and commerce of the town, which had been almost ruined, gradually revived. Washington visited the town in 1789, and reports of it that "Haverhill is the pleasantest village I have passed through".

In 1794 the Haverhill bridge was built across the Merrimack. This bridge had three arches of 180 feet span, each resting on solid piers of masonry 40 feet square. Over the channel was a draw 30 feet in width. The September preceding, the *Guardian of Freedom*, the first newspaper in Haverhill, made its appearance. The town was now on the high road to prosperity. In 1798 a project was broached to supply the town with water from Round pond, and in 1801 permission was given to build an aqueduct for that purpose. The water was brought to the town through wooden pipes, which continued in use until replaced by iron pipes in 1848. In the same year measures were taken to prevent the destruction of fish, once a source of considerable wealth to the town. In 1804 the manufacture of cotton yarn was begun, and later in the same year a factory for making nails.

The embargo and non-intercourse acts again nearly ruined the commerce of Haverhill, yet during the war of 1812 the citizens, although opposed to the policy which caused the war, performed faithfully every duty laid upon them by the general government. The town recovered its prosperity, and from 1815 may be dated the rise of its most important industry—the manufacture of shoes.

The commercial history of Haverhill in the present century is the history of the manufacture of shoes and of hats. Probably the first shoemaker in the town was Andrew Greeley, who came thither in 1648; but shoemaking in his days, and for the following one hundred and fifty years, was nothing like the industry of to-day. The shoemaker went from house to house, after stopping long enough at one to make a whole year's supply of shoes for the family, and in many cases the farmer did his own cobbling. As late as 1794 there were said to be but two cobblers in Haverhill. With the next year came the first attempt at a wholesale business, and from this time the industry grew rapidly. In 1812 a wagon-load of shoes was sent to Philadelphia, and the venture turned out well. Three years later large numbers of shoes were sent to Danvers, Massachusetts, in exchange for leather, and from that place were shipped to various parts of the South. In 1817 it was estimated there were 200 shoemakers in the town, and in 1818 a former citizen of Haverhill established an agency in New York for the sale of the shoes made in his former house. Once firmly established, the business grew rapidly. In 1818 a regular two-horse baggage-wagon began to run between Boston and Haverhill to accommodate the shoe manufacturers, and previous to 1837, when the branch of the Boston and Lowell railroad from Wilmington to Andover was extended to Bradford, just across the Merrimack from Haverhill, these baggage-wagons carried nearly 6,000 tons of shoes to Boston. The panic of 1837 seriously affected Haverhill, and it was not until the discovery of gold in California, and the rapid settlement of the West opened new markets for her products, that her prosperity returned. In 1857 there were 90 and in 1860 there were 98 shoe manufacturers in the town. The panic of 1857 and the beginning of the war again brought a period of great loss and anxiety to the manufacturers, but during the war they recovered, and in 1880 the business had reached very large proportions.

The manufacture of hats has been another source of wealth to the town. The first hatter of whom any record exists was Jonathan Webster, in 1747, and previous to 1800 several hatters did business in Haverhill, but by 1805 all had given up. The manufacture was revived in 1815, and grew rapidly until, in 1835, one hatter made from forty to fifty dozen hats a day. The hat of those days was of beaver-fur, and the dress-hat or "beaver" was a ponderous and expensive structure calculated to last a man his lifetime. These hats have been replaced by the

silk hat for dress occasions, and the various styles of stiff and soft felt hats for general wear. The changes in style have necessitated many changes and improvements in the machinery, but Haverhill manufacturers have kept pace with all changes.

In 1869 the population had increased to 12,100, and the town form of government being too cumbrous, Haverhill was granted a city charter, which was accepted in the following year. Her progress since becoming a city has been steady, and the account of "Haverhill in 1880", which follows, shows the condition of the city to-day.

HAVERHILL IN 1880.

The following statistical accounts, collected by the Census Office, indicate the present condition of Haverhill:

LOCATION.

Haverhill lies in latitude 42° 47′ north, longitude 71° 4′ west from Greenwich, on the left bank of the Merrimack river, at the head of tide-water, 18 miles from its mouth, and opposite the towns of Bradford and Groveland, with which it is connected by an iron bridge. Neither the average altitude nor the lowest point above sea-level was given. The highest point is 300 feet above sea-level. The river has a width of 600 feet and a depth of 8 feet, the latter being in the channel at high water. Water communication is open to coasting vessels of 200 tons, to Maine for pine and lumber, to Rockport for granite, to Boston for merchandise, and to Philadelphia for coal. Vessels are towed by steam-power up from Newburyport. Small pleasure steamers ply between the city, Newburyport, and the adjacent beaches; small steamers of light draught have ascended the river as far as Lawrence. The United States government has opened a narrow channel in the rocky bed of the rapids, and with further improvement navigation to Lawrence will be practicable. The rapids at the city extend up about a mile, and have a fall of 9 feet in this distance; they are in two sections.

RAILROAD COMMUNICATION.

Haverhill is on the Boston and Maine railroad, termini Boston and Portland, and is 33 miles from the former and 83 miles from the latter, by rail. A branch of the same road connects the city with Georgetown and Newburyport.

TRIBUTARY COUNTRY.

The country immediately tributary to Haverhill, excepting the small villages of Ayer and Rocks, is agricultural, there being many farms in the suburbs that supply the city with fruit and vegetables. Apart from the manufacturing interests, Haverhill has a considerable local trade with the many towns surrounding and adjoining her limits, as well as with the villages in New Hampshire near the state line.

TOPOGRAPHY.

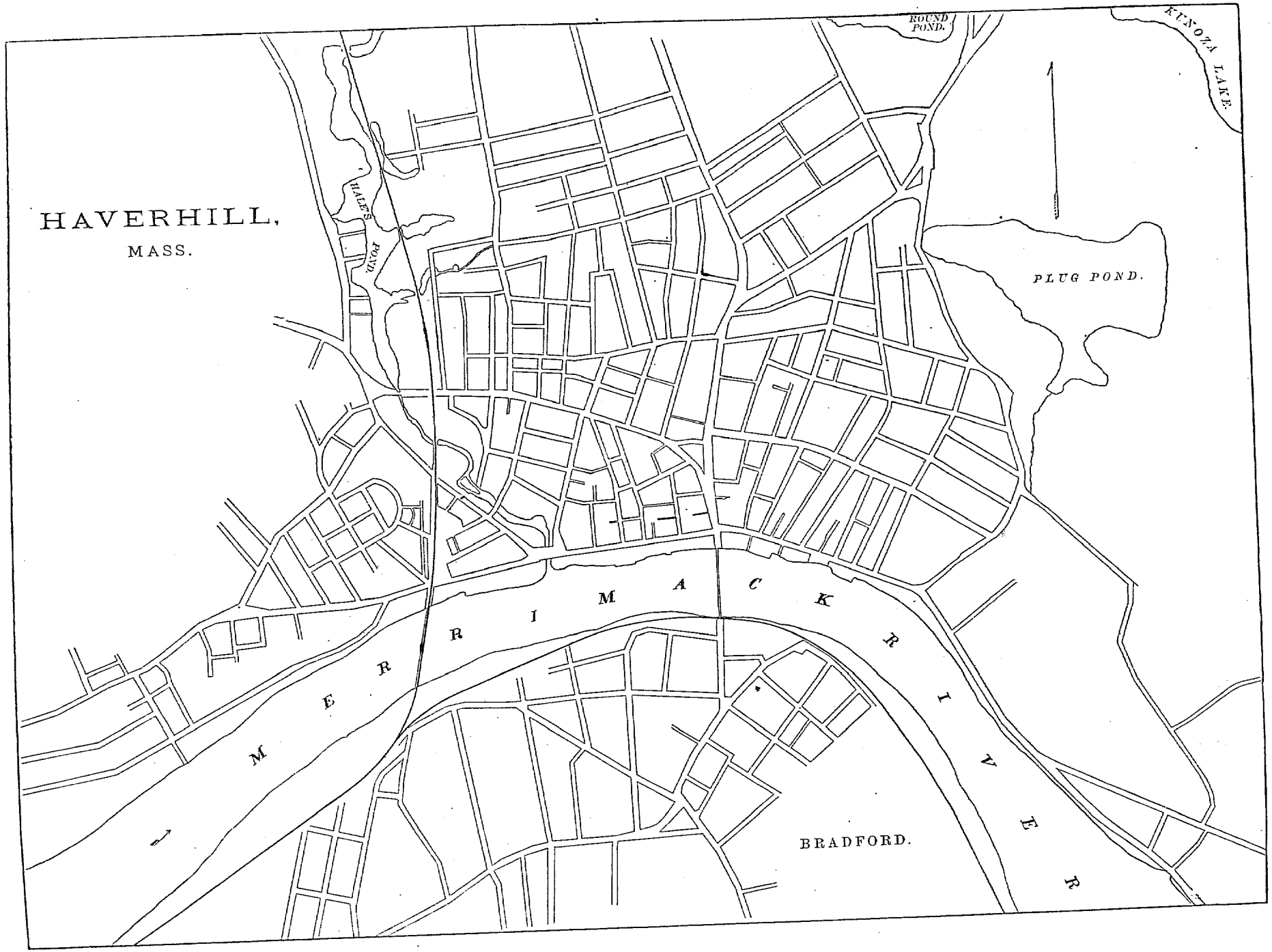
Haverhill extends 9 miles along the north bank of the Merrimack river; the average width is 3 miles, and there are 15,200 acres contained within the limits, 1,107 acres being covered with water. The soil consists of a light loam, gravel, and clay, with granite and common rock in considerable abundance. The clay is very abundant, is found a few feet below the surface, and, owing to its retention of moisture, renders the soil damp and heavy; with drainage and cultivation the soil is made productive, particularly for potatoes and other vegetables. The city proper slopes abruptly toward the river, and the natural drainage is good. The balance of the territory is undulating, with several hills rising here and there, but not connected; is divided by several streams that empty into the river, and has four ponds, with intervening marshes. Three of these ponds furnish the water-supply of the city, and the country is only sparsely wooded.

CLIMATE.

Highest recorded summer temperature, 100°; highest summer temperature in average years, 95°. Lowest recorded winter temperature, −20°; lowest winter temperature in average years, −10°. Fogs roll up the river during the spring and fall, causing dampness and some sickness, but no malaria. The marshes are not large enough to have any perceptible influence on the climate, while the elevated lands are considered healthful; the east winds from the ocean, only 18 miles distant, are cold and damp, while the west winds are dry and genial.

STREETS.

Total length, including roads, 100 miles. These are paved as follows: Stone blocks, 2.27; asphalt, 0.13; broken stone, 0.38 miles. It was not stated in what way the balance of the streets, 97.22 miles, were finished. The cost of paving with stone blocks, including grading, is given at $2 50 per square yard, but this is only an estimate, as no


HAVERHILL,
MASS.
HALE'S POND.
ROUND POND.
KENOZA LAKE.
PLUG POND.
MERRIMACK RIVER
BRADFORD.

separate accounts are kept. The block pavement is preferred, both for quality and for economy. There are 4½ miles of brick, 4 miles of concrete, and 3 miles of plank sidewalks. There are about 3 miles of gutters paved with cobble-stones, no other material being used for this purpose. Trees at the present time are set out by the abutters, after which they become the property of the city. The general repair of streets is done by the day, at an annual expense of $25,000. In furnishing the information regarding streets, Mayor Shapleigh says:

For the most part of our repairs it is better to have it done by the day, for this reason: We have a certain number of men that work by the year (rain or shine), who have a certain number of streets to look after in time of storms, keeping the gutters and traps clear and in order. The teams belonging to the steamers of the fire department are used on the streets and do most of the work required in the city proper, their services being charged to the street department, with credit of same to fire department, the expense to the city being the same whether at work or not. The new paving of streets is done by the yard, the city doing the grading by the day. Edge-stones for sidewalks set by the linear foot; sidewalks, brick or concrete, done by contract; also the sewers are done by contract, including digging and back-filling. All the foregoing work is done under the supervision of an engineer and superintendent of streets. Results of contract work, 25 to 30 per cent. saved.

There is one street-railroad extending to Groveland, on the other side of the river, with 3.28 miles of track, 5 cars, 14 horses, and employing 6 men. During the past year 149,272 passengers were carried, the rates of fare not being given. There are no omnibus lines in the city.

WATER-WORKS.

The water-works are owned by a private corporation, and their first cost was $350,000. Water is taken from Saltonstall and Pentucket lakes and pumped into a wrought-iron distributing reservoir 40 feet high and 30 feet in diameter, with a stand-pipe in the center 50 feet high and 24 inches in diameter; average available head, 150 feet. The estimated daily consumption is 100 gallons per head of the population. There are 25 miles of distributing mains and about 2,000 taps. The city pays $1,300 annually for water for all purposes, including 61 hydrants, 13 reservoirs, drinking-fountains, watering-troughs, etc.

GAS.

Gas is furnished by a private company; the average daily production is 30,000 cubic feet. The charge to consumers is $2 50 per thousand, net. The city pays 6½ cents a night for each street-lamp, 140 in number.

PUBLIC BUILDINGS.

The city owns and occupies for municipal uses, wholly or in part, 1 city hall, 1 city farm, 29 school-houses, and 6 engine- and hose-houses, the total value, as per the auditor's report for 1880, being $324,378. The city hall is owned entirely by the city, and cost $80,000.

PUBLIC PARKS AND PLEASURE-GROUNDS.

There are only two small "breathing-places" in the city, hardly worthy of the name of parks, the land of which was donated to the city. There does not appear to be any annual appropriation made for care or maintenance, nor is any record kept of visitors, etc.

PLACES OF AMUSEMENT.

There are no theaters in the city. City hall, with a seating capacity of 1,100, Music hall, with a seating capacity of 400, and Tilton's hall, with a seating capacity of 250, are used for traveling shows, concerts, lectures, etc. It does not appear that the halls pay any license to the city or that any revenue accrues from shows, etc.

DRAINAGE.

No regular system of sewerage was adopted until 1877. Works built previously to that date were put in without much system further than to relieve the streets from storm-water in time of heavy rain, and to drain some cellars along their line. After the introduction of a public water-supply and the general use of water-closets it was found that some of these old works would have to be relaid at a greater depth. Sewerage works now being constructed are being laid according to a regular system, discharging into the Merrimack river. The mouths of outfalls are fully exposed at low water. There is no provision for ventilation, except by means of catch-basins for rain-water, which are not trapped. Most sewers are reported to be self-cleaning. The only deposits removed consist of sand and gravel washed in from the streets. Some small laterals, laid on slight grades, have to be flushed occasionally in addition to the wash of storm-water. There is no record of the cost of such works. Hollow invert blocks for subsoil drainage have not been used. The city ordinances require assessments for the cost of sewers to be laid upon the owners of adjacent property according to the judgment of the mayor and aldermen. The usual practice has been to estimate the cost at $1 50 per foot, and to assess two-thirds upon the abutters at the rate of 50 cents per foot front on each side, not exceeding 125 feet in depth. Property more remote draining to the sewer is charged 25 cents per 100 square feet. The actual cost of sewers varies considerably according to the nature of the

ground, which in some places is of a loose, gravelly nature, liable to cave, and sometimes is saturated with water. The average cost of sewers of ordinary size and depth is estimated at $1 50 per foot, including manholes and catch-basins. Manholes are estimated at from $40 to $60 each, brick-work laid in cement, at $13 per 1,000.

CEMETERIES.

Haverhill has 11 cemeteries. Among these are *Pentucket Cemetery*, the oldest, with an area of 2½ acres; *Linwood Cemetery*, 12 acres; *Hilldale Cemetery*, 15 acres; *Catholic Cemetery*, 8 acres; and a public burial-ground of 3 acres. The consent of the board of health must be obtained for a burial in Pentucket cemetery. Permits for interments are granted by the city clerk on certificates of the attending physician, approved by the board of health, and all graves must be 3½ feet to the top of the coffin. Linwood and Hilldale cemeteries are managed by corporations. Since 1868 burials in Pentucket cemetery have been prohibited, except in special cases.

MARKETS.

There are no public or corporation markets in the city.

SANITARY AUTHORITY—BOARD OF HEALTH.

The chief sanitary authority of Haverhill is in the hands of the board of health, consisting of three members, of whom two are physicians. The board was created in February, 1880, and no regular appropriation for its maintenance has yet been made. The expense for the past year was $283 80 for printing, advertising, labor, etc. In case of an epidemic the board can increase its expense to any amount. In absence of an epidemic its authority is about absolute under the laws of the state. During an epidemic its authority is absolute so far as arresting the spread of the disease is concerned. An agent is employed, who has power to serve warrants and prosecute offenders. In some sections of the city inspections are made regularly, but in general nuisances are inspected only when reported to the board. When a nuisance is reported it is first inspected by the agent, who serves a written notice on the owner to abate it. After five days another inspection is made by the agent, and if the notice has been disregarded, the board makes an inspection, adjudges it a public nuisance, and legal measures are taken against the owner. The board is appointed annually by the mayor, with the approval of the aldermen. The city council controls only the salaries of the members and employés. The board meets every Friday. It has the oversight of all defective house-drainage, privy-vaults, cesspools, sources of drinking-water, etc. When any defect is reported or suspected a member of the board makes a personal inspection. It recommends the construction of sewers. A dry-dirt cart is sent around to collect all sweepings, and the street commissioner keeps the streets free from filth. All garbage is removed by contractors licensed by the board. It has control of all interments, and no burial can be made without its indorsement on the undertaker's return. It attends to the cleaning of all streets and the removal of excrement. No one is allowed to cast any filth or dead animal into any waters within the city limits.

INFECTIOUS DISEASES.

Small-pox patients are either quarantined at home, or removed to the pest-house situated on the Merrimack, some miles from the city proper. Scarlet-fever cases do not appear to be isolated. The board can close the schools, enforce vaccination, and compel non-attendance from families where contagious diseases exist. Vaccination is compulsory, and in times of epidemic is done at public expense. The registration of diseases, births, and deaths is done by the city clerk in accordance with the state laws. Physicians must report all contagious diseases to the board.

REPORTS.

The board must report annually to the city council; whether this report is published or not is not stated.

MUNICIPAL CLEANSING.

Street-cleaning is done by the city with its own force, and wholly by hand labor. The paved streets are cleaned once a month, the unpaved in the city proper twice a year. Most of the sweepings are taken to the city farm and used as a fertilizer.

Removal of garbage and ashes.—These are removed by parties licensed by the board of health, without expense to the city or householders. Garbage and ashes must be kept in separate vessels, but no other regulations exist. The garbage is used as food for swine outside the city, while the ashes are removed by the city teams and used for repairing roads. No separate account of the cost is kept. No nuisance or probable injury to health is reported as resulting from the system.

Dead animals must be removed by the owner and buried. No place seems to be indicated for the purpose, but they must not be thrown into any stream within the city limits. During 1880, $12 was expended for "burying dead animals", seeming to show that the city performs the work where no owner can be found.

Liquid household wastes.—About one-half the household wastes in the city proper run into the sewers, the rest into vaults and cesspools. The latter are porous, unprovided with overflows, do not receive the wastes from water-closets, and are unregulated as to construction or cleaning.

Human excreta.—Not more than 15 per cent. of the houses are provided with water-closets, all of which deliver into the sewers; the balance depend on privy-vaults. They are required to be made water-tight (though not more than 4 per cent. of them are so), of a size sufficient for the needs of the house, and the contents must not be allowed to come within 18 inches of the surface of the ground. The cleaning out can be done only by persons licensed by the board of health, which removes the contents in water-tight carts, wagons, or boxes. The night-soil is taken to the city farm and used as manure, none of it being allowed on land within the gathering-ground of the water-supply.

Manufacturing wastes.—There are no regulations regarding the disposal of either liquid or solid manufacturing wastes. Nearly all the manufacturing of the city is connected with the shoe industry, and the solid wastes from this are used as fuel.

POLICE.

The police force is appointed by the mayor, with the confirmation of the aldermen, and is governed by the committee on police. The city marshal is the chief executive officer, has charge of the force, prosecutes offenders, enforces the city ordinances, and, with the mayor, aldermen, and committee, governs the police. He receives $1,000 per annum. The force consists of 1 assistant marshal, 1 captain of the watch, 2 day officers, and 10 night watchmen. The pay is $2 12½ each per day. The uniform is of blue cloth with brass buttons, and costs $50, each man paying for his own. Each man is equipped with a billy, a pair of handcuffs, a pistol, and twisters. The hours of duty are from 7 a. m. to 6 p. m., and from 9 p. m. to 4.30 a. m., and 25 miles of streets are patrolled. During 1880 the police made 617 arrests, the principal causes being drunkenness, gambling, larceny, and assault. The total amount of property lost or stolen and reported to the police was $3,000, of which $1,904 was recovered and returned to the owners. The number of station-house lodgers was 400, against 706 in 1879. Free meals are given at a cost of 15 cents for each lodger. The police must co-operate with the fire department. Special police are appointed and governed like the regular force, and receive the same pay for the time on duty. The total cost of the department in 1880 was $10,724 20.

HOLYOKE.

HAMPDEN COUNTY, MASSACHUSETTS.

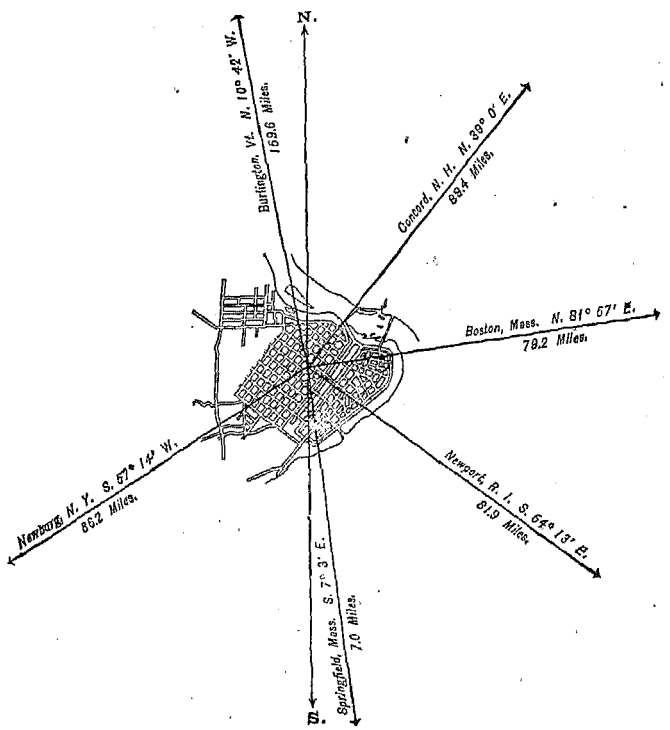
POPULATION

IN THE

AGGREGATE,

1850-1880.

	Inhab.
1790	------
1800	------
1810	------
1820	------
1830	------
1840	------
1850	3,245
1860	4,997
1870	10,733
1880	21,915



POPULATION

BY

SEX, NATIVITY, AND RACE,

AT

CENSUS OF 1880.

Male	10,308
Female	11,607
Native	11,000
Foreign-born	10,915
White	21,880
Colored	*35

* Including 4 Chinese.

Latitude: 42° 12′ North; Longitude: 72° 36′ (west from Greenwich); **Altitude: 60 to 300 feet.**

FINANCIAL CONDITION:

Total Valuation: $9,931,791; per capita: $453 00. Net Indebtedness: $878,454; per capita: $40 08. Tax per $100: $1 58.

HISTORICAL SKETCH.

The present city of Holyoke was originally embraced within the boundaries of old Springfield, and, at a later date, within the limits of West Springfield. On July 7, 1786, the part of West Springfield now covered by Holyoke was incorporated as the "Third Parish", and was generally known as "Ireland" and "Ireland Parish", from the fact that several Irish families were the first settlers of the territory. There is no record of the date of their settlement. For the next sixty years there is little to record regarding Holyoke, and the place where the busy city now stands was a farming hamlet, sparsely settled and but little known.

The falls of the Connecticut at South Hadley wash Holyoke on their western side. Here for many years a cotton factory of comparatively small dimensions was furnished with power by the diversion of the waters of the

Connecticut into a canal, and while inferior water-powers all over New England were seized and improved, this fall of 60 feet in the largest of New England's rivers was neglected. This seeming neglect was not because the advantages of the "great falls" were not seen, but on account of the engineering difficulties in the way and of the vast capital required in utilizing them. In the summer of 1847 several gentlemen of Boston became interested in the matter, and finding, after careful gaugings, that the volume of water flowing in the river at low-water mark was 6,000 cubic feet per second—equivalent to 30,000 horse-power—they determined to get control of it. At the next session of the state legislature, 1848, they obtained an act of incorporation under the name of the "Hadley Falls Company", "for the purpose of constructing and maintaining a dam across the Connecticut river, and one or more locks and canals in connection with said dam, and of creating a water-power to be used by said corporation for manufacturing articles from cotton, wool, iron, wood, and other materials, and to be sold or leased to other parties and corporations, to be used for manufacturing or mechanical purposes, and also for the purposes of navigation". The capital stock of the corporation was fixed at $4,000,000, divided into 8,000 shares of $500 each, and authority was given the company to hold real estate not exceeding in value $500,000, exclusive of improvements. The new company bought the whole property and franchise of the "Proprietors of the locks and canals on Connecticut river", the fishing rights above, and 1,100 acres of land on the promontory described by the bend of the river opposite the lower terminus of the South Hadley canal.

The company at once began operations by throwing a dam across the river, which was completed the same year, but, owing either to faults in the plan or to faulty construction, it was swept away a few hours after the gates were first closed. As with costly experiments this failure showed the way to final success, the loss of its first dam showed the company the engineering difficulties in the way, and, profiting by it, work was at once begun on the second dam, which was finished the next year and which still stands. The construction of this dam is thus described:

> Its length is 1,017 feet—about one-fifth of a mile. At the ends are abutments of heavy masonry, the amount in both being nearly 13,000 perches. Between these abutments it is composed of heavy timbers, the smallest being 12 inches square, which are built up in such a way as to present on the upper side a surface of plank inclined at an angle of 21° 45′ to the water of the river. The timbers which cross the river transversely are supported by other timbers at right angles with them, which are arranged in 170 sections 6 feet apart. The ends of these timbers, parallel with the course of the river, are spiked to the solid rock at the bottom of the channel with 1¼-inch iron bolts, of which there are nearly 3,000. There are 4,000,000 feet of timber in the structure, all of which being under water is protected from decay. Gravel was filled in and well pounded down at the foot of the dam, which is still further protected by the addition of a mass of concrete. As the timber-work went up, the whole foundation, 90 feet in extent, and all the open spaces were packed solidly with stone to the height of 10 perpendicular feet. The planking of the upper portion of the dam was doubled to a thickness of 18 inches of solid timber, all treenailed, spiked, and strongly bound together. The rolling top or combing was then covered with sheets of boiler-plate placed side by side and extending the whole length of the dam. The graveling in the bed of the river begins 70 feet above the dam, and is continued over 30 feet or more of its sloping surface, which is 90 feet in length from the foot to the crest of the dam. During the construction of the dam the water was allowed to flow through gates in it, 16 by 18 feet, of which there were 46 in all when the work was finished. About 22 minutes before 1 o'clock in the afternoon of October 22, 1849, the engineer gave the signal and half of the gates were closed; another signal immediately followed and the alternate gates were closed; the river ceased its flow until its waters, gradually collecting, rose upon the face of the dam and finally fell in a broad sheet over its crest.

In 1868 the gradual wearing away of the rocky bed below the dam by the constant action of the falling sheet of water decided the Holyoke Water Power Company—which had succeeded the Hadley Falls Company—to begin the construction of the apron which now forms the front of the original work. The new portion was built into the old, so as to form one solid structure of wood and stone, and was completed in 1870, and cost $263,000.

The system of canals is laid out on a scale commensurate with the volume of water to be distributed, and fourteen gates—twelve being 15 by 9 feet and two 11 by 4½ feet—all worked by a water-wheel, admit the water into the head of the upper-level canal, which is here 140 feet wide and 22 feet deep. This canal extends eastward 1,000 feet, and then sweeps southward for more than a mile in a right line, supplying the upper tier of mills, the width gradually lessening at the rate of 1 foot in every 100. The second-level canal, beginning at its southerly end opposite the terminus of the grand reach of the upper level, extends northerly for a mile or more parallel with the first-described canal and 400 feet from it, this portion serving as a race-way for the upper level, and also as a canal for the supply of mills below; it then extends easterly and southerly for a mile and a quarter more, at a distance of about 400 feet from the river, this marginal portion affording mill-sites along its entire length, from which the water used passes directly into the river. For 2,000 feet this canal has a width of 140 feet, then gradually narrows to 100 feet, which is continued to either end, the average depth being 15 feet. As will be seen by the map, these two canals extend in broad parallel lines through the central portion of the city, and are spanned by numerous iron bridges.

The third-level canal, 100 feet wide and 10 feet deep, is also a marginal canal, with mill-sites along its entire length, beginning at the southerly end of the second level and extending 3,550 feet to the other terminus of the same canal, thus making a line of marginal canals around the whole water-front of the city. The mills on the upper level have a head and fall of 20 feet. The difference between the second and third levels is 12 feet, while that between the marginal canals and the river varies from 23 to 28 feet. The upper level canal throughout its entire length, and large portions of the others are walled with stone to 3 feet above the water-level. Three overfalls of cut

granite, with suitable waste-gates, allow the waters to pass directly from each canal to the next lower, independently of the supply derived from the mills above, and by constant watching a uniform level is maintained in all the canals at all times.

Like other commodities that are bought and sold, water-power in Holyoke has its own unit of measurement, called a "mill-power", which is thus defined in the deeds of the company:

> Each mill-power at the respective falls is declared to be the right, during sixteen hours in the day, to draw from the nearest canal or water-course of the grantors, and through the land to be granted, 38 cubic feet of water per second at the upper fall, * * * or a quantity inversely proportionate to the height at the other falls.

In round numbers, one mill-power is equivalent to 60 horse-power, and when any one purchases a mill-site the number of necessary mill-powers is conveyed to the occupant by a perpetual lease. In 1873 the annual rental of a mill-power was $300.

The building of the dam soon had an appreciable effect on Ireland parish, and in 1850 it was set off from West Springfield and incorporated as a town under the name of Holyoke. Capital came in, and mill after mill went up along the canals. The opening of the Connecticut Valley railroad also lent an impetus to the town, and soon side-tracks, leading direct to most of the mills, were joined to the main line, thus affording ample means for the delivery of the raw material and the carrying away of the fast-increasing products. Water was introduced, gas-works were established, and in 1873 a city charter was granted to Holyoke. The principal industries at that time were the manufacture of cotton fabrics (such as sheetings, lawns, prints, ginghams, etc.), woolen and worsted fabrics, silk, paper, tools, and machinery, iron and steel wire, lumber, sash and blinds, wood-pulp, files, cutlery, wood-screws, etc. A reference to the table of manufactures under the head of "Holyoke in 1880" (see page 226) will show the extent to which the water-power of the "great falls" has been utilized.

There has been no large fire of any importance in the city, with the exception of the burning of the French-Catholic church in 1875, when 70 lives were lost. In common with the rest of the country, Holyoke suffered in the panics of 1857 and 1873. The population is now nearly 50 per cent. foreign-born, the most prominent being the Irish, who lead in most affairs of the city government, etc.; the French Canadians come next, then Germans, Scotch, English, etc. These foreign-born residents form in a great degree the operative class.

HOLYOKE IN 1880.

The following statistical accounts, collected by the Census Office, indicate the present condition of Holyoke:

LOCATION.

Holyoke lies in latitude 42° 12′ north, longitude 72° 36′ west from Greenwich, on the right bank of the Connecticut river and 8 miles north of Springfield. The average altitude above sea-level is 100 feet, the lowest point being 60 feet and the highest 300 feet. The river here is not navigable, though by improvements and canals small boats can pass to Hartford, 34 miles distant, and from there to Long Island sound, 49 miles farther. The natural fall of the river at the city is 60 feet in three-quarters of a mile.

RAILROAD COMMUNICATIONS.

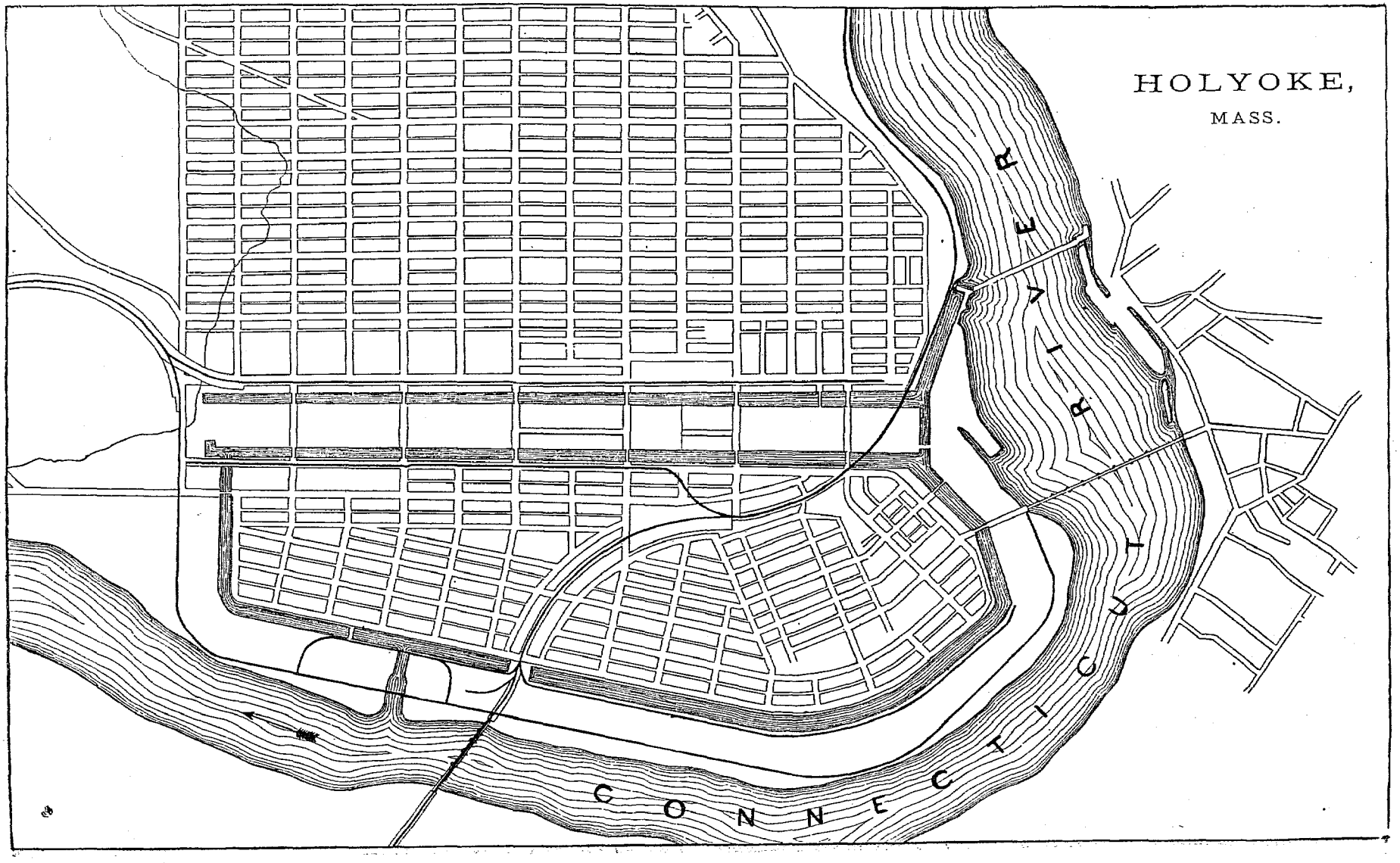
The Connecticut River railroad passes through the city, and gives direct communication with Montreal on the north and New York on the south, and, from Springfield, with Boston on the east and Albany on the west. A short branch connects Holyoke with the New Haven and Northampton railroad at Westfield.

TRIBUTARY COUNTRY.

The country immediately tributary to Holyoke is agricultural, dairy, and farm. Tobacco is largely grown, but the city itself, like the nearest towns, is strictly manufacturing, and the local trade is not important.

TOPOGRAPHY.

The city lies on the right (west) bank of the Connecticut river, just below the rift in the mountain-chain where the stream winds between mount Holyoke and mount Tom, as it leaves the more rugged regions of the upper valley. The site is on a small peninsula formed by a sweep of the river, and rises gradually from the shore, thus affording good natural drainage. The soil is a sandy loam and gravel that rests on layers of blue clay—with


HOLYOKE,
MASS.
CONNECTICUT RIVER

pockets of quicksand—and hard-pan. The underlying rock is a shaly stratified dark-brown stone that dips to the east with a pitch of about 2 feet in 12. Trap-rock, and a pudding-stone of light-brown color with pebbles and gravel intermixed, are abundant. The country is hilly, and within a radius of 3 miles there are several ponds of an area of some 200 acres. There are but few marshes.

CLIMATE.

Highest recorded summer temperature, 110°. Lowest recorded winter temperature, −15°. The highest summer and lowest winter temperatures in average years could not be ascertained. The marshes have no influence on the climate, so far as could be learned, although several cases of fever and ague are reported to have occurred near the water-works pond last year. The winds from the south and east are generally warm and rainy, while those from the north and west are cold. Mounts Holyoke and Tom act as storm-breaks for the north winds.

STREETS.

Total length of streets, 18 miles, and of this 500 feet is laid in broken stone and 14 miles in gravel. As the work has not been done with any system of specific record, no data could be obtained as to cost, etc. Most of the sidewalks are of brick; some, however, have been laid in asphaltum. These are said not to wear as long as the brick, and cost three times as much. Cobble-stone gutters are laid in all the streets that are curbed, and give good satisfaction. Trees are planted in rows on each side of the streets in grassed places between the curbstones and the sidewalks. Work of repairs of streets is done by the day, under supervision of the city, and costs on an average $2,000 annually. The total expenditures for highways, exclusive of sewers, for the past year is $21,446 24. Some work is done by contract, but day labor is preferred for all repairs. There are two omnibus lines in the city, with 3 vehicles, 5 horses, and 3 men; the fares are 5 cents each.

WATER-WORKS.

The water-works are owned by the city; their total cost was $303,000. The water is taken from two lakes with a flowage area of 211.8 acres, and an available gathering-ground of 1,726 acres, inside of the city limits and distant about 3½ miles from the city hall. The water is supplied by gravity. The carrying capacity of the main from the reservoir is 2,266,000 gallons daily, and the average pressure in the distributing mains is 74 pounds to the square inch, being 64 pounds at the city hall and 91 pounds on Main street. The yearly income from water-rates is $39,362 52, and the annual expenses, including maintenance, extension, repairs, meters, etc., are $17,212. At the close of the present year $10,500 was carried to the sinking fund. There are 24.73 miles of cast-iron mains, 107 gates, 149 public hydrants, and 59 meters. The average daily use of "metered" water during the year has been 154,656 gallons, and the total amount received from this source was $5,016 08.

GAS.

Gas is supplied by a private corporation, the daily average production of the works not being given. The charge to consumers per 1,000 feet is $2 50. The city pays 1⅛ cent per hour for each street-lamp, 100 in number.

PUBLIC BUILDINGS.

The city owns and occupies wholly for municipal uses one city hall, the total cost of which was $376,000. The number and cost of other buildings, such as engine-houses, school-houses, etc., is not given.

PUBLIC PARKS AND PLEASURE-GROUNDS.

Hampden Park, situated between Hampden, Dwight, Maple, and Chestnut streets, area 4 acres, is the only park in the city. It is grassed over, well filled with trees, and has walks leading to the soldiers' monument that stands in the center. The land was donated to the city, and the monument cost $10,000. The maintenance is confined to the cutting of grass and the trimming of trees. There are no special ordinances regarding the park, the superintendent of streets having a general supervision, and the police having a general oversight to prevent abuse, or occupancy after 10 p. m.

PLACES OF AMUSEMENT.

There is one theater in Holyoke, with a seating capacity of 1,080, which is used for exhibitions, etc. It pays no license or revenue to the city. There are also 3 halls, for concerts, lectures, etc., as follows: City hall, with a seating capacity of 1,146; Parsons' hall, with a seating capacity of 900; and Temperance hall, with a seating capacity of 365.

DRAINAGE.

The information concerning the sewerage of this city is meager. The work is evidently local and incomplete, there having been no regular plan adopted. No provision is made for ventilation. The outlets of the sewers are fully exposed, discharging into the Connecticut river.

It is stated that when catch-basins are properly constructed the sewers require little artificial removal of deposits, but some sewers have given trouble in such respects. For instance, the Front Street sewer, 2,800 feet in length, with an average height of 4 feet, has once been half filled with deposits, and was cleaned out at a cost of $1,000.

Two-thirds of the cost of the work is assessed, by area, upon the abutters, the remaining one-third being paid by the city.

The only statistics of cost given are as follows: Canal Street trunk sewer, 505 feet in length, with an average height of 4 feet, cost $1,278 for labor and material (double ring of brick). The excavating and refilling, done by the city, cost $2,000. The average cost of each inlet-basin and its connection was $80 44. Average cost of manholes of average depth, $35 each.

CEMETERIES.

There are 5 cemeteries in the city:

Forestdale Cemetery.—In the 7th ward, on Forestdale avenue, near Dwight street; area, 24½ acres.

Roman Catholic Cemetery.—Adjoining Forestdale; area, 12 acres.

The Baptist Village Cemetery.

The French-Catholic Cemetery.—Outside the city limits.

The Ireland Parish Cemetery.—In the 7th ward, on Ireland street.

Nothing further regarding the cemeteries of Holyoke was reported.

MARKETS.

There are no public or corporation markets in the city.

SANITARY AUTHORITY—BOARD OF HEALTH.

The chief sanitary authority of Holyoke is the board of health, an independent body composed of 3 members, one of whom is a physician. It is appointed annually by the mayor, subject to confirmation by the board of aldermen. It went into existence in June of the present year, previous to which the mayor and aldermen acted as a board of health. So far the expenses have been $350 for salaries, $20 for printing, etc., and $20 per month for collecting swill, house-offal, etc. During an epidemic the board can increase its expenses to an amount practically unlimited, as the city council would approve any expenditure it might make. In absence of an epidemic it has authority to suppress all nuisances, and during an epidemic it has authority to take such action as may be necessary to check and control the disease. The chairman presides at all meetings, the health officer attends to the outside business, and the secretary keeps the records and serves notices. No assistants are employed. The board meets weekly. It has issued regulations requiring that privy-vaults shall be made of brick or stone and cleaned at least twice a year (in October and April); that no drippings from the eaves or wastes from the kitchens or elsewhere shall be run into the vaults; that the vaults shall be cleaned only at night and their contents removed in tightly-closed carts; that house-drains must be covered and kept clean; that no offal, dead animals, or other filth shall be thrown into any streets, yards, alleys, or vacant lots in the city; that no business detrimental to the public health shall be carried on in the city; that all tenements shall be kept cleaned and not be overcrowded; and that no swine shall be kept in the city, except under conditions approved by the board. The health officer makes regular inspections, and, at the meetings of the board, reports any nuisances he has discovered and those that have been reported to him. The secretary then notifies the owner of the premises to abate the nuisance. So far the citizens have co-operated with the board, and extreme measures have not been necessary. The board has made a contract for the collection and removal of garbage and house-offal, and the health officer sees that it is kept in proper vessels convenient for removal. The board has issued no regulations regarding the burial of the dead. Permits are issued by the city clerk on the certificate of the attending physician.

INFECTIOUS DISEASES.

Small-pox patients are quarantined at home, and every physician must notify the board of all cases of small-pox, scarlet fever, diphtheria, or typhoid fever that come under his care. No child from any family where there is a case of contagious disease can attend the public schools until two weeks after the removal, recovery, or death of the patient. No child with the whooping-cough is allowed to attend the public schools. Vaccination is compulsory, but it is not done at the public expense. The city owns a pest-house.

The registration of diseases, births, and deaths is done by the city clerk under state laws.

REPORTS.

The board reports annually to the city council, and its report will be published with the regular city documents.

MUNICIPAL CLEANSING.

Street-cleaning.—The streets are cleaned at the expense of the city and with its regular force. The work is done wholly by hand, no sweeping-machines being used. The business streets are cleaned once a week, the alley-ways twice a week, and the side-streets as required. The work is reported as being thoroughly well done. The annual cost to the city is about $550, and the sweepings are dumped in a ravine a mile from the center of the city.

Removal of garbage and ashes.—These are removed by the city under contract. Each householder must furnish suitable vessels and the garbage must be kept separate from the ashes. The contractor uses the garbage, and the ashes are deposited in the same place as the street-sweepings. The city pays $20 a month for the removal of garbage and $60 a month for the removal of ashes.

Dead animals.—The carcass of any animal dying within the limits of the city must be removed by the owner to a sandy lot one mile from the center of the city, and buried. The city marshal furnishes permits for this work, and sees that the carcass is buried deep enough. Last year 42 horses and 3 cows were so buried.

Liquid household wastes.—All chamber-slops and kitchen and laundry wastes are run either into the sewers or dry wells, none being allowed to pass into the gutters. In the thickly-settled parts of the city the sewers take nearly all, while on new streets dry wells are provided until sufficient houses are built to require the laying of a sewer. The dry wells are nominally water-tight, are not provided with overflows, do not receive the wastes from water-closets, and are cleaned out by the city as often as necessary—generally twice a year. There are but few wells in the city, and so far no contamination has been reported from the overflowing or underground escape of the contents of dry wells or privy-vaults.

Human excreta.—About one-quarter of the houses in the city have water-closets, all of which deliver into the sewers, while the remainder depend on privy-vaults. The vaults are nominally water-tight. They must not be nearer than 2 feet to any adjoining lot, must not project into any street or alley-way, and must be cleaned at least twice a year, or oftener if ordered by the board of health, by regular licensed scavengers. The night-soil is taken to a place 2 miles from the center of the city. It is deposited in a hole prepared for the purpose, and is finally used for manure, none of it being allowed on land within the gathering-ground of the public water-supply.

Manufacturing wastes.—Most of the liquid wastes from the manufactories run into the canals and thence into the rivers. The solid wastes are disposed of in the same way as the street-sweepings. The only complaint made regarding this system is that the chemicals from the paper-mills kill off the fish in the river in large numbers.

POLICE.

The police force is appointed annually by the mayor and aldermen and governed by them. The chief of police is the executive officer, has complete control of the force, and administers the service in accordance with the ordinances and the orders of the mayor and aldermen; his salary is $1,000 a year. The rest of the force consists of 13 patrolmen, receiving $800 a year each. Two patrolmen are on duty during the day and 11 during the night. The force made 684 arrests in the past year, the principal causes being drunkenness, assault, breach of the peace, and larceny. Nearly five-sixths of these cases were disposed of by fines. Property either lost or stolen, to the value of $699, was reported to the police, and of this $399 was recovered and returned to the owners. The number of station-house lodgers for the year was 377. The annual expense of the department (1880) is given as $11,523 53.

FIRE DEPARTMENT.

The force of the department consists of 1 chief and 4 assistant engineers, 7 companies of 14 men each, 2 enginemen, 2 stokers of steamers, and 2 drivers—a total of 109. The apparatus consist of 2 steam fire-engines with hose-carriages, 1 hook-and-ladder truck, 2 four-wheel and 2 two-wheel hose-carriages, and 1 four-wheel hose-carriage now used as a relief cart; there is also 1 hook-and-ladder truck held in reserve. There is 5,300 feet of good hose and 2,900 feet of poor hose. There were 20 fires and alarms during the year. The total loss caused by fire was $12,610 21, and, with the exception of $250, insurance was paid on the whole amount. The annual expense of the department (1880) is $13,434 51.

PUBLIC SCHOOLS.

The school year at Holyoke is divided into 3 terms. The average membership for the past year was—first term, 1,874; second term, 1,814; and third term, 1,859. The average attendance and percentage of attendance was, for the first term, 1,668, or 89 per cent.; for the second term, 1,541, or 85 per cent.; and for the third term, 1,629, or 88 per cent. The largest number of teachers employed was 49, and the smallest 47. There are 12 school-houses, with 42 rooms, and the average air-space in the rooms for each pupil is 207 cubic feet. The annual expense of the schools (1880) is $34,174 03.

MANUFACTURES.

The following is a summary of the statistics of the manufactures of Holyoke for 1880, being taken from the tables prepared for the Tenth Census by Allen Higginbottom, special agent:

Mechanical and manufacturing industries.	No. of establishments.	Capital.	AVERAGE NUMBER OF HANDS EMPLOYED.			Total amount paid in wages during the year.	Value of materials.	Value of products.
			Males above 16 years.	Females above 15 years.	Children and youths.			
All industries	123	$8,913,903	4,433	3,861	717	$2,743,142	$7,739,573	$13,667,327
Blacksmithing	4	5,900	19	.....	.....	7,633	4,700	17,500
Boots and shoes, including custom-work and repairing	5	4,900	8	.....	1	4,141	1,900	9,096
Brick and tile	3	26,000	104	.....	.....	22,600	22,375	49,294
Carpentering	8	7,755	93	.....	.....	28,501	75,433	115,510
Carriages and wagons	3	17,000	34	.....	.....	18,475	16,000	43,000
Clothing, men's	5	4,300	10	10	.....	5,428	8,400	18,150
Cotton goods	5	2,810,000	852	1,481	429	717,752	1,419,149	3,088,851
Foundery and machine-shop products	11	282,500	499	.....	2	206,124	218,820	521,592
Painting and paperhanging	8	12,975	41	.....	5	14,887	15,500	37,400
Paper	17	3,476,979	988	1,500	13	793,934	2,709,075	4,610,947
Printing and publishing	5	20,300	34	6	1	14,170	7,181	30,628
Tinware, copper ware, and sheet-iron ware	6	22,500	45	.....	.....	18,280	53,000	79,822
Woolen goods	4	895,794	448	199	127	220,382	423,958	809,851
All other industries (a)	39	1,327,000	1,258	665	139	670,835	2,764,082	4,235,686

a Embracing bags, paper; belting and hose, leather; brass castings; cutlery and edge tools; dyeing and finishing textiles; fertilizers; files; flouring and grist-mill products; glue; lithographing; lumber, planed; lumber, sawed; marble and stone work; mattresses and spring beds; mixed textiles; patent medicines and compounds; plumbing and gasfitting; postal cards; rubber and elastic goods; saddlery and harness; sash, doors, and blinds; screws; shoddy; silk and silk goods; slaughtering and meat-packing; soap and candles; steam-fittings and heating apparatus; tobacco, cigars, and cigarettes; watch and clock repairing; wire wirework; wood-pulp; wood, turned and carved; and worsted goods.

From the foregoing table it appears that the average capital of all establishments is $72,470 75; that the average wages of all hands employed is $304 42 per annum; that the average outlay in wages, in materials, and in interest (at 6 per cent.) on capital employed, is $89,573 56.

LAWRENCE,

ESSEX COUNTY, MASSACHUSETTS.

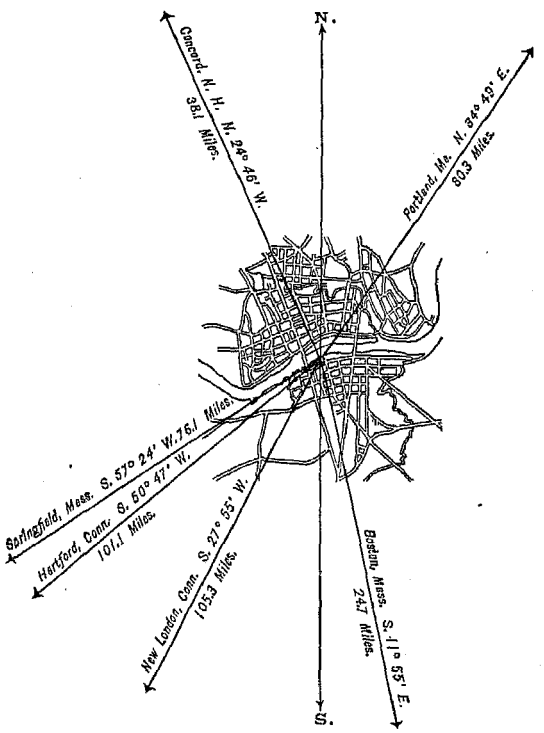
POPULATION

IN THE

AGGREGATE,

1850-1880.

	Inhab.
1790	.....
1800	.....
1810	.....
1820	.....
1830	.....
1840	.....
1850	8,282
1860	17,639
1870	28,921
1880	39,151



POPULATION

BY

SEX, NATIVITY, AND RACE,

AT

CENSUS OF 1880.

Male	17,785
Female	21,366
Native	21,885
Foreign-born	17,266
White	38,996
Colored	*155

*Including 5 Chinese.

Latitude: 42° 42' North; Longitude: 71° 9' (west from Greenwich); **Altitude: 25 to 245 feet.**

FINANCIAL CONDITION:

Total Valuation: $23,083,897; per capita: $590 00. Net Indebtedness: $1,717,000; per capita: $43 86. Tax per $100: $1 64.

HISTORICAL SKETCH.(a)

On March 20, 1845, the legislature of Massachusetts passed an act to incorporate the town of Lawrence, on the Merrimack river, taking about 2,000 acres each from Methuen and Andover to form the new town. Methuen was formerly a part of Haverhill, having been set off and incorporated in December, 1725, while Andover was incorporated in 1646, the first settlers being English, moving from Boston and Charlestown. The Andover tract was known as the "Moose country", or the "Plain of Sodom", and in retaliation the Methuen district was called "Gomorrah". Previous to 1845 little change had taken place here for more than a century. Along the line of

a From Wadsworth's *History of Lawrence.*

the Merrimack were two or three rude fish-wharves, the houses were few, a general inactivity seemed to brood over the section, and the total number of inhabitants was not much over 200, all told. Not a single dwelling was standing on the ground now occupied by the most populous portion of the present city.

Previous to 1835 an old place for a canal from Lowell to tide-water in the Merrimack river fell into the hands of one Daniel Saunders, a resident of Andover, and at that time engaged in woolen manufacture, who, after a study of it and the numerous locking-sites set forth, came to the conclusion that there must be a more considerable fall of water between Lowell and tide-water than was generally recognized. To satisfy himself, he, with only one assistant and no other instrument than a straight-edge and a spirit-level, determined sufficiently close for his purposes the fall of the several rapids between the two points, discovered the mighty power that was hidden under their unassuming form, and decided that one, called Peters falls, between Andover and Methuen, was the place offering the best advantage for a future manufacturing city. Mr. Saunders kept his own counsel and did nothing until 1843, when he began to buy land on the river, and from time to time, as opportunity offered, quietly effected purchases until he held in his own right the whole of Peters falls, which, under the flowage laws of Massachusetts, gave him the right to utilize the same. Having now gone alone as far as he deemed prudent, Mr. Saunders joined with himself three others, under the name of the Merrimack Water Power Association, and at once began the open purchase of land on both sides of the river until they had secured, including the flowage back to Lowell, between 3,000 and 4,000 acres.

On the same day—March 20, 1845—that the legislature incorporated the town of Lawrence, a charter was granted to Daniel Saunders and his associates under the name of the Essex Company, with authority, among other things, to construct a dam at either Deer Jumps or Bordevell's falls, or some place in the river between them, providing that the dam should be so built as not to flow Hunt's falls at Lowell, and also making provision for a commission "of three competent persons to fix and, by permanent monuments, determine the point in the river which is the foot of Hunt's falls".

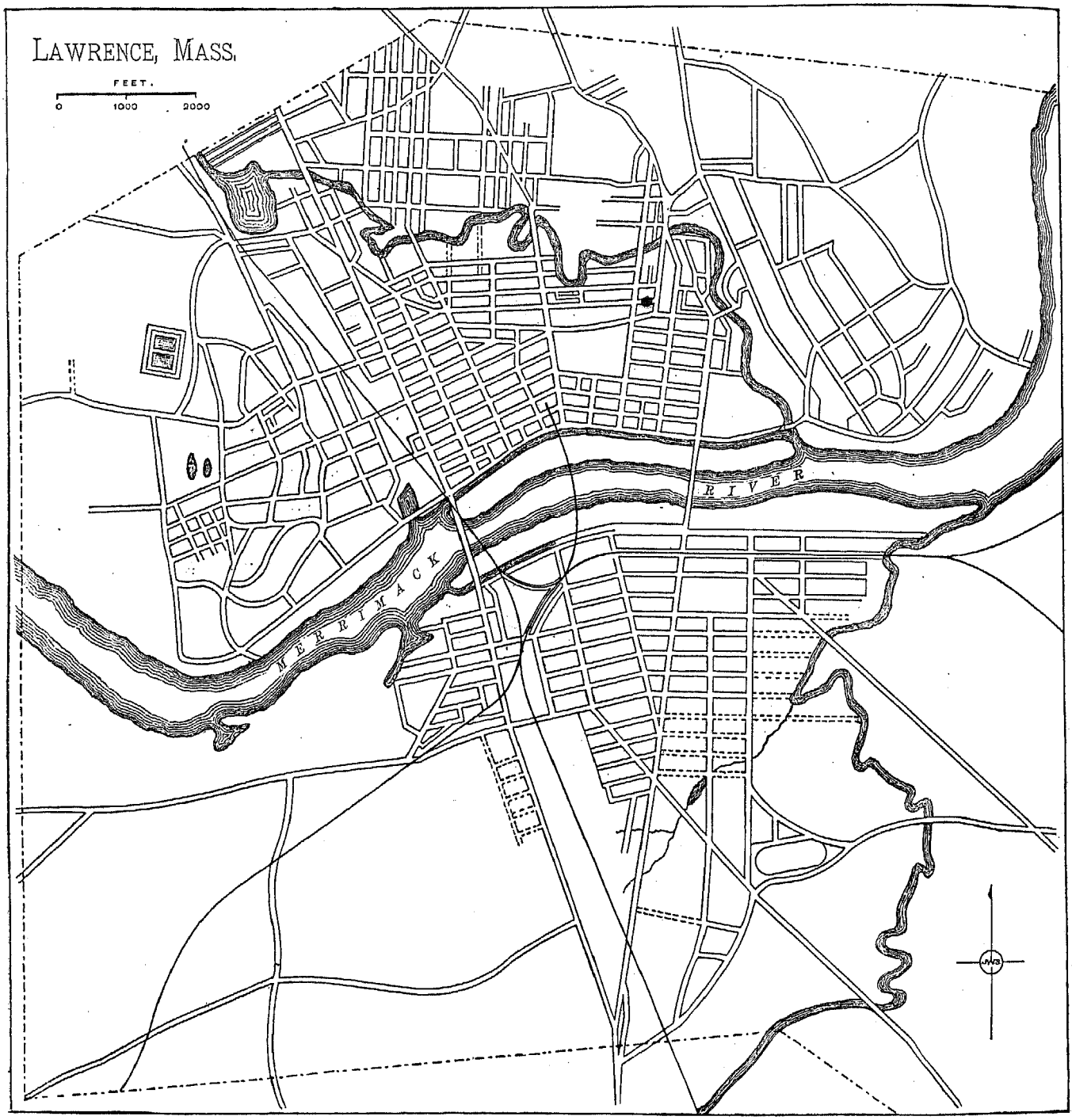
The capital stock ($1,000,000) having been taken up, the company was organized April 16, 1845, and at once began work with a corps of assistants. An accurate survey was made, plans were designed for a dam, canals, mill-sites, as well as streets, lots, and public squares for a town, and on September 19 was laid the first stone of the dam, the structure being completed in a little over two years.

The dam is built of granite, bedded into the bed-rock of the river, is 1,629 feet in length, 35 feet thick at base and 12½ feet at the top, is backed by gravel to within a few feet of the surface, and cost, complete, $250,000. The granite blocks were hammered on the bed and laid in hydraulic cement. The overflow is 900 feet wide and the fall is 26 feet, the dam in some places being as high as 40.3 feet. After the completion of the dam it was found that the water flowed back on Hunt's falls, so some 16 inches had to be hammered off from the top of the great stone headers that project over the fall of the dam, thus interfering somewhat with the symmetry of the structure. The first fishway built around the dam, in compliance with the terms of the contract, did not answer the purpose, and in 1876 another, built under the supervision of the state fish commissioners, was constructed, and is believed to meet all requirements. The North canal, completed about the same time as the dam, is a little over a mile long, 100 feet wide at the upper and 60 feet wide at the lower end, 12 feet deep, and is 400 feet distant from the river and parallel with it. The second canal, on the south side of the river, was begun in 1870, will be 1¼ mile long, and will empty into the Shawsheen river.

The river affords on an average about 5,000 cubic feet of water a second, but sometimes it reaches 60,000. This power is estimated at 150 mill-powers, a mill-power being calculated to take 30 cubic feet of water a second, with a head and fall of 20 feet—equivalent to about 65 horse-power. Mill-powers were sold by the company (with the mill-sites), the first at the rate of $14,333 each—$9,333 being paid down, and the balance, $5,000, remaining perpetually at 4 per cent. interest, payable semi-annually in silver. This price, however, was not a standard, as the Essex Company has continued to sell their mill-powers at such prices as may be agreed upon between the contracting parties.

After the Essex Company had completed their plans of the streets and lots for the new town, and while there were few other than temporary houses on the site of the present city, a public sale of land was advertised on April 26, 1846. This sale was largely attended, good prices—in some cases they were considered fabulous—were realized, steps were taken to give the act of incorporation proper form, and on April 27 of the following year officers were elected and the new town government was installed. The increase of the population was so rapid that additional legislation soon became necessary, and on May 10, 1853, a city charter was accepted by the voters of Lawrence, which, with but slight changes, remains the same to the present time. In 1855 the Essex Company, by another public sale, disposed of some six hundred house-lots in various parts of the city. The water-power still remains in the hands of the company, and in 1878 it was estimated at some 10,000 horse-power, 7,200 of which had been utilized.

The principal manufactures in Lawrence at the present time are the Washington Mills, built in 1846; the Atlantic Mills, built the same year; the Pacific Mills, incorporated in 1852; the Pemberton Mills, incorporated the same year; the Lawrence Dock Company, incorporated in 1853; the Everett Mills, in 1860; the Lawrence Woolen Company, in 1864; the Arlington Mills, in 1865; and the Wright Manufacturing Company, in 1873. There are many


LAWRENCE, MASS.
FEET.
0
1000
2000
MERRIMACK
RIVER

other establishments in the city, as will be seen by a reference to the table of manufactures, under "Lawrence in 1880", on page 233. The average earnings of operatives in the several mills in 1878 were, for men and boys, $1 30, and for women and girls, 90 cents, each, per day.

Lawrence has had two severe fires, one on August 16, 1859, when a hotel, a church, the court-house, and several stores were destroyed and two firemen lost their lives; and the other, on January 10, 1860, when, without a moment's warning, the Pemberton mills, a building five stories high, fell and the ruins took fire. There were 700 persons in the mill when the crash came, and of these 100 lost their lives, 14 being known to have perished in the flames. Lawrence suffered, in common with other parts of the country, in the panics of 1857 and 1873, but quickly recovered each time. The original population was of native birth, but as the industries increased a large foreign immigration set in, and now the population of foreign birth is about 44 per cent. of the whole.

LAWRENCE IN 1880.

The following statistical accounts, collected by the Census Office, indicate the present condition of Lawrence:

LOCATION.

Lawrence lies in latitude 42° 42′ north, longitude 71° 9′ west from Greenwich, on the Merrimack river, 26 miles above its mouth, 8 miles above Haverhill, and 9 miles below Lowell. Methuen lies on the north and west, Andover on the south and west, while North Andover is on the east. The average elevation above sea-level is 100 feet, the lowest point being 25 feet and the highest 245 feet above. The Merrimack river, which here has a descent of 26 feet in half a mile without any sudden fall, is not navigable at Lawrence. Tide-water makes up to Mitchell's falls, some 3 miles below the city, and in the past few years the United States government has so improved these falls that coal-barges of 4 feet draught, and small flat-bottomed steamboats, can now come up to the lower part of the city with but little difficulty.

RAILROAD COMMUNICATIONS.

Lawrence is touched by the following railroads: The Boston and Maine, the Boston and Lowell, the Eastern, and the Manchester and Lawrence railroads; giving three lines to Boston, two to Lowell, one to Maine and the British provinces, and one via Manchester, New Hampshire, to northern Vermont and Canada.

TRIBUTARY COUNTRY.

Owing to its proximity to the older cities of Haverhill and Lowell, Lawrence does not command a large trade from the surrounding towns. These are of a good class of New England agricultural towns, with some large villages scattered through them. A large amount of manufacturing is done within a radius of 3 miles outside the city limits.

TOPOGRAPHY.

The area of the city comprises 4,185 acres, 2,173 on the north side and 2,012 on the south side of the Merrimack river. The Spicket river crosses the northern portion of the city, entering the Merrimack within the limits and just after receiving the waters of the Northern canal, while the Shawsheen river forms a portion of the southeast boundary of the city and enters the Merrimack in the town of Andover. More than two-thirds of this area is a level plain, about 60 feet above sea-level, with three large hills and several smaller ones rising up from it. The soil of the plains is light, sandy, and unproductive, while the hilly portions are clayey and gravelly, fairly productive. There are two kinds of underlying rock—a gneiss and an argillaceous slate. Natural drainage is by the Merrimack, Spicket, and Shawsheen rivers. The surrounding country is higher than the city, is open, and the soil is more productive than that within the city limits. There are no natural ponds, though several artificial ones have been created by dams. There are no marshes near the city.

CLIMATE.

Highest recorded summer temperature, 95°; highest summer temperature in average years, 88°. Lowest recorded winter temperature, —19°; lowest temperature in average years, —3°. Occasionally an east wind brings a slight sea-breeze, which doubtless makes the climate a trifle milder than places in the same latitude but farther west. The prevailing wind, northwest, from the distant hills of New Hampshire, renders the climate colder at the season when these hills are covered with snow.

STREETS.

Total length, about 80 miles. Of these, 200 feet are paved with cobble-stones, 10,700 feet with stone blocks, and 1,800 feet with broken stone. The cost of the stone blocks is from $2 to $2 25 per square yard. Sidewalks are laid in brick and concrete, the greater portion in the latter. Most of the gutters are of earth, a small portion, in

trying localities, being of cobble-stones. Trees were planted years ago when the city was first laid out, and since then there has been only occasional individual planting. The trees are set on the side of the streets in a line with the gutters. All construction and repairs on the streets are done by the city with its own force, under the superintendence of the street commissioner, he hiring the workmen and buying the supplies. The annual cost of this work is $30,000, exclusive of paving. A steam stone-crusher is used.

There is one horse-railroad, 4.6 miles long, with 18 cars, 58 horses, and giving employment to 25 men. During the year, 648,370 passengers were carried, the rate of fare being 2.4 cents per mile.

WATER-WORKS.

The water-works are owned by the city, and cost to date, December 31, 1880, $1,675,986 74. The water is taken from the Merrimack river and pumped into a distributing reservoir of 40,000,000 gallons capacity, about 5,000 feet from the pumping-station, and from there taken through the city in cast-iron mains, the pressure in the pipes being 70 pounds to the square inch. When additional pressure is needed for fires the water can be pumped directly into the mains on the Holly system. The average amount pumped per diem is 1,850,000 gallons, the greatest being 2,350,000, and the least 1,500,000 gallons. The average cost of raising 1,000,000 gallons 1 foot high is 4.71 cents, the yearly cost of maintenance, aside from the cost of pumping, is $8,580, and the yearly income from water-rates, $63,426. There are 72 water-meters used, and their effect is reported to have decreased the consumption.

GAS-WORKS.

The gas-works are owned by a private corporation, and gas is supplied to consumers for $2 50 per 1,000 feet. The city pays nine-tenths of a cent per hour for each lamp while lighted, 247 in number.

PUBLIC BUILDINGS.

The city owns and occupies for municipal uses, wholly or in part, one city hall, school-houses, engine-houses, police stations, city stables, farm buildings, and hearse-house, valued at $329,460. The city hall cost $75,000, and is owned entirely by the city.

PUBLIC PARKS AND PLEASURE-GROUNDS.

Total area, 39.33 acres, in four parks:

Lawrence Common, situated between Lawrence, Jackson, Common, and Haverhill streets; area, 17 acres.

Union Park, situated between Union, Osgood, Salem, and Market streets; area, 10.33 acres.

Storrow Park, situated between Marston, Pleasant, and High streets; area, 7 acres.

Amphitheater, situated in the west part of the city; area, 5 acres.

The land from which these parks were formed was donated to the city by the Essex Company, and during the past thirty years sums varying from $300 to $2,000 annually have been expended on Lawrence common for improvements. Union park has been improved by the Essex Company, but the others are in their natural state. At present the yearly cost of maintenance for Lawrence common is $1,000, and that for the others only nominal. Some 7,000 persons on foot visit the two large parks daily, none being admitted in carriages or on horseback. Lawrence common is managed by the mayor, Union park by the Essex Company, and the others by the city council. There are no special ordinances regarding the parks.

PLACES OF AMUSEMENT.

There is one theater in the city with a seating capacity of 1,400, and one lecture hall seating 1,200. Neither the theater nor the hall pays any license to the city, but each exhibition pays a nominal one.

DRAINAGE.

The sewerage work done in the city is mainly on the north side of the Merrimack river. The main portion of the city is divided by the irregular channel of Spicket river. The plan under which the work is being carried out was prepared in 1876 by L. Frederick Rice, C. E. The outlets of the different sewer districts are delivered into the Merrimack or into the Spicket. The condition of Spicket river had already become very bad at the time of the preparation of Mr. Rice's report. A principal and important feature of his plan was a main intercepting sewer to take all of the dry-weather and light rainfall of the city sewers now finding outlet into the Spicket at various points, to a common outlet near its connection with the Merrimack. This part of the work has not yet been carried out, and the report of a survey made in 1880, with a project for straightening the course of Spicket river (in connection with or independent of the construction of the intercepting sewer), indicates the increasingly

serious character of the defilement of that stream. The total cost of the sewerage of the city, according to Mr. Rice's report, was estimated at $597,973 75. The cost of the intercepting sewer, as modified by the survey of 1880, was estimated at $105,000. The estimated cost of straightening the river as proposed was about $158,000, including the retaining-walls and the filling of the abandoned portions of the channel. Prior to the adoption of the regular plan very little sewerage work had been executed; now, as sewers are ordered to be built, they are constructed, "as near as circumstances will allow", according to the regular plan. Manhole covers are perforated for ventilation. The mouths of the sewers are fully exposed. The cost of sewers is assessed on abutting property to the amount of two-thirds of the cost and according to the area of the property benefited. Main sewers are constructed at the general cost of the city, except that an assessment is levied equal to what would be required for an ordinary branch sewer. The following table gives the average cost of construction in this city:

Tabular statement of cost of sewers in Lawrence, Massachusetts.

Material.	Size.	Average cut.	Average cost per foot.	Thickness of walls in inches.	Character of excavation.
Akron pipe	8 inches.	6.235 feet.	$0.634		Sand and marl.
Akron pipe	9 inches.	7.560 feet.	0.714		Sand.
Akron pipe	10 inches.	7.683 feet.	0.849		Sand.
Akron pipe	15 inches.	9.400 feet.	1.636		Gravel.
Akron pipe	18 inches.	9.930 feet.	2.127		Clayey.
Brick	18 inches.	14.300 feet.		8	Sand.
Brick	18 by 25 inches.	8.650 feet.	1.627	4	Gravel.
Brick	36 inches.	9.900 feet.	6.371	8	Quicksand.
Brick	54 inches.	16.000 feet.	11.540	12	Sand.

CEMETERIES.

There are 4 cemeteries in Lawrence:

Bellevue Cemetery.—In the 5th ward, on May street, between Ferist and Reservoir streets; area, 26½ acres.

Old Saint Mary's Cemetery.—Just beyond Bellevue cemetery, across Reservoir street; area, 23 acres.

New Saint Mary's Cemetery.—Adjoining the Old, and extending into Methuen; area, 21½ acres.

Dew Rock Cemetery.—In the southwest corner of the city, across the Shawsheen river; area, 80 acres.

The first and last of these are owned by the city, the others by the Roman Catholic church. Nothing more could be learned of the cemeteries than that the depth of the grave is 5 feet, unless requested to be deeper.

MARKETS.

There are no public or corporation markets in Lawrence.

SANITARY AUTHORITY—BOARD OF HEALTH.

The chief sanitary authority of Lawrence is the board of health, composed of three members, one of whom is the city physician, appointed annually by the mayor and confirmed by the aldermen. It is dependent on the city government only so far as money supplies are concerned. The annual expense of the board in absence of an epidemic is $8,000, expended in collecting garbage, ashes, etc. During an epidemic its expenses are practically unlimited. Its ordinary authority is sufficient to care for the sanitary needs of the city; while during an epidemic, under the state laws, its authority is unlimited. The chief executive officer is the agent, with a salary of $800. He acts for the board when it is not in session, and has charge of the men and teams of the health department. He has authority to enter houses and see that the health regulations are enforced. The board meets when summoned by the chairman. Inspections are made regularly, and also when nuisances are reported. When a nuisance is discovered or reported, the agent inspects it and notifies the owner to abate it. Defective house-drainage, privy-vaults, cesspools, and sources of drinking-water are inspected by the board and ordered cleaned and corrected. The street department has control of sewerage and street-cleaning; but when defective sewerage exists, the agent notifies either the mayor or the street commissioner. The board has entire control of the conservation and removal of garbage. Vaults can be cleaned only on a license from the board. No dead animal or dead or decaying animal or vegetable matter can be thrown into any waters within the city, except on a license from the board of health.

INFECTIOUS DISEASES.

Small-pox patients are removed to the pest-house situated on the outskirts of the city. Scarlet-fever cases are not quarantined; neither does the board take cognizance of contagious diseases in the public or private schools. Vaccination is compulsory, and, if a person is unable to pay, is done at public expense. The registration of diseases, births, and deaths is done by the city clerk, who is, under the state laws, registrar of vital statistics.

REPORTS.

The board makes an annual report to the city council, including the agent's report, and this is published with the city documents.

MUNICIPAL CLEANSING.

Street-cleaning is done by the city with its regular force. The paved streets are cleaned with sweeping-machines once a week; the others by hand whenever necessary. No separate account of the expense is kept. The sweepings are deposited on a vacant lot within the city limits, and later used as a top-dressing for the parks. The committee on streets supervises this work, and it is done under the superintendent of streets.

Removal of garbage and ashes.—All garbage and ashes are removed by the city with its own force, under the superintendence of the agent of the board of health. Suitable vessels are furnished to householders, and must be kept in places convenient for removal. Garbage and ashes must be kept separate. The appropriation for this service is $7,000. The garbage is taken to the city farm and used to feed swine, while the ashes are used as filling on the highways. The system works well—much better than a contract system which was previously tried.

Dead animals.—The carcasses of animals dying in the city are at once removed by the city teams under charge of the board of health and properly buried. No separate account of this expense is kept. About 40 or 50 horses, it is estimated, are removed annually.

Liquid household wastes.—Nearly all these wastes are run into the sewers, or, in cases where no sewers exist, into cesspools approved by the board of health. None can be thrown on the ground or into the gutters. The cesspools are generally porous, do not receive the wastes from water-closets, are unprovided with overflows, and when full are emptied by the board of health. The liquid portion is pumped into tight covered carts and the solid matter raised and carted away. Several wells are known to have been contaminated by the escape of the contents of cesspools and privies, either through defective sink-spouts or improper drainage.

Human excreta.—About one-quarter of the houses of the city have water-closets, all delivering into the sewers; the balance depend on privy-vaults. These must be made of hard-burned brick, bottom and sides, laid in cement; must not enter any sewer; the contents must not come within 1 foot of the top, and when offensive they must be cleaned. All vaults are cleaned by the odorless excavator under permits from the board of health. The night-soil is taken out of the city and sold to farmers as a fertilizer, none being allowed within the gathering-ground of the public water-supply.

Manufacturing wastes.—All the manufacturing establishments in the city have connections with the sewers, and dispose of their liquid wastes through them. The final disposal of the solid wastes was not stated.

POLICE.

The police force is appointed annually by the mayor and aldermen, and governed by the committee on police, consisting of the mayor and two aldermen, who, in conjunction with the city marshal, administer it. The city marshal is the chief executive officer of the department, enforces the rules, and is responsible for the conduct of the force; his salary is $1,100 a year. There is 1 assistant marshal, at $2 75 a day; 1 captain of the night watch, at $2 50 a day; 24 patrolmen, at $2 20 a day each; and 2 janitors, also at $2 20 a day each. The uniform is a dark-blue double-breasted frock coat; vest and trousers of the same material; the coat has police buttons. The men provide their own uniforms, at a cost of about $65 each. They are equipped with a revolver, club, dark-lantern, and a pair of twisters. The hours of duty are ten hours each, and all the streets of the city (about 80 miles) are patrolled. During 1880 the total number of arrests was 2,328, the principal causes being drunkenness, 1,150; assaults, 214; larceny, 157; and for safe-keeping, 308. The larger part of the cases were disposed of by fines. The total amount of property lost or stolen and reported to the police was $4,464 58, and of this $3,856 44 was recovered and returned to the owners. The total number of station-house lodgers was 583, against 953 in 1879 and 1,259 in 1878. Hard crackers to the value of $50 annually are given to the lodgers. The police must assist the fire department by maintaining order at fires. Special officers for corporations and private service are appointed in the same manner as regular men, and are liable to be called to replace any regular officer. The cost of the department in 1880 was $24,579 23. The chief of police recommends strongly an appointment of officers to last during good behavior, instead of simply a year as at present.

MANUFACTURES.

The following is a summary of the statistics of the manufactures of Lawrence for 1880, being taken from tables prepared for the Tenth Census by Robert A. Harmon, special agent:

Mechanical and manufacturing industries.	No. of establishments.	Capital.	AVERAGE NUMBER OF HANDS EMPLOYED.			Total amount paid in wages during the year.	Value of materials.	Value of products.
			Males above 16 years.	Females above 15 years.	Children and youths.			
All industries	229	$18,698,977	7,810	7,908	992	$5,544,513	$13,862,142	$25,058,246
Blacksmithing	11	25,725	28	.....	.....	15,051	10,637	40,298
Boots and shoes, including custom work and repairing	21	4,860	112	.....	.....	8,977	15,433	34,179
Brass castings	3	4,000	10	.....	.....	4,913	6,150	16,400
Bread and other bakery products	8	46,600	57	1	.....	28,951	124,747	174,820
Carpentering	19	29,650	163	.....	.....	76,738	152,105	276,407
Carriages and wagons	6	13,050	42	.....	.....	20,521	12,661	43,495
Cotton goods (see also Mixed textiles)	7	5,350,400	1,264	3,235	246	1,310,358	2,915,195	5,059,964
Dyeing and finishing textiles	3	1,645,000	1,069	140	102	489,408	993,441	2,593,000
Flouring- and grist-mill products	3	258,000	28	.....	.....	14,960	479,375	510,152
Foundery and machine-shop products	21	296,362	268	24	12	137,296	232,929	473,244
Marble and stone work	7	21,200	24	.....	.....	10,478	9,341	27,448
Masonry, brick and stone	5	14,750	136	.....	.....	40,114	82,783	131,497
Mineral and soda waters	3	9,000	22	.....	.....	11,158	11,418	31,090
Mixed textiles (see also Cotton goods; Woolen goods)	3	2,620,500	1,171	1,073	122	796,785	1,907,652	3,442,798
Painting and paperhanging	18	8,125	54	.....	.....	20,278	13,048	46,967
Paper	3	410,000	313	157	1	176,114	610,545	972,050
Photographing	6	7,800	5	2	.....	2,724	4,606	18,460
Plumbing and gasfitting	3	6,300	13	.....	1	6,836	21,975	34,181
Printing and publishing	4	35,000	32	.....	9	20,500	12,450	45,540
Saddlery and harness	5	7,675	11	.....	.....	6,047	8,806	19,412
Sash, doors, and blinds	3	11,245	37	.....	.....	19,625	61,813	90,416
Soap and candles	4	54,300	25	.....	.....	11,075	81,890	113,420
Tinware, copperware, and sheet-iron ware	9	26,550	37	.....	.....	21,036	42,146	89,400
Tobacco, cigars, and cigarettes	6	4,200	9	2	.....	5,985	7,719	19,187
Upholstering	4	4,900	10	.....	.....	6,300	18,500	32,900
Woolen goods (see also Mixed textiles; Worsted goods)	3	3,050,000	1,497	1,168	132	896,854	2,189,989	3,823,378
Worsted goods (see also Woolen goods)	5	4,211,385	852	2,091	307	1,149,434	3,101,068	5,076,428
All other industries (a)	36	521,800	530	15	.....	235,097	733,770	1,221,795

a Embracing awnings and tents; baking and yeast powders; belting and hose, leather; bookbinding and blank-book making; brooms and brushes; carriage and wagon materials; coffee and spices, roasted and ground; combs; confectionery; cooperage; drugs and chemicals; files; furniture; leather board; liquors, malt; looking-glass and picture frames; lumber, planed; models and patterns; patent medicines and compounds; paving materials; pumps; sewing machines and attachments; shirts; slaughtering and meat-packing; stone- and earthen-ware; and wood, turned and carved.

From the foregoing table it appears that the average capital of all establishments is $81,654 92; that the average wages of all hands employed is $331 62 per annum; that the average outlay in wages, in materials, and in interest (at 6 per cent.) on capital employed is $89,644 51.

LOWELL,

MIDDLESEX COUNTY, MASSACHUSETTS.

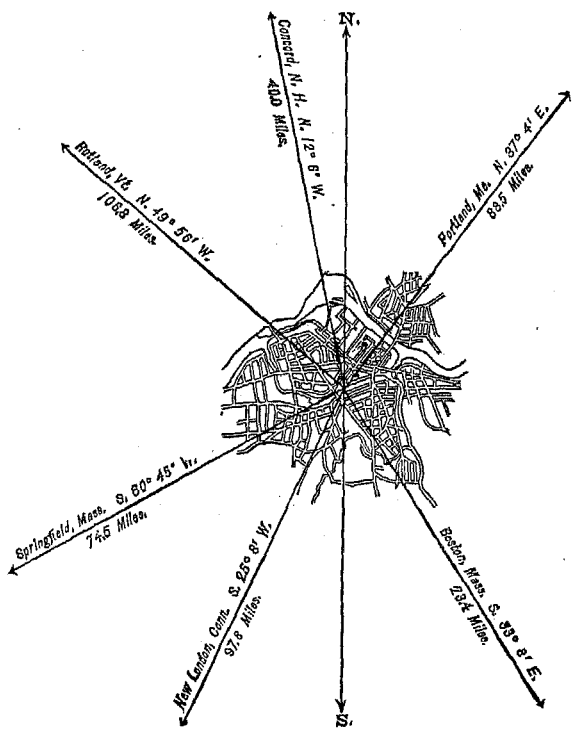
POPULATION

IN THE

AGGREGATE,

1830-1880.

	Inhab.
1790	
1800	
1810	
1820	
1830	6,474
1840	20,796
1850	33,383
1860	36,827
1870	40,928
1880	59,475



POPULATION

BY

SEX, NATIVITY, AND RACE,

AT

CENSUS OF 1880.

Male	26,853
Female	32,622
Native	36,421
Foreign-born	23,054
White	59,292
Colored	*183

*Including 6 Chinese.

Latitude: 42° 38′ North; Longitude: 71° 19′ (west from Greenwich); **Altitude: 40 to 250 feet.**

FINANCIAL CONDITION:

Total Valuation: $39,677,399; per capita: $667 00. Net Indebtedness: $1,554,274; per capita: $26 13. Tax per $100: $1 34.

HISTORICAL SKETCH.(a)

In 1653 the Rev. John Eliot, the apostle of the Indians, established where the city of Lowell now stands a town of converted Indians, which was called *Wamesit*. It ceased to exist in 1686, if not earlier. Lowell, which contains territory once included in the towns of Chelmsford, Dracut, and Tewksbury, was incorporated as a town in 1826, and was granted a city charter in 1836. It owes its existence to the abundant water-power of the Merrimack and Concord rivers, at whose confluence it is situated.

a Hon. Charles Cowley, of Lowell, not only secured and transmitted nearly all the detailed information regarding the present condition of Lowell, in response to schedules of interrogatories, but also furnished the historical sketch of the city with which this report is introduced.

Pawtucket falls on the Merrimack, Wamesit falls on the Concord, and the myriads of fish which sported and spawned in these waters made this place a favorite rendezvous of the Indians long before the Lowell family left their ancient home in Wales.

A hundred years ago great quantities of lumber from the forests of New Hampshire were sent down the Merrimack every year in rafts. To facilitate the transmission of these rafts and the passage of boats by the Pawtucket falls it became necessary to cut a canal around the falls. This was done in 1796 by a company incorporated in 1792 under the name of "The Proprietors of the Locks and Canals on Merrimack River". The chief object of this company and their canal was to make the Merrimack navigable for boats and rafts to its mouth at Newburyport, which object was soon defeated or superseded by another company, which in 1804 opened another canal—the Middlesex—from above the Pawutcket canal to Boston. The water-power of Lowell is 14,000 horse-power. The Merrimack here makes a descent of 35 feet, and affords at all seasons 10,000 horse-power, and usually much more. The Concord has three falls here—the first being 26 feet, the second 8 feet, the third 10 feet—and affords 900 horse-power.

The first woolen carding-mill in this place was started by Moses Hale, in 1801; the first cotton-mill by Phineas Whitney and Josiah Fletcher, in 1813; the first power-mill by Moses Hale, in 1819. Fisher and Ames established a forging-mill here about the same time. Saw-mills and grist-mills were also established here. But all these establishments were small, and the building of Lowell had not yet begun.

Before the beginning of the year 1821 the founders of the Boston Manufacturing Company at Waltham had appropriated all the water-power of the Charles river, and with others who wished to engage in the cotton manufacture with them they were looking about for another place enriched with more abundant water-power. The first person who suggested the application of the water-power of the Merrimack for manufacturing purposes was Ezra Worthen. He made the suggestion to Paul Moody in the autumn of 1821, and he and Moody made a visit to the Pawtucket falls and canal. Mr. Moody reported the result of that visit to Patrick T. Jackson in Boston, and explained to him, by chalking on his office-floor a rude map of these falls and of this canal, how a lateral canal could be cut from Pawtucket canal to the river-bank, and how cotton-mills built upon the bank could be driven by the water-power of the river running through the canal to their water-wheels. The next visit to this place was made by Jackson and Moody. Neither the date of this visit nor of the previous visit of Moody and Worthen has been preserved, but the result is known—Lowell is the result.

Then began the business of buying up the farms, which was done as privately as possible, the conveyances being taken in the name of the agent of the founders, the father of Thomas M. Clark, the present bishop of Rhode Island. The first farm purchased was that of Nathan Tyler, whose deed bears the date of November 2, 1821. On the 21st of the same month three other farms were purchased, conveying about 400 acres of land in all. Six of the founders then made a visit to the place, walked over the grounds and scanned the capabilities of the place, which was then an inconsiderable village, but which now contains nearly 60,000 inhabitants, with real and personal estate to the value of nearly $40,000,000.

Efforts to hire the water-power of the Merrimack from the old proprietors of the locks and canals having failed, the founders of Lowell quietly proceeded to purchase a majority of the shares of their stock, and thus obtained the control of that corporation. They then widened the canal to the width of 60 feet and deepened it to the depth of 8 feet, and cut a lateral canal from it to the river-bank, on which they proceeded to erect cotton-mills. In September, 1823, the villagers who had sold their stock for less than the par value thereof, and their lands for a trifling consideration, saw with astonishment and chagrin the Pawtucket canal successfully applied to manufacturing purposes, and converted into "a potentiality of wealth beyond the dreams of avarice". It is said that one of the early farmers who sold his farm for $2,500 (a good price for it as prices had been) lost his reason on learning that he might have obtained $10,000 for it, and never saw another happy day.

Boarding-houses for their female operatives are provided by all the great corporations in Lowell, which are engaged in textile manufactures, except one. Good quarters and ample supplies of wholesome food are thus secured at moderate prices. This system also enables the corporations to exercise a close supervision over the morals of the operatives, the matrons to whom they let these boarding-houses forming the most efficient moral police conceivable. But the efficiency of this system has been somewhat impaired in later years by the introduction among the female operatives of the practice of hiring sleeping-rooms from private tenement owners, and merely taking their meals at the corporation boarding-houses. In other manufacturing cities where no boarding-houses are provided by the corporations, the operatives live in tenement houses which are generally far inferior to those that are owned by the corporations of Lowell. Senator Benton, of Missouri, pronounced the factory boarding-houses which he visited in Lowell to be fully equal to many boarding-houses of members of Congress in Washington.

The water-power of the Merrimack is owned by the proprietors of the locks and canals, and is leased to the nine principal manufacturing companies of Lowell, whose aggregate capital is nearly $15,000,000. Each of these companies has a certain number of mill-powers—some more, some less. The unit "mill-power" was adopted very early in the local history, and is still retained because of its convenience. It is the power originally required for a cotton-mill containing 3,584 spindles; or, in other words, it is the power which is yielded by 35 cubic feet of water falling 30 feet per second. This is the standard, but in practice the quantity of water varies with the water-fall,

from 60 to 65 horse-power. The whole number of mill-powers is 139.37. This is the permanent power of the Merrimack, but at most seasons the surplus power, as above stated, is large. By all the companies the water-power is heavily re-enforced by steam, particularly during the dry seasons.

By having all the water-power of the Merrimack owned by one corporation (the Locks and Canals Company), which uses no part of it itself, but leases the whole of it to other corporations upon equal and equitable terms, the managers of the cotton-manufacturing corporations here avoided contentions among themselves which might otherwise have led to constant and ruinous litigation. The greater part of the stock of these corporations has generally been owned outside of Lowell, consequently the valuation of Lowell was for many years low. In later years many establishments have been built up by private owners residing in Lowell, and the valuation of the city has thereby been much augmented.

Fires have been frequent, but none of sufficient magnitude to retard the growth of the city. Three great periods of depression began in 1837, in 1857, and in 1873, respectively, and ended in 1840, in 1860, and in 1880, respectively. The original population was American, with a sprinkling of English, Irish, and Scotch, but it has undergone extensive changes. About one-third is now Irish or of Irish extraction, and one-seventh is Canadian French, the famine in Ireland and the demand for labor having been the chief causes for these changes.

LOWELL IN 1880.

The following statistical accounts, collected by the Census Office, indicate the present condition of Lowell:

LOCATION.

Lowell lies in latitude 42° 38′ north, longitude 71° 19′ west from Greenwich, at the confluence of the Concord and Merrimack rivers, about 8 miles south of the New Hampshire state line. The average altitude above mean sea-level is 100 feet, varying from 40 feet, the lowest point, to the highest, 250 feet above. The Merrimack river is not navigable here, but a canal around the falls enables small boats to pass up and down from Nashua, New Hampshire, to the sea.

RAILROAD COMMUNICATIONS.

The following-named railroads touch at Lowell:
The Boston and Lowell railroad, connecting with Boston.
The Lowell and Lawrence railroad, connecting with Lawrence.
The Salem and Lowell railroad, to Salem.
The Stony Brook railroad, connecting with Ayer.
The Framingham and Lowell railroad, connecting with Providence, New Bedford, and Fall River.
The Nashua and Lowell railroad, connecting with the Great Northern line to Canada.
The Lowell and Andover railroad, connecting at Ballardvale with the Boston & Maine railroad, to Boston, and east to Portland and the British provinces.

TRIBUTARY COUNTRY.

There are ten villages within a radius of 10 miles from the city, all of which, with the exception of a few small woolen manufactures in Billerica, Chelmsford, and Dracut, are chiefly engaged in agriculture. This is not very flourishing, as much of the tributary country is poor and sparsely settled, the soil being light and sandy. Hay, Indian corn, rye, potatoes, squashes, pumpkins, milk, butter, cheese, and eggs are the principal products.

TOPOGRAPHY.

Lowell is situated on both banks of the Merrimack river, the principal portion being on the right bank just above the point where the Concord river empties, 35 miles from its mouth and 9 miles above Lawrence. The city lies on primitive rock, granite, mica, slate, and hornblende, overlaid with sand and gravel. The cut through which the Northern railroad passes discloses some remarkable extensions of trap-rock. Traces of glacial action are found in the bed of the Merrimack river and on ledges near by. The surface is undulating and the drainage is generally good. The surrounding country has about the same relative elevations, is open, has no marshes, but contains ponds near the city.

CLIMATE.

Highest recorded summer temperature, 103°; the highest summer temperature in average years has varied between 89° and 103° in the past thirty-four years. Lowest recorded winter temperature, —24°; the lowest winter temperature in thirty-four years has varied from —24° to 8°. The climate is that usual in the interior of New England.

LOWELL,
MASS.
SCALE OF FEET.
0
1000
2000
3000
4000
5000
CHELMSFORD
MERRIMACK RIVER.
DRACUT
MERRIMACK
NIAGARA
TEWKSBURY.

STREETS.

The total length of accepted streets is 79 miles and of unaccepted streets 20 miles, paved as follows: Stone-blocks, 4.10 miles; tar-concrete, 35 miles; wood, 56 miles; and most of the others in gravel. Stone blocks cost $1 50 per square yard, including grading; wood, in 1874, cost $3 25 and $3 50 per square yard; in 1875, $2 25 per square yard, not including gradings; and the concrete $1 90 per square yard, not including gradings. The blocks cost but little to keep in repair; the wood will last from 5 to 7 years, and concrete averages 10 cents per square yard each year. Concrete pavement is washed clean by each rain, while the wood and stone blocks have to be swept with a sweeping-machine. The stone blocks are reported as being the most economical. The sidewalks are of brick and concrete, with granite edge-stones, and the gutters, 4 feet wide, are of cobble-stones. The shade-trees along the streets are set out by the abutters and then become the property of the city. The street-work is done by the day, this method being preferred to contract work. The amount expended annually by the street department ranges from $50,000 to $75,000. A large granite roller, drawn by four or six horses, is used on the street-repairs.

There is one horse-railroad in Lowell, total length 5 miles, with 19 cars and 60 horses, and employing 25 men. The total number of passengers carried during the year is 675,000, the rates of fare being 6 cents, or, when tickets are purchased, 5 cents. There are no omnibus lines.

WATER-WORKS.

The works for the water-supply are owned by the city, the total cost, including interest on the water-loan, being $2,832,540. Water is taken from the Merrimack river through a filtering gallery and pumped to the distributing reservoir, the average amount pumped per day being 2,248,850 gallons—greatest, 2,571,980; least, 2,002,780 gallons. To January 1, 1880, there were 60.66 miles of street-mains, 5,075 services, and 11,427 water-takers. The average cost of raising 1,000,000 gallons 1 foot high is 5¼ cents; yearly cost of maintenance, aside from cost of pumping, $9,767 89; yearly income from water-rates and service-pipes, $104,357 45. There are 582 water-meters in use, and they are found to reduce the consumption of water in a majority of cases.

GAS.

Gas is supplied by a private corporation, the average daily production of the works being 263,000 cubic feet. The charge to consumers is $1 80 per 1,000 feet if paid within five days; if not then paid, $2 is charged. The city pays 0.0072 cent per hour for each street-lamp.

PUBLIC BUILDINGS.

The city owns and occupies for municipal uses, wholly or in part, City hall, Huntington hall, Jackson hall, police court and police-station, 8 engine- and hose-houses, almshouse, and city farm, the total cost being $205,550. The county buildings, jail, and court-house are not included in the above.

PUBLIC PARKS AND PLEASURE-GROUNDS.

There are 4 parks in Lowell, with a total area of 36¼ acres, as follows:

South Common, situated between Summer, Highland, Thorndike, and South streets, near the center of population; area, 22 acres; is very undulating, and is planted in shade-trees and grass.

North Common, situated between Fletcher, Common, West Clark, and Cross streets; area, 11 acres; has the same characteristics and is improved in the same way as the South common.

Park Garden, area 1¾ acre, and *Mount Vernon Park*, area 1½ acre, are outlying.

The cost of each of the parks, including land purchase and construction, was, for South common, $23,000; North common, $17,000; Park garden, $3,300; Mount Vernon park, $3,000; and the yearly cost of maintenance is, for the first, $1,500; the next, $1,000; and $500 for the two smaller ones. There are thoroughfares crossing the parks for foot-passengers, but no record has been kept of the number of visitors annually. The parks are controlled by the board of aldermen.

PLACES OF AMUSEMENT.

Music hall, 111 by 47 feet, with galleries on three sides, has a seating capacity of 893, and is used for theatrical performances; it pays a license to the city of $25 annually. Huntington hall, 130 by 75 feet, has a seating capacity of 1,815 and standing-room for nearly 1,200 more; is occasionally, but not often, used for theatrical purposes. Jackson hall, 75 by 65 feet, with a capacity for 1,000 persons, seats 700. Mechanics' hall, 60 by 43 feet. These last-mentioned halls are used for meetings, lectures, balls, etc.

DRAINAGE.

A complete plan for the sewerage of this city was submitted in 1873 by David W. Cunningham, who availed himself, as far as possible, of the strong current and considerable volume of the Merrimack river to secure an

immediate and satisfactory disposal of the outflow. So far as it was necessary to deliver sewage into the more sluggish Concord river, the discharge was made below its lowest dam. For a considerable section, however, it was found necessary to discharge sewage above the dams, and in some cases into a small tributary of this river.

The undulating surface of the city offered favorable conditions for the work, which were offset to a certain degree by the necessity for carrying the conduits under the canals by which the water of the Merrimack is supplied to the mills.

In Mr. Cunningham's project the city is divided into 11 different drainage areas, covering about 2,400 acres. The aggregate length of available sewers built at that time was about 13.4 miles. It was recommended that there be constructed at an early day 27.3 miles, leaving 10.6 miles to be built to meet future needs.

The estimate of cost of the whole system complete was $995,488.

The agent of the Census Office, Charles Cowley, esq., in reply to the schedule of interrogatories, says that there were originally no troublesome water-courses; that in the infancy of the city there were private drains in use, which, however, were not incorporated with the modern sewers. Work thus far done has been generally according to a system, though without rigid adherence thereto.

The sewers are ventilated by perforated manhole covers. The outlets are generally exposed at low water. The sewage flows more or less directly into the Merrimack river, which seems to afford a sufficient means of disposal. It has been necessary to remove sewer deposits by hand or by artificial flushing in only a single instance. Two-thirds of the cost of lateral sewers is assessed on abutting property by area to a depth of 100 feet. All work done since 1874 has been by the day.

Lowell lies on both sides of the Merrimack and Concord rivers and on both sides of Beaver brook, Stony brook, and River Meadow brook. Drainage is easy. Nothing has occurred here that would be of value elsewhere, except where the local topographical conditions were the same.

CEMETERIES.

Lowell has 10 cemeteries and burial-grounds, but most are small and little used. The principal ones are—

Lowell Cemetery.—In the 6th ward, on the Concord river; area, 30 acres.

Edson Cemetery.—Between Gorham street and old Middlesex road, adjoining the town of Chelmsford; area, 20 acres.

The Catholic Cemetery and *Cemetery No. 2.*—On Gorham street, between Quebec and Manchester streets.

A cemetery on Hildreth street in the 2d ward.

Only two interments have ever been made in any Lowell church-yard. There were five cemeteries in the territory annexed from Dracut, but only one is much used. No record of the number of interments exists. No ordinances regulate interments. Lowell cemetery is owned by a corporation incorporated in 1841. It is beautifully laid out. The lots, which originally sold for $10 each, are now valued at $250. About 150 interments have been made in this cemetery annually.

MARKETS.

There are no public or corporation markets in the city.

SANITARY AUTHORITY—BOARD OF HEALTH.

The chief sanitary authority of Lowell is a board of health of three members, the city physician *ex officio*, and two others, not members of the city council, appointed by the mayor with the consent of the aldermen. The annual expense of the board in the absence of an epidemic varies, being, in 1877, 1878, and 1879, $2,000, while in 1880 it was $6,000; it is incurred in the removal of dirt, ashes, and garbage, salaries, and the maintenance of two public baths. During an epidemic no limit is set to the expenses of the board. In ordinary times the board has authority to make and enforce such regulations as will best maintain the general health, while during an epidemic its authority is not limited by law. The chairman, with a salary of $500 a year, is the chief executive officer, presides at meetings, makes inspections, and sees that the regulations are enforced. No assistants are employed, but the city marshal must enforce the rules of the board. The city council controls only the expense of the board. It meets regularly once a month, and specially when called by the chairman. Inspections are sometimes made, and the chairman inspects as often as twice a month those parts of the city most likely to engender disease. When a nuisance is reported, the owner of the premises is ordered to remove it, and if he refuses he is fined, on complaint of the board, in the police court. The procedure is the same in cases of defective house-drainage, privy-vaults, cesspools, and sources of drinking-water. When defective sewerage and street-cleaning come to the notice of the board, the city council is notified and remedies are suggested, or the board has the matter corrected at the expense of the city. It has full control of the conservation and removal of garbage. Certificates of death by the attending physician must be approved by the board before a burial permit will be granted; in cases where no physician attended, the chairman certifies as to the cause of death. No regulations have been issued as to pollution of streams. The removal of excrement is controlled by the board.

INFECTIOUS DISEASES.

Small-pox patients are removed to the pest-house 1½ mile from the populous part of the city. Scarlet-fever patients are quarantined at home. In cases of contagious diseases among school-children the board prohibits from attending the schools all children from families where the cases exist. The board enforces isolation as far as possible before removing to the pest-house. The registration of births, diseases, and deaths is done under the statute by the city clerk, who is registrar of vital statistics. Vaccination is compulsory, and is done at public expense.

REPORTS.

The board makes an annual report to the city council, and this is published with the other city documents.

MUNICIPAL CLEANSING.

Street-cleaning is done by the city with its regular force. The cleaning is done mostly by machine—the principal streets once a week, the others once a month. The work is said to be well done. The annual cost to the city is $8,000, and the sweepings are sold to farmers.

Removal of garbage and ashes.—All garbage is removed by offal-gatherers, who are licensed by the board of health. These gatherers pay $5 for a license, and receive no pay. The garbage must be kept in covered vessels, not mixed with ashes or house-dirt, and is removed every other day. It is taken out of the city and fed to swine. Ashes and house-dirt must be kept in boxes or barrels, is removed by teams under the direction of the board of health, and is used for filling. The cost to the city for this is $6,000 annually.

Dead animals.—Carcasses of large animals—horses, cows, swine, etc.—dying within the city are removed by soap-makers, when they are notified of the death, without charge. Carcasses of dogs and smaller animals are removed by the board of health and buried. No separate account of the expense is kept.

Liquid household wastes.—Chamber and kitchen slops and laundry wastes nearly all are run into the public sewers, none being allowed to pass into the gutters, and only a small portion going into cesspools. These cesspools are porous, without overflows, and except in three known cases do not receive the wastes from water-closets. There are no regulations as to cleaning them out.

Human excreta.—Fully one-quarter of the houses are provided with water-closets that deliver into the public sewers; the remaining houses depend on privy-vaults. These latter must be built of brick and cement, large enough to contain 80 cubic feet, must be 2 feet from any party-line, and the contents must not rise nearer than 2 feet from the top. They can be opened only on a permit of the board of health, and the contents during the summer months can be removed only by the odorless-excavator process, and during the other months in tight carts. The night-soil is used on farms beyond the city limits, none being allowed on the gathering-ground of the public water-supply.

Manufacturing wastes.—All manufacturing wastes are run into the sewers, rivers, or brooks, and so far no complaint has been made of the system.

POLICE.

The police-force is appointed and governed by the mayor and aldermen, the committee on police approving all bills and controlling the annual appropriations. The city marshal is the chief executive officer, commands the force, prosecutes all offenders in the police court, and acts as health commissioner with the board of health. His salary is $1,700 per annum. The rest of the force consists of 2 deputy marshals, at $3 a day each; 2 sergeants, at $2 75 a day each; and 55 patrolmen, at $2 50 a day each, divided into 27 day police, viz, 2 seizure officers, 2 detectives, 2 warrant officers, 2 keepers of lock-up, and 19 on patrol, and 28 night police. The uniform is of blue cloth, with brass buttons marked "L. P.". The head-wear in winter is a blue cap, in summer a black straw helmet. Each man furnishes his own uniform, at a cost of from $40 to $50. They are equipped with club, revolver, whistle, handcuffs, and chain twisters. The hours of service are 8 a. m. to 7 p. m. for day; 7 p. m. to 4 a. m., and 11 p. m. to 8 a. m., the two reliefs of the night police. They patrol 100 miles of streets. During 1880 the police made 2,776 arrests, the principal causes being drunkenness 1,678, assault 213, and larceny 189. Of $9,987 76 lost or stolen and reported to the police, $7,442 07 was recovered and returned to the owners. The total number of station-house lodgers was 1,252, against 1,273 in 1879. These lodgers are furnished with crackers and tea, and compelled in return to saw 2 feet of wood. The police must co-operate with the fire department, with the board of health, with the building department, and with the superintendent of streets. Special police are appointed by the mayor and aldermen for special buildings, factories, churches, halls, etc. They are paid by their employers, but are subject to the orders of the city marshal. The yearly cost of the force for 1880 was $50,000. Mr. Cowley, on closing the report on police, says: "The introduction of the practice among female operatives of having sleeping-rooms not connected with the corporations has been followed by an increase in the number of cases under the bastardy act."

FIRE DEPARTMENT.

The force consists of 1 chief and 4 assistant engineers, 3 steam companies—1 of 12 and 2 of 11 men each—4 hose companies of 9 men each, 2 hook-and-ladder companies—1 of 10, the other of 16 men—and 1 protective company of 7 men, making a total of 108 men. The chief engineer and 12 drivers are permanent, the remaining 95 men being subject to call only during an alarm of fire. The apparatus consists of 3 steam fire-engines, 7 hose-carriages, 2 hook-and-ladder trucks, 7 hose-reels on runners, 8 fuel-wagons, and 12,400 feet of hose. There are 18 horses belonging to the department. There are 669 hydrants under charge of the chief engineer, and the department is charged $20 a year for each one. The total loss by fires during the year was $300,463 85, and on this $298,913 85 of insurance was paid. The fire-alarm telegraph is a 4-circuit automatic repeater with battery, has 30 miles of wire, 47 signal-boxes, 5 engineer's gongs, 10 engine-house gongs, 10 indicators, and 7 strikers. The total expense for the fire department, including the charge for hydrants, in 1880, was $54,147 31.

PUBLIC SCHOOLS.

The superintendent of the schools, in his report for 1880, gives the following information in regard to the schools of Lowell: The number of children in the city between 5 and 15 years of age is 9,121. There are 91 public schools, divided as follows: 1 high, 8 grammar, 1 intermediate, 2 mixed, and 79 primary.

The following table gives the number of teachers, the average membership, attendance, etc., in the schools:

Schools.	Teachers.	Average membership.	Average attendance.	Per cent. of attendance.	Number to a teacher.	Average cost per scholar.
All schools	158	6,688	6,045	90.4	36.3	$19 70
High	10	316	300	94.9	31.6	29 81
Grammar	66	2,560	2,344	91.9	38.9	17 12
Intermediate	1	38	34	89.5	38.0	17 18
Mixed	2	52	45	86.5	26.0	23 43
Primary	79	3,722	3,322	89.3	47.1	10 96

There were 2 teachers for penmanship and drawing, and 24 assistants employed temporarily. There were 460 pupils in the several drawing classes, such as architectural, machine, design, etc. There were 5 evening schools, with a membership of 498. The total expenditure in 1880 was $135,692 86.

MANUFACTURES.

The following is a summary of the statistics of the manufactures of Lowell for 1880, being taken from tables prepared for the Tenth Census by Frederick Holton, special agent:

Mechanical and manufacturing industries.	No. of establishments.	Capital.	Average number of hands employed.			Total amount paid in wages during the year.	Value of materials.	Value of products.
			Males above 16 years.	Females above 15 years.	Children and youths.			
All industries	283	$20,465,192	9,218	9,503	1,318	$5,996,591	$16,315,062	$33,935,777
Belting and hose, leather	3	49,500	21	.....	.....	12,368	116,044	144,340
Blacksmithing (see also Wheelwrighting)	17	20,600	38	.....	.....	17,628	21,400	56,200
Boots and shoes, including custom work and repairing	10	10,750	34	5	.....	15,110	29,669	55,448
Boxes, wooden packing	3	72,000	55	.....	.....	22,900	88,430	128,800
Bread and other bakery products	4	53,500	35	3	4	21,530	147,600	196,065
Carpentering	17	159,500	281	.....	1	119,230	423,309	627,450
Carriages and wagons (see also Wheelwrighting)	4	56,000	33	.....	.....	16,655	24,040	56,611
Clothing, men's	5	35,500	14	45	.....	16,695	37,225	73,050
Confectionery	5	19,300	9	10	.....	7,987	41,760	66,976
Cotton goods	11	11,279,011	3,430	7,846	839	2,995,036	8,084,722	19,510,955
Dyeing and finishing textiles	4	3,000,000	777	120	70	413,733	1,063,324	1,993,751
Flouring- and grist-mill products	4	69,000	13	.....	.....	6,701	137,866	156,765
Foundery and machine-shop products	37	1,216,860	1,745	19	47	848,930	1,080,046	2,378,799
Furniture	4	24,000	38	.....	.....	15,886	23,205	51,235
Leather, tanned	3	50,000	44	.....	.....	19,423	241,659	288,452

Mechanical and manufacturing industries.	No. of establishments.	Capital.	Average number of hands employed.			Total amount paid in wages during the year.	Value of materials.	Value of products.
			Males above 16 years.	Females above 15 years.	Children and youths.			
Marble and stone work	9	$32,650	77	.....	.....	$35,813	$35,463	$99,860
Masonry, brick and stone	10	54,000	217	.....	.....	86,600	133,467	276,595
Painting and paperhanging	8	24,800	43	.....	.....	24,130	40,305	77,900
Patent medicines and compounds	3	278,000	144	61	5	116,200	261,300	550,000
Photographing	8	9,900	9	6	.....	5,295	4,675	20,697
Printing and publishing	6	90,000	122	12	42	64,905	43,014	153,432
Saddlery and harness	7	23,500	20	1	.....	9,263	15,175	34,693
Sash, doors, and blinds (see also Wood, turned and carved)	5	112,000	97	.....	3	42,336	76,089	143,141
Screws	3	18,500	19	.....	.....	8,250	11,550	26,600
Soap and candles	5	120,000	40	.....	.....	18,066	71,682	140,875
Tinware, copperware, and sheet-iron ware	8	68,600	55	.....	.....	26,171	55,225	101,480
Tobacco, cigars, and cigarettes	7	6,900	15	.....	.....	6,316	7,913	21,041
Watch and clock repairing	3	1,600	1	.....	.....	450	1,650	3,750
Wheelwrighting (see also Blacksmithing; Carriages and wagons)	5	4,850	8	.....	.....	3,800	5,175	12,105
Wood, turned and carved (see also Sash, doors, and blinds)	3	86,000	87	.....	12	31,040	39,860	87,420
Woolen goods (see also Worsted goods)	7	1,975,509	840	705	164	470,835	1,895,781	3,326,945
Worsted goods (see also Woolen goods)	7	634,862	240	486	99	191,727	1,005,625	1,367,320
All other industries (*a*)	48	808,000	617	184	32	304,982	1,050,514	1,706,126

a Embracing awnings and tents; ammunition; bookbinding and blank-book making; boxes, fancy and paper; brass castings; clothing, women's; coffins, burial cases, and undertakers' goods; coppersmithing; cutlery and edge tools; drain and sewer pipe; drugs and chemicals; dyeing and cleaning; felt goods; files; hosiery and knit goods; housefurnishing goods; iron bolts, nuts, washers, and rivets; iron pipe, wrought; iron work, architectural and ornamental; leather, curried; lumber, sawed; mattresses and spring beds; mineral and soda waters; mixed textiles; paper; paving materials; perfumery and cosmetics; plumbing and gasfitting; refrigerators; roofing and roofing materials; scales and balances; shipbuilding; shirts; stencils and brands; trunks and valises; upholstering; and wirework.

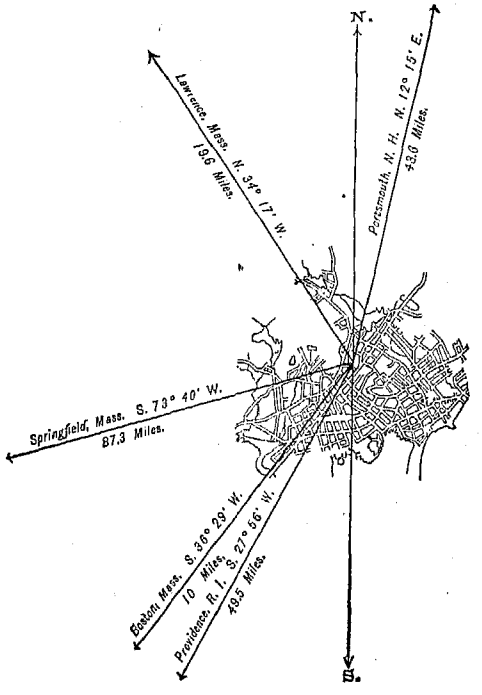
From the foregoing table it appears that the average capital of all establishments is $72,315 16; that the average wages of all hands employed is $299 24 per annum; that the average outlay in wages, in materials, and in interest (at 6 per cent.) on capital employed is $83,178 67.

LYNN,

ESSEX COUNTY, MASSACHUSETTS.

POPULATION IN THE AGGREGATE, 1790-1880.

	Inhab.
1790	2,291
1800	2,837
1810	4,087
1820	4,515
1830	6,138
1840	9,367
1850	14,257
1860	19,083
1870	28,233
1880	38,274



POPULATION BY SEX, NATIVITY, AND RACE, AT CENSUS OF 1880.

Male	18,243
Female	20,031
Native	31,234
Foreign-born	7,040
White	37,710
Colored	564

Latitude: 42° 27′ North; Longitude: 70° 57′ (west from Greenwich); **Altitude: 0 to 280 feet.**

FINANCIAL CONDITION:

Total Valuation: $22,487,864; per capita: $588 00. **Net Indebtedness:** $2,072,815; per capita: $54 16. **Tax per $100:** $1 62.

HISTORICAL SKETCH.(a)

The land now covered by the city of Lynn and the towns of Saugus, Swampscott, Nahant, and Lynnfield was first settled in 1629 by a party of five colonists and their families—about twenty all told—who had recently landed in Salem from England. The Indian name for this territory was *Saugus*—meaning "great", or "extended", and probably referred to the long beach—while the river on the west was called Abonsett, afterward changed to Saugus river. The colonists selected a plain, about half a mile in extent, in the eastern section, and built their houses. They purchased their land from the Indians, either as they wanted it or were able to secure it, and it was not until 1686 that a formal deed or quitclaim of all the lands was made to them by the original owners and filed

a From *History of Lynn*, by Linn and Hemphill.

with the colonial records. As Marblehead, Salem, and one or two other of the older towns all hastened to perfect their titles in the same way and at about the same time, it is supposed that the crown agents, under the direction of Governor Andros, had begun to inquire into the validity of the titles under which the several settlements held their lands. At this time the general court of Massachusetts consisted of the governor, deputy governor, twelve assistants or magistrates, and all who had obtained the privileges of freemen. The admission of freemen from a settlement was the same as an act of incorporation for their town, and Boston, Charlestown, and Salem were not otherwise incorporated than by seating their freemen in the general court. In 1634, however, a house of representatives was formed, and eight towns withdrew their freemen and were each represented by three members. In 1630, some fifty new settlers having come in that year, the freemen of Saugus were admitted to seats in the general court, and their town was thus incorporated under its original name, which it held until November, 1637, when the name was changed to *Linn*, gradually settling down to the present "Lynn".

The people of Lynn formed a strict farming community, and for many years appear to have lived in the most perfect democracy. They had town-meetings every three months for the regulation of their public affairs. They cut their wood in common, and drew lots for the grass in the meadows and marshes. Corn was the staple product at first, supplemented by barley, wheat, and flax. The first houses were rude structures, 18 feet square, 7-foot posts, with the roof steep enough to form a sleeping-room, and thatched with sedge and straw. Later better houses were built, with two stories in front, sloping down to one story in the rear, the upper story projecting about a foot, with very sharp gables. The frames were of heavy oak timbers, showing the beams inside. Burnt clam-shells were used for lime, and the walls were whitewashed.

For the first three years of its existence Lynn had no minister, some of the people attending church in Salem; but in 1632 a minister came to the settlement and a church was built, the fifth one erected in Massachusetts.

Iron ore, of the kind called "bog-iron", was discovered in Lynn at an early period. The great lack of all kinds of iron tools and wares in the colony induced several enterprising persons to attempt the establishment of a forge. Some specimen ore was sent to London, a company was formed, and a foundery was built on the west bank of the Saugus river, and work was begun in 1643. This foundery is believed to have been the first one erected in America. It continued in operation until 1688, when it was closed and further work was discontinued.

In 1692 Lynn had her share of the witchcraft persecution—that tidal-wave of superstition which swept over early New England—and some eight of her citizens were accused and imprisoned in Salem. Some were tried and acquitted, others, after a long confinement, were released without trial, and one was tried, condemned, and executed.

No remarkable changes ever took place in Lynn. She contributed liberally, in men and money, to the several French and Indian wars, and was prompt to respond on the breaking out of the Revolution, sending 168 men to fight for her country, 56 of whom never returned, 4 being killed at Lexington. The civic growth was slow, and, unless a single attempt to establish whaling (which failed in 1832) can be counted, the chief cause of her present prosperity is the shoe industry, which forms the principal occupation of a large number of her citizens. Shoes, in about the present form, came into use in 1633, and as early as 1635 two shoemakers came from England and settled in Lynn. The business gradually increased, keeping pace with the increase of inhabitants, while many of the farmers, after working in the fields during the summer, were accustomed to make shoes in their shops during the winter months. In 1750 John Adams Dagyr, a Welshman, gave great impetus and notoriety to the business by producing shoes equal to the best made in England, and from that time the craft may be said to have taken firm root as *the* industry of the town. All this time fathers, sons, journeymen, and apprentices worked together. The shops were small buildings, one story in height, 12 feet square, with a fireplace in one corner and a cutting-board in another. In 1768, according to the Boston papers, there were 80,000 pairs of shoes made in Lynn, and during the Revolutionary war large numbers of shoes were made here for the Continental army. For some time after the war, owing to the competition of English and French shoes, the industry languished, but in 1800 the manufacture of morocco leather was begun, and in 1810 it was estimated that 1,000,000 pairs of shoes were made in the town, valued at about $800,000, and of this amount some $50,000 was earned by women in binding. Large numbers of shoes were sent to the southern states at this time. After this the increase of this industry was steady, and the extent to which it has reached at the present time can be seen by a reference to the "manufactures" under the head of "Lynn in 1880" (see page 249).

Lynnfield, which had been granted to Lynn in 1639, and was known as Lynn End, was set off and incorporated as a town under its original name in 1814. The next year, 1815, another portion of Lynn was set off and incorporated as the town of Saugus. In 1852 Swampscott, and in 1853 Nahant, were taken from the parent town and incorporated as separate towns of the commonwealth. In 1850 the state legislature granted Lynn a city charter, which was accepted by the inhabitants on April 19, and the first city government under it was inaugurated May 14 of the same year. The commercial depressions of 1837, 1842, and 1857 were severely felt, and caused distress, but were well survived. No serious conflagrations or other calamities are recorded. The population was at first almost a pure English stock, increased only by the same and their own development; but latterly the force of manufactures has drawn large numbers of Irish here, and they now form a notable feature in all local affairs.

LYNN IN 1880.

The following statistical accounts, collected by the Census Office, indicate the present condition of Lynn:

LOCATION.

Lynn lies in latitude 42° 27′ north, longitude 70° 57′ west from Greenwich, on the north shore of Massachusetts bay, about 10 miles northeast from Boston. Its average altitude above mean sea-level is 50 to 60 feet, the lowest point being tide-water and the highest 280 feet above sea-level.

HARBOR.

Lynn harbor opens on Broad sound in Massachusetts bay; it is nearly half filled by flats, bare at low water, through which run numerous channels, whose depth is from 3 to 15 feet; they are wide enough for easy towage. Dockage is not ample, yet comfortable, and may be much increased. Great improvement has been made by dredging. Sensible currents issue from Saugus river and Chelsea creek on the west that might perhaps be utilized for scouring the channels. Open access is had westerly into Boston harbor, and eastward around Nahant to the ocean.

RAILROAD COMMUNICATIONS.

The Eastern railroad, from Boston to Portland, passes through the city, with branches to Saugus and Marblehead.

The Boston, Revere Beach, and Lynn railroad runs direct between Lynn and Boston.

TRIBUTARY COUNTRY.

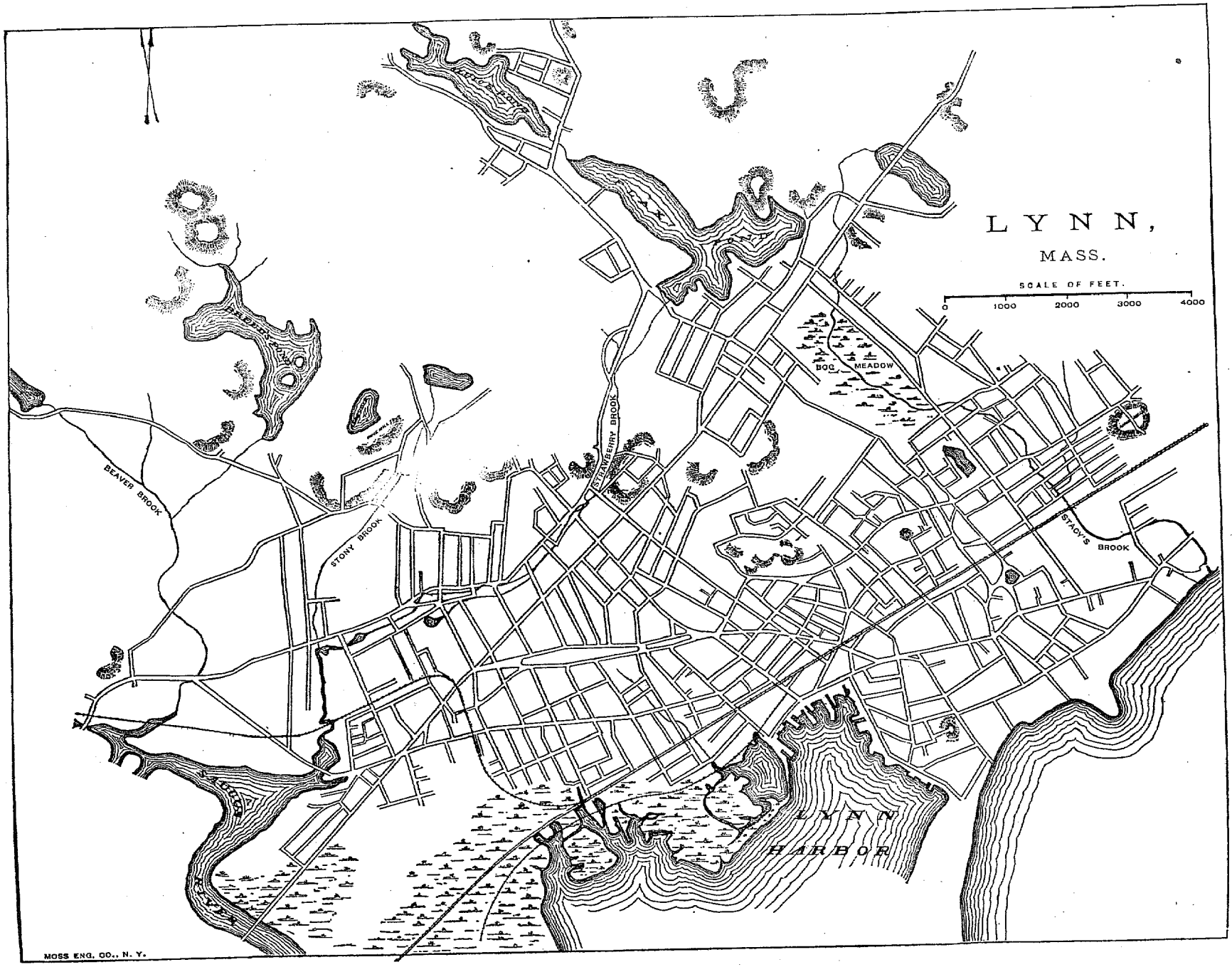
Lynn is backed by a district almost purely agricultural, from which she receives largely of the ordinary farm crops, especially of hay, milk, and fruit. In an industrial sense the city has little or no connection with the towns in her rear, save that, so far as they are also engaged in the shoe manufacture, they depend more or less on a supply of work from her. Commerce, strictly such, has little existence in the immediate region, and the only trade definitely enjoyed by Lynn is in the markets of Boston. There are a variety of small manufacturing enterprises in the rear towns, such as woolens, glue, paper, spices, and tobacco; but none of them have more than a casual connection with the city.

TOPOGRAPHY.

The portion of Lynn township occupied by the denser portion of the city is about 2 miles in breadth from the shore to the hills, and about 4 miles in length along the shore between the adjoining towns. The western half of this tract, resting westerly on Saugus river, is rather a low plain, of which nearly one-half toward the sea is a salt marsh covered at high water. The eastern half is of greater elevation. The rear division of the township is a tract of rough hills covered with woods. The soil everywhere is a gravelly loam approaching clay. Real clay is also abundant, but sand is scarce except on the beaches. The rock in the half of the territory nearest the sea is a dark-bluish felsite, passing into a purple porphyry, and thought to be of Huronian origin. North of the porphyry the rock is gray syenite, strongly metamorphic in the east, but more northerly becoming clearly hornblendic. On the west the porphyry becomes conglomerate. Differences in levels are only moderate, some sections being below high water, while the highest point is but 280 feet above sea-level. A few hills in the neighboring towns are slightly higher. Three natural ponds are found here, two others enlarged by art, and four entirely artificial. From two of the latter the city has a water-supply. Drainage is naturally had by Saugus river, and by Strawberry, Mowers, and Birch brooks, which flow into it, also by Stacy's brook, which enters the ocean at Swampscott.

CLIMATE.

Highest recorded summer temperature, 100°; highest summer temperature in average years, 99°. Lowest recorded winter temperature —14°; lowest winter temperature in average years —5°. The influence of the ocean tends to modify the heat of summer, and in winter often changes the snow to rain. The marshes are clean, are regularly mowed for the salt-hay crop, and give no perceptible sign of unwholesome vapor. The elevated lands break the force of the east winds, these winds losing most of their ill character by passing over the wooded hills. The east, northeast, and southeast winds are very damp and chilly, and are thought to aggravate all pulmonary complaints. The west winds are very dry; the northwest winds are always clear and cold; south and north winds are rare. Winds from the southwest are often violent, bringing rain within twelve or fifteen hours.


LYNN,
MASS.
SCALE OF FEET.
0
1000
2000
3000
4000
BOG MEADOW
STRAWBERRY BROOK
BEAVER BROOK
STONY BROOK
STACY'S BROOK
LYNN HARBOR
MOSS ENG. CO., N. Y.

STREETS.

Total length in the city, 89 miles. Of these, 4.50 miles are paved with broken stone and 84.50 miles are laid in gravel. The former costs $1 25 per square yard and the latter 70 cents. The broken stone is deemed much the cheapest in the end. Stone blocks are used only for crossings, but it is proposed, if a proper amount of money is appropriated, to lay a considerable amount of this class of pavement, as it is looked upon by the street commissioner as the best to be had. The sidewalks are almost wholly of brick and concrete—about equally divided. Curb-stones are generally of granite, 7 inches thick and from 13 to 18 inches deep. Gutters are uniformly laid with cobble-stones. Tree-planting along the sides of the streets is done quite commonly by the abutters in the dwelling-house parts of the city, and though it displaces the curbs and paving of the sidewalks, it is encouraged by the city. In the business portions, however, this is not allowed. The annual appropriation for streets is about $30,000 and for sidewalks $8,000. All street-work is done by the day, that class of labor being preferred. A steam stone-crusher is used, and is found to be indispensable.

HORSE-RAILROADS, ETC.

The Lynn and Boston horse-railroad to Boston has a total length, including sidings, of 14.5 miles; has 63 cars and 290 horses, and employs 122 men. During the past year 3,216,802 passengers were carried—an average of 42 for each round trip. The Lynn city horse-railroad has a total length, including sidings, of 2 miles; has 6 cars and 21 horses, and employs 7 men. During the past year 43,359 passengers were carried—an average of 28 for each round trip. There are two or three small omnibus lines running to the neighboring towns, but they are all owned and controlled outside of the city.

WATER-WORKS.

The water-works are owned by the city, and the total gross cost to December 31, 1880, is $1,008,390 32. Water is taken from two ponds within the city limits, and pumped into a distributing reservoir, the average head against the pumps being 166 feet. The average daily consumption of water is 1,238,289 gallons. Cost of raising 1,000,000 gallons 1 foot high, 5.36 cents; yearly cost of maintenance, aside from cost of pumping, $6,192 44; and yearly income from water-rates, $79,635 12. There are 57 miles of distributing-pipes connected with the works, including about 2 miles laid in Saugus and Swampscott, and 35 miles of service-pipe. There are 411 hydrants and 393 gates set. There are 121 meters in use. The whole number of services laid is 4,488, and the following fixtures are contained within the premises of water-takers: Faucets, 8,879; bath-tubs, 481; water-closets, 1,483; urinals, 38; hand-hose cocks, 1,047.

During the past year the water-supply from the ponds ran low, and to supplement this failing some twenty-eight tubular wells were sunk in various parts of the city, varying in depth from 31 to 69 feet, and yielding in the aggregate some 400,000 gallons daily. So far considerable objection has been made to these wells, principally on the grounds of the hardness of the water and the danger of the downward filtration of sewage; and the whole matter of the increase of the water-supply is still under discussion.

GAS.

No information on this subject was furnished.

PUBLIC BUILDINGS.

The city owns and occupies for municipal uses, wholly or in part, 1 city hall, 1 city farm, 33 school-houses, 4 engine- and hose-houses, and 1 city stable, the total value, including land, being $881,000. The city hall is owned entirely by the city, the county having no interest in it, and is valued, with the land, at $312,000.

PUBLIC PARKS AND PLEASURE-GROUNDS.

There is one park in the city, called the *Common*, situated near the center, with an area of 7.25 acres. The land was set apart for this purpose in the early settlement of the place, and has always been held by Lynn. It is very simply laid out in cross-walks, with trees, and the work on it has been done a little at a time. At present the yearly cost of maintenance is about $1,000. The ordinances prohibit any injury to trees, grass, or shrubs, hitching horses to the fence, entrance of dogs, etc., and the common is under the control of the committee on public grounds.

PLACES OF AMUSEMENT.

There are 2 theaters in the city—Music hall and the Academy of Music. The former pays $5 and the latter $3 for each performance, as city license, and in addition they are required to employ two policemen, at $1 each, for each performance, which really makes the license $7 and $5, respectively. Odd Fellows' hall and Buffum's hall are of moderate size, and are occasionally used for concerts, etc.

DRAINAGE.

The information received from this city gives no indication of the amount of work that has been constructed. It is accompanied by a project for the partial sewerage of the city, and the construction of a main outlet sewer, prepared by J. Herbert Shedd, civil engineer, in 1877. In this report, it is stated concerning previous drainage, that—

> Until 1866 the sewage and household water was drained into cesspools or discharged upon the surface. And indeed this may be said to be still the general practice, as less than one in twenty-four, or about 4 per cent., of the inhabited dwellings are connected with the public sewers. Two hundred and twenty-two dwellings, 117 factories, and 36 other buildings are recorded as so connected. Connections with the sewers were not at first recorded, but those of which there is no record are estimated at about 40.
>
> The total length of sewers in the city is about 7.42 miles. The Essex Street sewer and branches, having an aggregate length of about 0.70 mile, drain into Stacy's brook. The remainder, being about 6.72 miles, lie in the districts included in the proposed scheme of outfall, of which about 5.66 miles would be drained by gravitation.
>
> These sewers are gathered into five outlets. One of them, as already stated, is into Stacy's brook. Three are into the upper part of the harbor, between Beach street and the mill-pond, and one is upon the marsh-land opposite Shepard street. The three outlets into the harbor discharge much the larger portion of the offensive sewage.

The troubles experienced are thus described:

> At low-tide the harbor is nearly empty of water, and the large area of flats from the wharves to a line drawn from Pines point on Chelsea beach to Black rock in Nahant—having a length of say 1¼ mile, and a width of about a mile in the lower portion—is exposed, except in the channels, twice in twenty-four hours, in ordinary tides, to the influence of the sun and air. Upon these flats foul matter from the sewers and the streets accumulates and putrefies, and the air, laden with odors by this process, is often blown over the closely-inhabited portion of the city, and is disagreeably noticeable even in the higher and more distant sections. With so small a number of dwellings—only 222, as previously stated—draining into the sewers, it is evident that the nuisance which is experienced in the harbor is mainly owing to the refuse from factories, and to the filth that is washed from the surfaces of the streets. It can not arise from house-sewage alone. But whatever the source, if allowed to continue, it will in time become very offensive and dangerous to health.

On the same subject the committee on drainage say, in their report of November 1, 1877:

> During the summer, when the flats are uncovered and exposed to the heat of the sun, the odors arising from them are plainly noticeable to a great distance; the amount of sickness to be directly attributed to such a nuisance can not be estimated; but all authorities agree as to the dangerous character of these gases, and an abatement of this nuisance would improve the health of the whole city.

The leading feature of Mr. Shedd's project is a main sewer, with a cross-section of from 66 by 78 inches to 78 inches circular, and with a fall of from 1-to-400 to 1-to-2,000. This sewer would be entirely filled at high-tide for a distance of about 6,000 feet, and would carry dead water at high-tide for a distance of about 10,000 feet. The essential benefits contemplated in the construction of this outfall sewer have not yet been secured.

Such sewers as are now built are made to conform to the regular plan. It is stated that the ventilation of the sewers is effected "through a portion of the manholes by means of perforations in the covers and by private drains connected with chimney-flues and water-spouts".

Pipe-sewers running through wet land occasionally have the lower part of the joints uncemented for the admission of soil-water.

The mouths of sewers are submerged at high water. The final disposal of sewage is into the harbor, and largely over mud flats which are exposed at low-tide, creating much annoyance.

Three-fourths of the cost of construction is assessed upon abutters according to their frontage.

The average cost of 12-inch pipe sewers is $1 20 per foot, and of 24 by 36 inch sewers, $1 45 per foot. The average cost of each inlet-basin is $60, and that of manholes $42.

CEMETERIES.

There are 5 cemeteries and burial-grounds in Lynn, as follows:

Pine Grove Cemetery, owned by the city, and situated in the northerly suburbs, contains 104 acres.

Eastern Burial-ground is but little used.

Western Burial-ground is not used at all.

Saint Mary's and *Saint Joseph's Cemeteries*, in the northeast extremity of the city, are both owned by the Catholic church.

Since its establishment there have been 7,352 interments in Pine Grove cemetery. Permits for burial are issued to the undertaker by the city clerk on receiving a certificate of death from the attending physician; this permit is delivered to the superintendent of the cemetery. No limit of time after death for interment is stated, but between May and November no body can remain longer than thirty days in a vault. Graves must be at least 4½ feet deep. Pine Grove cemetery was purchased by the city in 1854 from a corporation, and is under the care of ten commissioners appointed by the city council. Lots vary in price from $250 to $200, which includes a payment for the care of the lot. The two Catholic cemeteries are managed and controlled by the Catholic church.

MARKETS.

There are no public or corporation markets in the city.

SANITARY AUTHORITY—BOARD OF HEALTH.

The chief sanitary authority of Lynn is the board of health, an independent organization, composed of the city physician, and two members appointed annually by the mayor and confirmed by the aldermen. It is not controlled by the city council, except in its appropriations, and takes its authority from the statutes. Its expense in 1880, its first year, was $14,040 03 for the removal of night-soil, ashes, rubbish, house-offal, and for cleaning catch-basins, etc. In case of an epidemic the city council would probably appropriate any necessary sum. In presence of an epidemic the board has authority to take all steps to check it. The chief executive officer is the clerk and agent, who receives $1,000 a year. He is the mouthpiece of the board, keeps the records, oversees the collection and removal of all night-soil, etc., and, with the city physician, who is chairman of the board, investigates all complaints. The board meets nearly every day. No assistant health officers or inspectors are employed. The board has supervision of defective house-drainage.

NUISANCES.

The practice of the board has been to inspect nuisances only when complaint is made. When the nuisance is reported it is inspected by the agent and the city physician, and proper notice to abate is sent to the owner or occupant. The same method is pursued in the inspection and correction of defective house-drainage, privy-vaults, cesspools, sources of drinking-water, etc. In case of defective sewerage, street-cleaning, etc., the board reports the matter to the proper branch of the city government, with its recommendations. The board has full control of the conservation of garbage, and, when the existing contract has expired, will have full control of its removal. No special regulations have been made as to the burial of the dead. The pollution of streams and harbors is forbidden, and the removal and disposal of excrement is directly controlled by the board.

INFECTIOUS DISEASES.

Small-pox patients are either quarantined at home, or removed to a pest-house on the city farm. So far, in cases of scarlet fever, the board has not interfered with the attending physician. Should contagious diseases break out in the public schools the board would co-operate with the school committee in taking proper measures. Vaccination is compulsory, and, where persons are unable to pay, is done at public expense. The registration of contagious diseases was begun in the present year (1880), the list including small-pox, typhoid and scarlet fevers, and diphtheria. All births and deaths are registered by the city clerk as registrar of vital statistics.

REPORTS.

The board makes an annual report to the city council, which is published with the other city documents.

MUNICIPAL CLEANSING.

Street-cleaning is done by the city with its own force, and wholly by hand labor. The streets in the center of the city are cleaned once in every two or three weeks; in outlying parts of the city, twice a year. No separate account of the expense is kept. The sweepings are used as filling.

Removal of garbage and ashes.—All garbage is removed by contractors, under the general oversight of the board of health. There are no special rules for its conservation pending removal. The contractors feed it to swine. The cost to the city is about $2,000 annually. The existing contract is unsatisfactory and will not be renewed. Ashes and rubbish are removed by the teams of the health department. They must be kept separate from garbage and in vessels convenient for removal. They are removed once a week. During the year, 6,672 loads were collected and deposited in various low places in the city. The cost of the work was $3,609 22.

Dead animals must be taken outside the city and buried. No record of this service is kept.

Liquid household wastes.—Chamber-slops and kitchen and laundry wastes are disposed of together, a small portion going into the public sewers, and both into vaults and cesspools; none into the street-gutters. The cesspools are porous, without overflows, very seldom receive the wastes from water-closets, and are cleaned under the orders of the board of health. The street-gutters are not flushed.

Human excreta.—Few of the houses are supplied with water-closets, which all empty into the sewers. Most depend on privy-vaults, which are mostly porous, though required by law to be tight. The vaults are emptied under the direction of the board of health by the odorless-excavator process. The night-soil is taken to the city farm, composted, and used as a fertilizer, but none is allowed on the gathering-ground of the water-supply.

Manufacturing wastes are mostly from the morocco factories, and are run into the sewers when liquid. What becomes of solid wastes is not stated.

POLICE.

The police force is appointed by the mayor with the approval of the aldermen, and is governed by the city marshal, subject to the orders of the committee on police, consisting of the mayor and two aldermen. The members of the force are appointed annually, and can be removed at any time for cause. The city marshal is the chief executive officer, and is responsible for the discipline of the force; his salary is $1,200 a year. The rest of the force consists of 1 deputy marshal, salary $1,000; 1 captain of police, salary $900; and 34 patrolmen, salary $800 each. The uniform is of dark-blue cloth, with police buttons. The men provide their own uniforms, at a cost of about $100 each. They are equipped with pistol, handcuffs, billy, duplex whistle, twisters, and a badge, and are on duty ten hours a day. The day officers are on duty from 7.30 a. m. to 6 p. m.; the night officers are in two reliefs—the first from 5.45 p. m. to 12.45 a. m., the second from 11.45 p. m. to 6.45 a. m. The interim in the morning is filled in turns by a detail from the second relief. All the streets are patrolled by the force. During 1880 the police made 1,431 arrests, the principal causes being drunkenness, assault, and larceny, most of the cases being disposed of by fines. The amount of property lost or stolen and reported to the police was $6,354 97, of which $2,106 10 was recovered and returned to the owners. The number of station-house lodgers during the same time was 1,432, against 1,757 in 1879. Lodgers are given coffee and crackers. The police must assist the fire department at fires, and the other departments when called upon. Special officers are appointed in the same manner as the regular force, and can be called upon for duty at any time. They receive 25 cents an hour for services actually rendered. The cost of the department in 1880 was $31,730 14.

FIRE DEPARTMENT.

The force consists of 1 chief and 4 assistant engineers; 1 superintendent of the fire-alarm; 2 steamer companies of 15 men each and 1 of 20 men; 1 chemical-engine company of 8 men; 2 hook-and-ladder companies of 15 men each; 1 hose company of 12 men; 1 relief engineer, and 1 relief driver—total, 108. The men are divided into a permanent and a call force. The superintendent of the fire-alarm, 1 engineer of the chemical engine, 3 engineers of steamers, and 10 drivers—15 in all—compose the permanent force. The remaining 93 are on call. The apparatus consists of 3 steam fire-engines in active service and 1 in reserve; 4 four-wheeled hose-carriages; 3 two-wheeled hose-carriages; 2 small hose-carriages; 2 jumper hose-carriages; 1 large double-reel two-horse pung; 2 small one-horse pungs; 1 large-sized four-wheeled double-tank chemical fire-extinguisher; 5 small fire-extinguishers; 2 hook-and-ladder trucks; and 3 wagons. The department owns 19 horses and 11,400 feet of hose, 600 feet being for the chemical engine. Water for fire purposes is taken from 411 hydrants, 19 reservoirs, 15 wells, and 4 ponds. The reservoirs have an aggregate capacity of over 430,000 gallons. The fire-alarm telegraph has 37 street-boxes. There were 107 fires and alarms during the year. The loss by fire was $120,185 33; the amount of insurance that has been paid, $56,744 33; and the whole amount of insurance on buildings and stock was $558,125.

PUBLIC SCHOOLS.

There are in Lynn 31 school-houses, divided into 1 high, 7 grammar, 23 primary, and 1 evening school-houses. There are 64 schools: 1 high, 7 grammar, 55 primary, and 1 evening school for drawing. The whole number of teachers, including music, drawing, and penmanship teachers, is 115. The total expense for schools in 1880 was $85,008 28. The following table shows the attendance in the public schools during the past year:

Schools.	WINTER TERM.				SPRING TERM.				FALL TERM.				Average daily attendance for the year.	Average number of pupils to each teacher.
	Number enrolled.	Number belonging.	Average daily attendance.	Per cent. of attendance.	Number enrolled.	Number belonging.	Average daily attendance.	Per cent. of attendance.	Number enrolled.	Number belonging.	Average daily attendance.	Per cent. of attendance.		
All schools..	5,696	5,226	4,407	84	6,003	5,386	4,723	88	6,279	5,776	5,061	88	4,730.33	.....
High	151	140	145	97	141	139	136	98	254	245	240	98	173.66	38
Grammar.....	2,475	2,310	2,062	89	2,389	2,218	2,086	94	2,773	2,580	2,399	93	2,182.33	55
Primary	3,070	2,767	2,200	80	3,473	3,029	2,501	83	3,252	2,951	2,422	82	2,374.33	53

The evening drawing-school has but 58 sessions and 125 pupils; the average number belonging is 100, and the average attendance 75.

MANUFACTURES.

The following is a summary of the statistics of the manufactures of Lynn for 1880, being taken from tables prepared for the Tenth Census by C. M. Merritt, special agent:

Mechanical and manufacturing industries.	No. of establishments.	Capital.	Average number of hands employed.			Total amount paid in wages during the year.	Value of materials.	Value of products.
			Males above 16 years.	Females above 15 years.	Children and youths			
All industries	343	$5,894,575	8,894	3,489	37	$5,833,849	$17,433,455	$26,828,023
Blacking	7	10,200	12	.....	.....	7,480	28,350	42,808
Blacksmithing (see also Wheelwrighting)	12	8,100	26	.....	.....	15,220	10,425	36,200
Boot and shoe cut stock	35	605,400	284	68	1	204,040	3,198,200	3,754,500
Boot and shoe findings	12	65,500	85	40	10	59,600	105,400	209,700
Boots and shoes, including custom-work and repairing	125	3,595,800	6,915	3,274	13	4,685,017	9,847,971	16,979,432
Boxes, fancy and paper	4	22,000	35	78	.....	45,750	48,000	123,500
Bread and other bakery products	6	39,100	53	2	1	26,162	70,150	124,000
Brick and tile	3	19,000	39	.....	.....	9,100	11,550	26,000
Carpentering	15	36,600	142	.....	.....	79,500	213,900	375,500
Carriages and wagons (see also Wheelwrighting)	6	35,000	51	.....	.....	31,430	53,490	103,500
Foundery and machine-shop products	9	76,000	97	.....	.....	51,400	53,200	144,850
Lasts	5	20,000	25	.....	.....	17,750	8,400	44,500
Leather, curried	19	474,650	421	5	2	230,310	1,905,077	2,283,672
Leather, tanned	18	436,650	318	.....	4	170,908	1,375,073	1,669,087
Marble and stone work	4	6,200	19	.....	.....	8,465	9,524	22,789
Needles and pins	3	28,000	31	1	.....	21,000	41,800	72,500
Painting and paperhanging	7	8,300	32	.....	.....	17,659	19,605	46,329
Plumbing and gasfitting	4	23,800	65	.....	.....	20,360	47,400	85,000
Saddlery and harness	3	8,000	12	.....	.....	5,600	8,700	21,000
Shipbuilding	3	925	3	.....	.....	1,200	560	1,993
Tinware, copperware, and sheet-iron ware	4	10,500	16	.....	.....	9,400	16,500	37,200
Wheelwrighting (see also Blacksmithing; Carriages and wagons)	3	700	4	.....	.....	2,100	1,070	5,500
Wood, turned and carved	4	30,000	36	4	.....	18,600	18,200	44,400
All other industries (a)	32	334,150	173	8	6	95,798	340,400	567,063

a Embracing bookbinding and blank-book making; boxes, wooden packing; carriage and wagon materials; confectionery; cutlery and edge tools; engraving and die-sinking; fertilizers; flouring- and grist-mill products; furniture; glue; grindstones; iron nails and spikes, cut and wrought; iron railing, wrought; kindling-wood; lumber, sawed; masonry, brick and stone; mineral and soda waters; patent medicines and compounds; sash, doors, and blinds; slaughtering and meat packing; soap and candles; tobacco, cigars, and cigarettes; and upholstering materials.

From the foregoing table it appears that the average capital of all establishments is $17,185 35; that the average wages of all hands employed is $469 71 per annum; that the average outlay in wages, in materials, and in interest (at 6 per cent.) on capital employed is $68,865 82.