

THE MIDDLE STATES.

NEW YORK.

ALBANY,
AUBURN,
BINGHAMTON,
BROOKLYN,
BUFFALO,

COHOES,
ELMIRA,
KINGSTON,
LOCKPORT,
NEWBURG,

NEW YORK AND THE ME-
TROPOLIS,
OGDENSBURG,
OSWEGO,
POUGHKEEPSIE,

ROCHESTER,
ROME,
SCHENECTADY,
SYRACUSE,

TROY,
UTICA,
WATERTOWN,
YONKERS.

NEW JERSEY.

ATLANTIC CITY,
CAMDEN,

ELIZABETH,
HOBOKEN,

JERSEY CITY,
NEWARK,

NEW BRUNSWICK,
ORANGE,

PATERSON,
TRENTON.

PENNSYLVANIA.

ALLEGHENY,
ALLENTOWN,
ALTOONA,
CHESTER,

EASTON,
ERIE,
HARRISBURG,
LANCASTER,

NORRISTOWN,
PHILADELPHIA,
PITTSBURGH,

POTTSVILLE,
READING,
SCRANTON,

WILKESBARRE,
WILLIAMSPORT,
YORK.

DELAWARE.

WILMINGTON.

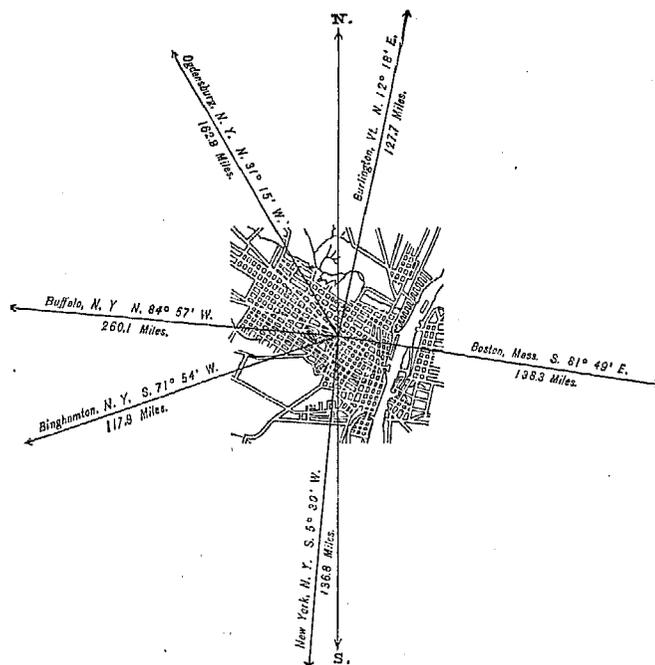
NEW YORK.

ALBANY, ALBANY COUNTY, NEW YORK.

POPULATION

IN THE
AGGREGATE,
1800—1880.

	Inhab.
1790.....	.....
1800.....	5,349
1810.....	10,762
1820.....	12,630
1830.....	24,209
1840.....	33,721
1850.....	50,763
1860.....	62,367
1870.....	69,422
1880.....	90,758



POPULATION

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

Male.....	43,770
Female.....	46,988
Native.....	66,993
Foreign-born.....	23,765
White.....	89,694
Colored.....	* 1,064

* Including 3 Chinese and 5 Indians.

Latitude: 42° 40' North; Longitude: 73° 45' (west from Greenwich); Altitude: 246 to 301 feet.

FINANCIAL CONDITION:

Total Valuation: \$33,746,992; per capita: \$372 00. Net Indebtedness: \$3,683,765; per capita: \$40 59. Tax per \$100: \$3 03.

HISTORICAL SKETCH.(a)

The earliest record of a visit of Europeans to the present site of the city of Albany is contained in the account of Henry Hudson's trip in September, 1609, upon the river which bears his name. Hudson, who was in the employ of the Dutch East India Company, sailed from Amsterdam March 20, 1609 (O. S.), in command of the

^a Mr. Desmond S. Lamb, of Albany, not only secured all the detailed information regarding Albany in 1880, but also provided the historical sketch of the city which introduces this report.

yacht "Half Moon", with a crew of about twenty Dutch and English sailors, their purpose being the long-sought Northwest passage to India. The yacht terminated its upward trip on the river at a point half a mile below what is now the city, and a portion of the crew continued in a small boat to the site of the present city of Troy. Finding the water very shallow at these points, they abandoned further investigations and returned to England, where Hudson, who was an Englishman, was retained by the government, while the "Half Moon" returned to Holland. The account published concerning their adventures resulted in a cruise by another Dutch party, who found the site of Albany available as a depot for trade in furs and traffic with the Indians.

On application to the home authorities, a number of these adventurous men obtained a special grant giving them exclusive privileges for four voyages, and imposing heavy penalties for any infringement of their right under the grant. In pursuance of its authority a block-house was erected on an island just below the present city, in the year 1614. A freshet during the spring of 1618 caused the abandonment of this fort, and the construction of another in the following summer on the banks of what is now known as the Normanskill creek, a quarter of a mile south of the present corporate limit. The first name of the settlement is said to have been "Aurania", but this is unsupported by reliable authority.

In the year 1623 the name "Beverwyck", which it had held for nine years, was changed to "Fort Orange", and a fortified fort was built at a point now in the heart of the city. By charter of 1629 and purchase in 1637, the Van Rensselaer family became proprietors of a tract of land 24 miles square, including the settlement. The descendants of this family still remain large landed proprietors in the city, and have earned an enviable name in the annals of the country. The head of the family was always known as the patroon. The first of the name undertook by authority the management of all the affairs of the colony, and introduced many curious regulations, which, though to-day some seem harsh and tyrannical, effectually prevented disorder, and insured fair dealing and harmony among the colonists.

In the year 1642 Van Rensselaer sent out Rev. Johannes Megopolensis under an agreement to pay him a regular stipend for the performance of his ministerial functions; and through his efforts was erected, in the latter part of 1643, the first church of the settlement. Under the guidance of its pastor this church became so flourishing that in 1647 it loaned 300 guilders to the patroon to advance his interests in the colony. In the earlier years the population, which was wholly Dutch, comprised freemen who, at their own expense, immigrated and engaged in trade, and servants and farm hands sent out by Van Rensselaer to cultivate his grounds. At this time most of the houses were frame structures with roofs of reed or straw and chimneys of wood. They rarely exceeded a single story in height. Here and there were erected wind- and water-mills to grind corn and saw lumber. Every thing was of the rudest construction. All business was conducted on principles of barter, and market values were fixed in kind, owing to the dearth of money. The fur trade, which was the staple business of the colonists, flourished in a remarkable degree, and frequent arrivals from the old country gave the settlement increased prosperity. In 1646 a new stockade was built on an eminence some distance back of the river, and the settlement around it took the name of "Willemstadt", by which in time the whole colony came to be known. The enterprising Hollanders pushed out in all directions from Fort Orange in search of trade, and one branch of the traders came in conflict with the English in Connecticut. This resulted in war, and August 27, 1664, a settlement was effected by which the colony and other lands of the Dutch were ceded to the English.

At the time of this cession the name of "Albany" was given to the several hamlets that clustered at this point, in honor of the king's brother, later James II, but then the Duke of York and Albany, who became land proprietor of the domain. The inhabitants were offered permission to remain under the protection of the English and were confirmed in the possession of their former privileges. The majority resolved to stay, and their descendants are numerous in New York and Albany. On the 22d of July, 1686, Thomas Dougan, the governor of the province, granted to Albany a city charter, the original of which is still preserved in the mayor's office in Albany. At this time, and for some years later, the records of the settlement continued to be written in Dutch, and most of them are on file in Albany in the offices of the secretary of state, the county clerk, and the clerk of the common council. They have never been translated. Albany is the second oldest colony and the first chartered city in the thirteen original colonies, the charter of New York city having been granted some days later, and the Jamestown colony having been first settled in 1607.

About the year 1685, the arrival of a number of French Protestants added much to the wealth of the colony, and soon after came several families of Scotch immigrants, adding new life to the place. Notwithstanding the influx of these and later immigrants, Albany retained for many years the unmistakable evidences of its Dutch origin. The early settlers and their descendants were jealously inclined toward all newcomers, and, while giving no evidences of active discourtesy or dislike, kept carefully aloof from all association with them. The dwellings were counterparts of the old Holland houses, nearly all of them built of bricks imported from the old country for the purpose. The gable-end faced the street, and the front center was devoted to a large wooden stoop upon which the family used to gather on pleasant evenings. In Holland the water-spouts projected over the sidewalks so as to convey the drippings from the roofs into the canals. Here the same custom was followed, regardless of the absence of canals, and resulted in constant muddy walks and unclean streets. Up to the period of the English accession the records of the settlement are plain and direct. Thenceforth the changes came about so rapidly that

it is difficult for many years to trace them with certainty. The immigration that set in soon after resulted in a mixed population, comprising nearly all the prominent nationalities of Europe. There was less of national habit or custom to be distinguished, except among the Dutch, who still stood apart, religiously preserving their own peculiar and exclusive customs. These latter gave the family names to the hamlets, settlements, mountains, rivers, streams, and gullies of the neighborhood, and many of these still remain.

The disputes between the English and French governments, ending in the war beginning March, 1744, were reflected between the settlers of the different nationalities, both sides using the Indians. During these troubled times Albany was a scene of great activity, and June 14, 1764, a general congress of the colonies was assembled at Albany and a satisfactory treaty was made with the Indians. In 1746 Albany was visited by an epidemic of yellow fever which carried off 45 of its inhabitants—nearly 2 per cent. of the population. At the time of which we write the city was unpretentious from an architectural point of view. The principal street ran westward from the river, and the entire place was stockaded as a protection against the sudden incursions of the Indians. In proportion to its population Albany occupied a large expanse of territory, gardens were attached to many houses, and trees were planted in profusion. In no respect had the people given regard to regular or orderly appearance. Every thing that grew or was built seemed the result of momentary caprice. Every family possessed a cow, and these were pastured in a common herd at the southern limit of the place, and made their way to and fro morning and evening as their fancy dictated. These animals and their notion of passage, together with indirect lines of the stockade, are responsible for the wretched irregularity of many of the streets which excites the attention of every observing visitor. At the southern portion of the city was a fertile spot which provided corn and vegetables sufficient for the community. This, and a large adjoining tract which was granted by Governor Dougan in 1688 to the Reformed Dutch church, and was known and is still recognized as the "church pasture", was divided into lots and sold in 1791, the several streets passing through it being named after the principal ministers of the church. Many of these names are still retained, and the memory of the old times is further preserved through a system of quit-rents, which were reserved in the first conveyances and in many instances are yet paid by the present owners of the lots. The slaves, of which each family possessed a limited number, were treated with uniform kindness and were devotedly attached to their masters. The government of the city was still in the hands of the old Dutch families, who were in many respects the most prominent citizens.

Municipal affairs were conducted with rigid honesty, scrupulous exactitude, and, as the records attest, with undeviating regularity, with the single exception of the years 1776 and 1777, when, by reason of the universal agitation incident to the Revolution, almost every branch of government and of industry was seriously disturbed. During this period the affairs of the city seem to have been administered by a committee of safety, none of the regular city officers having been elected in conformity with the law. In February, 1778, the legislature, whose attention was called to the matter, legalized the official acts of those who had assumed the functions of the several municipal posts, and with the next elections the regularity returned. From the suspension of hostilities the city grew rapidly in wealth and prosperity, added largely to its population by miscellaneous immigration, the general character of its buildings changed, and a new spirit of enterprise crept in, to the bewilderment of the old Dutch burghers, who regarded these evidences of improvement with ill-concealed feelings of astonishment and annoyance.

The first printing-office was opened by the Robertson Brothers, who soon began to publish the *Gazette*; but as they joined the *Royalist* in 1778, the paper was not put on a firm basis until taken by Messrs. Balentine and Webster, under whom and their successors it was continued until 1845. During the latter part of the eighteenth century the spirit of enterprise which first discovered Albany as an available basis of trade gave to it a commercial interest that is little appreciated by the present population. Sloops and other sailing-vessels were sent from this point, and carried on an extensive trade not only with the people of the colonies, but with the distant West Indies; and in the fall of 1785 Steward Dean, a citizen of Albany, fitted out the sloop "Experiment" and began the first of a number of successful voyages to China. The Bank of Albany, the first institution of its kind in the city, the second in the state, and the fourth in the republic, came into existence April 10, 1792, and continued until the breaking out of the civil war. Its business grew rapidly, and incited other enterprises of like character which, in spite of its efforts, were soon established and conducted a prosperous business. The first severe drawback occurred November 17, 1793, through a fire caused by an incendiary, who, with his accomplices, was found guilty and executed. In 1786 Albany contained 550 houses and about 4,000 people. There were nine streets, upon the three principal of which, running loosely parallel with the river, most of the buildings were erected. All the peoples of Europe were represented in the population, many of whom were chiefly influenced in settling here by its advantages as a center of trade.

The Dutch language, spoken exclusively previous to the Revolution and employed in all public business and records, afterward fell into disuse, the English tongue taking its place. There were 4 churches, a hospital, and a city hall, all of unpretentious appearance. In a decade thence the population reached 5,000, with 1,200 houses. On February 14, 1797, a bill passed both houses of the legislature providing for the erection of a public building to be used as a capitol; and on its completion, in 1807, Albany became fixed as the capital of the state. Previous to this time the city hall had been used for legislative purposes. The latter, known as the "Stadt Huis", was located on the corner of Broadway and Hudson avenue, and the commercial building which now occupies the site bears on its façade a

stone tablet commemorating the spot where the Declaration of Independence was first read in Albany. The old capitol of red sandstone bears on its face the ravages of time, and is about to be razed for the approaches of its successor, which stands eminent for grandeur of conception and detail. In 1795 the city was partially lighted by oil, apparently by concerted action of individual citizens. Gas was first used privately in 1841, when the Albany Gas Light Company was incorporated, and was introduced on the public streets November 10, 1845. The act of the legislature, April 7, 1795, making appropriations, among others, to Albany county for the maintenance of public schools, was the foundation of the public-school system. August 4, 1797, occurred an extensive conflagration, destroying nearly 100 dwellings and leaving 1,000 persons homeless. It began in the heart of the city and proved the severest calamity in its history. The site was soon rebuilt with modernized structures which greatly improved the appearance of the place. Up to 1790 there was no street pavement, a fact that caused much inconvenience and severe criticisms from visitors. Some years later, after a thorough canvass of the subject and in the face of a determined opposition, it was decided to pave State street, the principal avenue in the city. This was done with cobble-stones, which abound in the neighborhood and are principally used as pavement throughout the city. Toward the close of the century the neighboring farm-lands had been developed—a new source of wealth to the city. Owing to the settlement in the West and North, the Indian trade fell off in some degree; but with its agricultural resources the city grew rapidly in importance and stability. Manufactures were established and met with success, the water-power furnished by neighboring streams being admirably calculated for such purposes. The fires already mentioned largely effaced the vestiges of early days and destroyed wholly or in part the tottering remnant of the old stockades, leaving but one of the six block houses; and this was swept away by fire in the summer of 1812.

The most remarkable incident marking the opening of the nineteenth century in its relation to Albany, if not to the entire world, was the successful voyage of Robert Fulton from New York to Albany in the "Clermont", a vessel propelled by steam. Watt had but a short time previously got his steam-engine into practical operation, and Fulton, who had watched his progress with unbounded interest, prepared a vessel under the assistance and encouragement of Chancellor Livingston, and started up the Hudson river from New York on Friday, September 4, 1807. The northern terminus of his trip was a point now known and used as the steamboat-landing, and the passage occupied thirty-six hours. The news of success spread like wildfire, and was the initiatory step in the steamboat system of the world. The vessel, which took its name from Livingston's country-seat on the Hudson, was constructed in every detail under the personal inspection of Fulton. Its length was 130 feet; breadth, 16 feet; depth of hold, 7 feet; and its engine was built especially for it by the famous English firm of Watt and Bolton. Wood was used as fuel, at a cost of \$150 a trip, but soon the introduction of Lackawanna coal reduced the expense 80 per cent. This reduction gave a wonderful impetus to steamboating throughout the country.

The project of a canal to unite the waters of the great lakes and the ocean, which had long been agitated, took definite form in March, 1810, when a legislative commission of seven, of which Mr. Stephen Van Rensselaer, a leading citizen of Albany, was a prominent member, was appointed. A favorable report was made in February, 1811. It was at first proposed to ask national aid, but it was finally determined to confine the honor of the work to New York state, and in March, 1812, the legislature was induced to appropriate \$500,000 to the enterprise. The war with Great Britain prevented further action until 1816, when the legislature re-authorized the work, which was accordingly begun and pushed to completion with amazing rapidity, Governor De Witt Clinton being its strongest supporter. During the same year the Champlain and Northern canal, similarly authorized, was in progress, and, both having their southern terminus at Albany, were completed within a few days of each other, the latter being opened for business September 10 and the former October 8, 1823. On the latter day a great celebration was held commemorative of the importance of the work just completed to Albany, New York state, and the whole Union. A basin was constructed at Albany as a protection to boats awaiting lockage. Accordingly, April 5, 1823, the legislature authorized the work and appointed a commission for its prosecution. A pier was erected about 200 feet out from the river-dock, running about parallel with the channel, leaving an open space at either end to be connected by bridges with the shore. These bridges, together with a sloop-lock and a draw-bridge at the south end, were to be open and free to the public. The pier, which covered 8 acres of land, was opened in May, 1825. The expense of the work was borne by private subscription among the citizens of Albany, who were reimbursed by the sale of pier-lots, which realized \$70,000 in excess of the cost. The pier when completed was 4,400 feet long, 80 feet wide, and 20 feet high, the inclosed basin covering 23 acres. In March, 1836, the common council petitioned the legislature for permission to open a space in the center of the piers to facilitate the admission of river craft; this was granted. The passage was enlarged successively in 1841 and 1849 until it was 192 feet broad, giving every accommodation for the passage of vessels. The inclosed basin was ample and commodious, and gave to Albany a triple dock-front. It is now mainly used as a winter harbor for local craft. In 1831 the first railway train was run from Albany to Schenectady, and with the impetus soon given to such enterprises Albany became a point of much importance.

For many years the lines were limited in extent and disconnected; but the consolidation of these fragments of road, and the advances made by the system to the farthest recesses of the state, added largely to the interests of the city. During these years all freight had to be transhipped at Albany, as there were no bridges across the river; but on the consolidation of the New York Central and the Hudson River railroads the efforts to obtain a bridge

triumphed over all interested opposition, and in February, 1866, the first bridge was opened. This was followed by another in 1872. Both are now of iron, the first wooden structure having been rebuilt, and the present one is now used exclusively for freight. With the advent of these bridges the local industry of transshipment passed away, and the pier, with most of its dock property, became of little value.

The population had reached 24,209 in 1830, doubling in the decade from 1820 to 1830. Except during the war of 1812, advance in prosperity was made with amazing strides. It is of record that two years after the opening of the canal the wholesale trade of the city quadrupled, and local merchants opened direct communication with European manufacturers. The only serious impediments to this communication are the "oversloughs", ridges of land, occurring twice in the channel within 10 miles of the city. Repeated but unavailing efforts have been made to remove them, and to-day they are a source of serious annoyance and delay. The canals opened up a tremendous wooded district, and made Albany one of the most important lumber markets in the country. The lumber district of the city to-day lying between the Erie canal and the Hudson contains nearly 150 acres, and the annual sales exceed those of any city except Chicago.

The Albany boys' academy was projected in 1813, and met with such success that a similar institution for girls was erected eight years later. The former building is of red sandstone, and faces Academy park. Here it was that Professor Henry put in practical working shape by means of a mile of iron wire—for the first time, as it is claimed—the now indispensable telegraph. In 1814 a normal school under the state system was erected for the preparation of teachers for the public schools. In 1852 the project of advanced educational facilities began to be discussed, and resulted in the medical and law college of the city, and the construction of the Dudley astronomical observatory, all of which have been incorporated in the Union university, which also embraces the famous Union college of Schenectady, founded in 1795, and so named because in its erection was represented a union of all religious creeds. The observatory was the direct result of the munificence of Mrs. Blandina Dudley, who contributed \$80,000 toward its erection and maintenance. It was named in honor of her husband, a distinguished and public-spirited citizen, who in life had devoted much of his leisure to astronomical subjects. It was incorporated in 1853 and completed in 1856, and is built in the form of a cross. Its telescope is said in completeness of workmanship and appliances to surpass any other in the country.

One of the quaint features of old Albany was the stage-coach. For many years before the introduction of railways, stage-coaching was a chief industry. Up to 1830 the streets were almost constantly filled with the coaches, one starting, it was said, at every hour of the day and night. The business received a check with the introduction of steam- and canal-boats, and the railroad innovation completed the destruction of the industry, which languished until the introduction of horse-cars in 1863, since which time no stage-coach has been seen on the streets of Albany. The cattle market at West Albany enjoys an extended reputation. Millions of dollars change hands there annually, business being conducted on an absolute cash basis. In 1855 the New York Central railroad, recognizing the advantages of such a project, purchased a large area, which was set apart for this purpose. Enterprising local capitalists continued the work, which has now grown to colossal proportions, and more than justified the first conception of the plan. Albany had for nearly half a century before been prominent as a cattle center, but the introduction of railways gave the enterprise such an impetus that in 1840 the city boasted with truth of packing more beef than any other point in the Union.

Albany has always been a leading barley market, and for many years was pre-eminent. Indeed, the earliest chronicles relating to barley and brewing reach back as far as 1632. Its ales have achieved a world-wide distinction, and its reputation in the manufacture of most liquors is unsurpassed. The cholera visitation in 1832 bore away 400 of the people of Albany and created unexampled consternation in the community. In August, 1848, occurred the most considerable fire that ever came upon the city. Nearly one-half of the business portion was consumed, and the rest was saved only by ceaseless efforts. Many persons were killed, others seriously injured, while millions of dollars' worth of property was completely destroyed. The panics of 1857 and 1873 that affected the financial world were felt with severe force in Albany.

At the opening of the civil war Albany became a center of military activity, furnished a large proportion of volunteers, including some of the foremost men, and aided generally in every patriotic movement. The sanitary bazaar of 1864, held in the Academy park, for the benefit of sick and wounded soldiers at the front, will long be remembered with pleasant associations, and as having raised thousands of dollars for its noble purpose.

Some of the antiquities of Albany that yet remain are the state-house and Pemberton building, both conspicuous in the center of the city. The former was erected in 1667, the latter in 1710. At present Albany is growing rapidly in wealth and importance. From its rail and water facilities it has become a large manufacturing center. Iron, stoves, shoes, ales, porter, and German beers, agricultural implements, musical instruments, and carriages are extensively produced, each holding a superior reputation and furnishing employment to hundreds of workmen.

A new city hall is in progress of erection to replace that burned February 10, 1880. In the city are held sessions of all state and federal courts. The penitentiary, a model of its kind and world-famous, is finely situated on a knoll in the western section of the city surrounded by beautiful and extensive grounds.

There are 12 banking institutions, 2 hospitals, 3 morning and 3 evening papers, 2 German papers, 4 weekly journals, and 2 monthly periodicals in the city. The municipal government is in the hands of a mayor and 17 aldermen, elected biennially by the people.

The mayor holds a veto power over all acts of the common council, and has the appointment, subject to its approval, of all heads of departments. The bureaus for the conduct of city affairs consist of the chamberlain's bureau and the bureau of taxes, the boards of health, contract, and appointment, finance department, lamps and gas, law department, almshouse, and public buildings and parks. The departments of police and fire are in charge of separate commissions, the officials in the former elected by the people, in the latter appointed by the common council. The traditional stolidity of the early Dutch, which has even in late years been seriously felt, is rapidly passing away; and while Albany can not be regarded as promising at any time to be a great city, there is much reason to believe that it has not yet reached the limit of its capacity as a prosperous commercial and manufacturing center.

ALBANY IN 1880.

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

LOCATION.

Albany is situated in latitude $42^{\circ} 40'$ north, and longitude $73^{\circ} 45'$ west from Greenwich, on the west bank of the Hudson river, about 144 miles north of the city of New York. The lowest point is 2.46 feet above the mean tide-water level at Governor's island, New York harbor; while Prospect hill, its highest point, rises 301 feet above mean low water. The general level throughout the city, which has a very diversified surface, on a level parallel with the Hudson, and passing through Prospect hill, is from 225 to 275 feet. The city is on navigable water 5.75 miles below the head of navigation on the Hudson. The mean rise and fall of the tide is 2.32 feet. The draught of water is 9 feet at mean tide-water in the harbor, while in the channel the depth varies from 9 to 14 feet. The tidal current at a point about 2 miles below the city is about 1.51 feet per second in the channel, and about 0.73 foot through the river. The Hudson furnishes communication by water with New York city and intermediate points. The Erie and Champlain canals furnish water transportation to Buffalo and lake Champlain.

RAILROAD COMMUNICATIONS.

The Boston and Albany railroad connects the city with Boston, 200 miles to the east.

The Rensselaer and Saratoga railroad connects it with Saratoga; this road is leased to the Delaware and Hudson Canal Company.

The Albany and Susquehanna railroad, termini Albany and Binghamton, is also leased by the Delaware and Hudson Canal Company.

The Delaware and Hudson Canal Company, largely interested in the development of its Pennsylvania coal mines, leased these two roads and opened a continuous line to Rouse's Point, where it connects with the Grand Trunk railway of Canada, thus affording a direct line to Montreal.

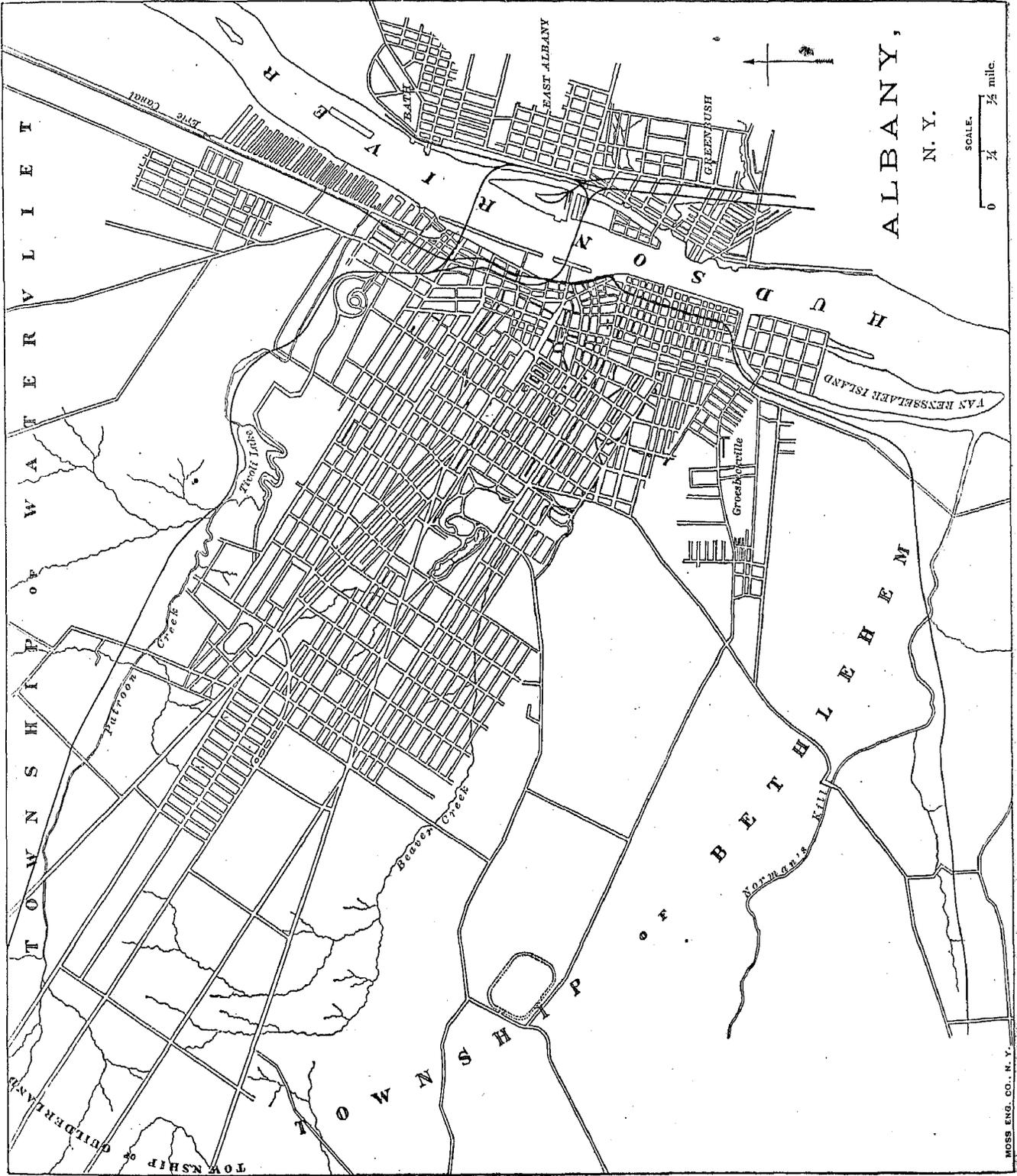
The New York Central and Hudson River railroad makes Albany a connecting line between New York city and Buffalo and the West.

TRIBUTARY COUNTRY.

The country to the east, west, and south is very fertile, while in a northerly direction there is much timber, although the soil, except at intervals, is not adapted to agriculture. For all this section, except to the east, Albany is the market center; but, owing to poor facilities for crossing the river, the eastern trade goes principally to Troy. Albany is a great stove mart, and has lately become a center of shoe manufactures, while it has long been noted for its superior ales. The commercial features of the city have increased by an infusion of foreign enterprises within the past fifteen years.

TOPOGRAPHY.

The surrounding country is varied and broken. Except along the river-bank for an average extent of about 300 feet immediately west, Albany is a series of hills constantly rising to the west, and broken by ravines. The city proper is built mainly on three elevations extending eastward and downward to the river-front, and divided by ravines, one of which is so gradual as to admit of building throughout, while the southerly side of the northern ravine is so steep as to preclude building. To the north and south are two ravines of rapid descent which perhaps can never be utilized for building-purposes; but the hill below the southerly one of these is rapidly filling up with buildings, and that on the north will in time probably be utilized for the same purpose. Underlying the whole territory is slate rock covered by a stratum of gravel, which in its turn is covered by a depth of from 150 to 200 feet of clay immediately below a surface layer of yellow sand. On the slopes the soil is mainly clayey, but becomes a loamy mixture of clay and sand at the top of the plateau, and runs thence to sand toward the west. The natural drainage is perfect, as it runs into creeks in the center of the ravines and thence into the Hudson. The country



ALBANY,
N. Y.

SCALE. 0 1/4 1/2 mile.

on all sides is broken and similar in character to that of the city. There are no ponds, lakes, or marshes worthy of mention in the vicinity within a distance of 15 miles. The country is open, having been reclaimed for agricultural purposes. To the north and northwest it is, however, not wholly reclaimed, as the soil there is not so well adapted for farming purposes. Within a radius of 5 miles the soil to the west and southwest is a yellow sand or loam with clay in ravines and lowlands; to the northwest the soil is of sand and gravel; to the northwest by west and north the soil is of gravel, while to the east it is variable, clay and gravel prevailing, though there is some sandy soil with rocky outcrops on elevations.

CLIMATE.

The highest recorded summer temperature in the seven years during which the records have been carefully kept is 93°, the highest in average years being 91.7°. The lowest recorded winter temperature during the same period is -18°, although the average years give the lowest temperature in winter as -12.5°. The highest average temperature for any one year was 48.8°, in 1878. The Hudson river with its tributaries, the only large body of water in the vicinity, has a tendency to moderate slightly the extreme cold of the winter, but the alluvial deposits formed along its banks tend in the spring to create malaria. The elevated lands in the immediate vicinity of the city influence the climate only slightly, but the Helderberg, Catskill, the Green mountains, and the Adirondack mountains influence the climate by making it somewhat more severe than it would be were they more removed from it; but by shielding it from the winds and by attracting the storms they render Albany a service which recompenses it for the little extra cold they cause. The winds are variable, although the northwest, a piercingly cold wind coming from the Adirondacks, may be said to prevail in winter. The southwest-by-south prevails in summer; this wind coming up the Hudson valley tends to moderate cold and increase moisture. The annual rainfall is, however, less than that of any city east of the Mississippi and its tributaries, and regularly much less than that of Troy, only 4 miles away.

STREETS.

The streets of Albany are very irregularly laid out. There are 90 miles of unpaved and 42.97 miles of paved streets; of the latter, 38.12 miles are paved with cobble-stones, 3.70 miles with granite or stone blocks, and 1.15 mile with broken stone (Telford macadam). About 1872 a little wooden pavement was laid, but proved very unsatisfactory. The cost of the pavement is, for cobble-stone, per linear foot, \$7; for the granite block, per square yard, \$2 26. The average cost of yearly repairs is 17 cents per square yard for cobble-stone, and so far no repairs have been found necessary in the granite blocks, which have been in use but four years. The granite blocks are found much the easier to keep clean, but as to permanent economy no comparison can yet be made. The principal sidewalks are now wholly of flagstones, which within eighteen years have replaced the old brick walks. All others throughout the city are laid with a 4-foot center flag and sided with brick. In remote suburbs plank walks prevail. The street-gutters are merely depressions of the regular street pavement, with receiving-basins for surface-water at irregular points. There are many trees lining the sidewalks, the result rather of individual taste than of any general system. There is no grassing at the sides of the sidewalks or in the center of the streets. The work of street construction is done by contract. The work of repair is done by day labor under charge of the street department, which is limited by law to 10 laborers, although power is given to increase the number in an emergency. The street fund, devoted simply to repairs, was, in 1879, \$20,000. Neither a steam crusher nor a roller is used, the kind of paving making them useless. There are two horse-railroad companies. The Watervliet Turnpike and Horse Railroad Company runs through the city and beyond it to a point opposite Troy, with a branch to the lumber district in the suburbs of Albany. Its total length is 7.25 miles; the total number of cars is 22; 135 horses and mules are used, and in 1879 it carried 934,884 passengers at local rates of 5 cents, and at fares varying from 5 to 15 cents according to distances. The Albany Railway Company has four local branches; its total length is 9.045 miles; it has 33 cars—19 in daily use—and 172 horses, and employs 101 men; and in 1879 carried 1,782,421 passengers at fares of 6 cents, with tickets at 5 cents. There are no omnibus lines.

WATER-WORKS.

The water-supply of Albany is taken from two sources—one the network of small streams and creeks to the west of the city on elevated ground, and of great purity; the other the Hudson river, the purity of which is disputed. The latter has been in use about seventeen years, and, while condemned by many, seems not to have seriously affected the health of the community.

The original cost of the water-works was \$850,000, and of the annex \$700,000, making the total cost \$1,550,000. There are two reservoirs, known as the Bleeker and Prospect Hill reservoirs; the first is 246 feet, the second 301 feet above mean tide-water. Two engines are now in use; one pumps from the Hudson into Bleeker reservoir, the smaller pumps from this reservoir into the Prospect Hill reservoir. The large engine is low-pressure beam, the smaller high- and low-pressure beam. The daily average total amount pumped is 5,478,004 gallons, the largest amount pumped is 6,384,950 gallons, the smallest amount 4,711,400 gallons per day of ten hours fifty-six minutes. The cost of raising 1,000,000 gallons 1 foot is 1.622 cent, as it requires 11.588 pounds of Lackawanna grate-coal,

costing \$2 80 per ton of 2,000 pounds. The yearly cost of maintenance aside from pumping is \$18,988 12, while the yearly income from water-rates is \$143,051 35. Worthington meters are used, and 7 of these are in operation, resulting in a great saving of water, and assisting materially in determining the amount of water and the rates.

GAS.

The city is supplied with gas by two companies, known, respectively, as the Albany and the People's Gas Light Companies. The daily average production, as estimated from the annual production, is 324,640 cubic feet. These companies charge a uniform rate of \$2 50 per 1,000 feet to private consumers and to the city in its public buildings. It is commonly understood that large consumers make better terms, but in each instance such arrangement is so carefully concealed as to defy the most careful inquiry that has been made. There is much general objection to the price as charged. In 1878 the city contracted for five years with each of these companies to furnish gas for street-lamps at \$35 per year each, no given number of lamps being fixed. The number of gas-lamps lighted is continually varying; in February, 1880, there were 1,108 gas-lamps for which gas was regularly furnished to the city by the companies. These lamps are lighted by the companies, and are kept lighted during certain hours every night in the year, according to a table of hours furnished to the companies by the lamp department. In lanes, alleys, and the suburbs oil-lamps are used. There are 948 of these in use.

PUBLIC BUILDINGS.

The city owns and uses for municipal purposes the city building, a brick structure, and the city hall, of Connecticut freestone; 24 public school-houses; 10 engine- and truck-houses and a hose depot; 4 police stations; an almshouse with farm of 116 acres; and an oil-house connected with the lamp department. These buildings were valued at the beginning of 1880 at \$1,101,000, as follows: High school, \$130,000; 23 public schools, \$411,700, and one building-lot, \$9,000; engine-houses, etc., \$106,700; police stations, \$47,000; almshouse and farm, \$159,000; city building, \$115,000; and oil-house, \$2,600. The city hall, then valued at \$120,000, and costing when built in 1829 \$95,000, of which the city paid directly \$80,000 and indirectly \$10,000 more, was burned and wholly destroyed February 10, 1880. It was occupied by the city and county in common, and the fire originated in the county office.

PUBLIC PARKS AND PLEASURE-GROUNDS.

The total area of the public parks of Albany is 88.617 acres. *Washington Park*, the principal park of the city, contains 74.620 acres, and is situated geographically in the center of the city, but southwest from the center of population, upon the highest plateau of the city. It is under the control of a special commission created by the legislature, and wholly independent of the city authorities, but maintained by a special tax included in the budget of each year. It is beautifully laid out, and is greatly used by pleasure-seekers. The original designers were Messrs. Bogart and Culyer, from 1870 to 1872, since which time it has been in the hands of Messrs. William S. and Alfred Egerton. The cost of the park and lands was \$792,511, and the cost of maintenance in 1879 was \$9,000, while in 1880 it was increased to \$13,000. The other parks, ten in number, vary in area from 0.249 acre to 5 acres, and are called *Academy*, *Clinton*, *Delaware*, *Capitol*, *Townsend*, *Hudson*, *Bleeker*, *Beverwyck*, *Van Rensselaer*, and *Saint Joseph's* parks. No estimate of their cost can be given. They are controlled by the committee on public buildings and parks, whose action passes the scrutiny of the common council, and then of the mayor, who has a vote overruled only by a two-thirds vote of the common council.

PLACES OF AMUSEMENT.

There is but one theater in Albany, the Leland opera-house, built in 1825; it seats 800, and is valued at \$41,000; it has a varied and interesting history. There are two lecture- and concert-halls. Tweddle hall, costing about \$100,000, is situated directly in the business center, and seats 1,100. Martil opera-house, at the corner of Beaver and South Pearl streets, was built in 1870 and seats 1,400. Theaters pay a license of \$25 per annum, although the mayor can at his discretion grant a license at a reduced rate. There are no halls of importance, and no concert- or beer-gardens except of the smallest consequence and of ephemeral character.

DRAINAGE.

The sewerage of Albany has not been constructed according to any comprehensive plan, and there is no map showing what has been done. Where natural water-courses traverse the city and take a large part of its drainage, they have been covered and converted into sewers, following nearly the natural beds of the streams, and receive the discharge from sewers along their course.

The easterly and lower parts of the city were first closely built upon and furnished with sewers built according to the local needs. When the city extended over the westerly and higher districts, sewers of larger size were constructed, but the old ones into which they discharged were too small for the increased demand, and much damage

was caused by obstructions and overflows. Since 1879 sewers of large size have been built at greater expense, and have afforded relief not only in a sanitary but in a pecuniary way. The succeeding reports of the corporation counsel state that the number of suits for damages for sewer-overflows was trivial when compared with previous years.

The materials used for building sewers are stone, brick, and vitrified clay pipe. Those designated as "stone and brick" are built with stone sides and a brick arch. Almost all sewers, except outlets of large size, are now made of vitrified pipe. Hollow invert blocks for subsoil drainage have not been used. The mouths of sewers discharging into the Hudson river are above water and fully exposed. Sewers of large size are ventilated by means of perforated manhole covers. No provision is made for ventilating the smaller sewers. The rate of fall is usually so great that deposits and obstructions are not often troublesome. When discovered to be necessary, pipe-sewers are flushed and the large ones are cleaned by hand. This is done by men regularly employed by the city for general purposes, and no separate account is kept of the cost. The final disposition of sewage is into the Hudson river.

The cost of sewerage-works is assessed upon property benefited on the basis of frontage. In some cases of large and expensive improvements the state legislature has made exception to the charter rule and made the cost a general municipal charge.

The averages of contract prices are as follows, the average depth of cuttings being 9 feet:

	Cost per foot.		Cost per foot.
8-inch pipe	\$1 00	3 feet diameter, brick	\$5 00
12-inch pipe	1 25	4.5 feet diameter, brick	6 50
15-inch pipe	1 75	7 feet diameter brick	7 00
18-inch pipe	2 25		

Manholes and inlet-basins, \$75 to \$100 each.

CEMETERIES.

Albany makes use of 5 cemeteries—*Saint Agnes'*, *Saint Joseph's*, and *Saint John's*, all Roman Catholic; a Jewish cemetery, and *Rural* cemetery. With the exception of Saint Joseph's cemetery, which lies in the immediate suburbs, they lie about $3\frac{1}{2}$ miles from the city limits. Saint Agnes' cemetery, containing about 19 acres, lies on the west side of the road to Troy, and the Rural cemetery, containing about 38 acres, lies adjoining to the north. New Saint John's, or Calvary, cemetery contains about 18 acres, and lies about 4 miles south of the city. Saint John's old burying-ground lies west of the south part of the city, within the city limits, and was opened in 1841 and closed in 1878; it covered $7\frac{5}{8}$ acres, and contained when closed about 30,000 bodies. Rural cemetery was opened in 1842, and contains 25,149 interments. Saint John's, or Calvary, cemetery, opened in 1875, contains 213 bodies. The records of Saint Agnes' cemetery have been so carelessly kept that no reliable data as to the number of interments is obtainable, while it has also been impossible to secure information of the Jewish cemetery. The laws of the city require that a permit of burial shall be obtained from the registrar of vital statistics before an interment can be allowed. All graves must be at least 6 feet deep, and in the case of persons dying of contagious and infectious diseases the interment must be within the twenty-four hours immediately following the death. No limit of time for burial seems to be set in other cases. Rural and Saint Agnes' cemeteries are finely laid out, but the others have been carelessly maintained. In the earlier times burial-grounds were found not only within the city limit, but also in the center of the city. Within what is now Washington park there were once four burial-grounds, each in use up to 1869, when the bodies they contained were removed. A large number of the bodies interred in Saint John's old cemetery have been removed to Saint Agnes', and interments in the old ground are now forbidden by law.

MARKETS.

There are no public or corporation markets in Albany. State street, an avenue of great width, is occupied every week-day by meat wagons and farmers' wagons, the center of the street for about 600 feet being used for the purpose. Although the practice is in violation of law, it is and for a long time has been tolerated.

SANITARY AUTHORITY—BOARD OF HEALTH.

The chief sanitary authority of Albany is vested in a board of health consisting of the mayor *ex officio*, the city physician *ex officio*, and the health committee of the common council, a standing committee of that body appointed by the president of the council and consisting of himself and four members of the common council. The members of the board receive no salary for this service, and the board incurs no expense except in the emergency of an epidemic, or in conditions of a similar character. It may increase its expenses during an epidemic to any amount it deems necessary, for as no specific rule forbids, the board has always interpreted its authority. Its authority both during and in the absence of an epidemic is limited only by reasonable discretion as to the exigencies of the case before it, but is never exercised except in a precautionary way in the absence of an epidemic. The chief executive officer of the board is an inspector of health, appointed annually by the board, who receives a

salary of \$900 per annum, and has authority to enter all premises, to inspect and report all alleged nuisances, and, failing to obtain relief, to report to the board, which, at its discretion, orders abatement. The meetings are held whenever called by the mayor or by three members. The mayor's second clerk is clerk of the board and keeps all its records. One assistant, the deputy inspector of the board, is employed at a salary of \$900, and acts as clerk of the market, inspecting all meats exposed for sale, condemning that unfit for use, and ordering its destruction. None of the board are physicians, except the city physician, who is, as stated, a member *ex officio*, but receives no addition to his salary of \$1,200 per annum for this service. Only the inspector and deputy inspector have police powers, and these do not extend beyond the power to enter premises for the purpose of inspection. Inspections are made by the board or its officials only when complaint of a nuisance is made; but the police, in the spring of each year, make a thorough inspection of all yards, out-houses, etc., and report to the chief of police, who orders an abatement of nuisances found. A second inspection is made at the end of two weeks, and all nuisances then found unabated are reported to the board of health, which then makes an inspection and takes such action as seems best to it. The board controls the cases of defective house-drainage, privy-vaults, cesspools, sources of drinking-water, etc.; but defective sewerage, street-cleaning, etc., is in the hands of the police captains, who are required to see that the contractors for sewer and street-cleaning perform their duty, or to rectify all omissions at the charge of the contractors.

GARBAGE.

Garbage is removed by contractors, and, except as nuisances arise from the contractors' neglect, the board of health has no authority to interfere.

BURIAL OF THE DEAD.

All persons dying of infectious or contagious diseases must be buried within the twenty-four hours next following the death. All interments are made on a permit granted by the city registrar on receiving a certificate of death signed by the attending physician, or, if there was none, by the householder in whose house the death occurred, or by a coroner if an inquest has been held. This certificate must contain the name, age, sex, social condition (whether married, single, or widowed), color, cause of death, etc., of the deceased. All graves must be at least 6 feet deep.

INFECTIOUS DISEASES.

Small-pox patients are taken to a pest-house in the suburbs on the almshouse farm, but sometimes patients are quarantined at home under strict police surveillance. In virulent cases of scarlet fever the patients are treated in the same way, but the plan is very rarely adopted. In cases of the breaking out of contagious diseases in the public or private schools the board can exercise its authority and close the schools if it deems it best for the public health. Vaccination is compulsory when ordered by the board, and in such cases is done at public expense. The registration of births and deaths is in the hands of the city registrar, but no registration of diseases is maintained, except in cases of death.

REPORTS.

The board makes no report. The city physician makes a monthly report to the common council concerning deaths, and admissions and departures from the almshouse. The city registrar reports the vital statistics yearly to the common council.

Five district physicians are appointed biennially to attend without charge the sick and infirm poor; their salary is \$400 per annum.

MUNICIPAL CLEANSING.

Street-cleaning.—The accumulations in the streets, alleys, and public ways are required to be collected in heaps in front of premises by the occupants or owners, and are then removed by contractors. The work is done wholly by hand, no sweeping-machines being used; but the contractor is bound to remove only such accumulations as he finds arranged in heaps, and not to gather the ordinary accumulations of earth, sand, dirt, etc., in the street unless so arranged in heaps. The contractors agree to make such removals on certain specified days twice in each week during the spring, summer, and fall, making their rounds in certain specified routes determined by the police captains of the precinct in which the contractor is at work, to whom he must report for any instructions they may wish to give, and under whose supervision the work is done. The sweepings are deposited in certain dumps in the suburbs, so that no nuisance may result, on the property of the contractors. In all there are five contractors receiving in gross \$14,502 from the city. The work has been well done since 1879, but the system is excellent rather in theory than in fact; for the conditions of the contracts are not rigidly enforced, and the owners and occupants of premises are not compelled to perform their duty in cleaning the streets as required by the city ordinances.

Removal of garbage and ashes.—Garbage is removed by contractors, who are required by the ordinances of the city to make such removal at least twice in each week during May and October, three times each week during June, July, August, and September, and once each week during the rest of the year; but the terms of the special contracts require a removal each day of the week. Garbage must be kept in suitable receptacles while awaiting removal, and must not be placed on any sidewalks or in any public place. The removal must be made in

tight carts, and all unnecessary filth avoided. Ashes and garbage must be kept in separate vessels and removed separately. The cost of the removal to the city can not be ascertained. Ashes are removed by private parties, who make such arrangements with the householders as they are able. The garbage is removed beyond the city limits, and is used in feeding swine, or is destroyed in some way. Ashes are deposited in the suburbs in certain dumps. Undoubtedly some injury to health arises from the improper keeping of garbage while awaiting removal and from improper handling. The board of health can interfere if complaint is made. The contractors do not fulfill and never have fulfilled the conditions of their contracts, as they could not afford to do it at the contract price.

Dead animals are removed by the contractor for the removal of night-soil. Small animals are taken in a boat, provided for the purpose by the contractor, to a point 4 miles below the South ferry, and at night at the flood tide thrown into the Hudson. Large animals, *i. e.*, horses, cattle, swine, calves, and sheep, are taken outside the city limits and buried sufficiently deep to avoid any nuisance from their putrefaction. No record of the number removed has been kept. The police keep a close watch over the contractor, and compel a satisfactory performance of the contract.

Liquid household wastes.—All liquid household wastes are run into the public sewers, except in the suburbs where drains or sewers have not been laid. There are very few cesspools in the city. No cases of contamination of drinking-water from leakage from drains have occurred, except in the case of some of the old town pumps. As fast as these have been found impure the wells have been filled up, and the number is constantly being reduced. Where cesspools are used they must be tight, and cleaned at such times and in such ways as the ordinances may direct.

Human excreta.—Within a radius of half a mile of the center of the city five-eighths of the buildings are provided with water-closets; beyond this for a radius of a quarter of a mile three-fifths of the buildings and two-thirds of all other buildings in the city depend on privy-vaults. All water-closets deliver into the public sewers. Privy-vaults must be constructed at least 18 inches distant from any partition fence, and at least 20 inches distant from any dwelling, and the contents can be removed only between the hours of 11 p. m. and 3 a. m. The city contracts for the removal of night-soil, the contractor agreeing to maintain a boat fit for the purpose, which shall be ready at a certain pier between certain hours to receive each day such night-soil, dead animals, and other dead or putrefying matter as shall there be delivered. The boat will then carry this cargo to a certain point 4 miles below the South ferry and there dump it into the Hudson at flood tide in the night. For this service the city pays \$2,695, under a contract expiring May 20, 1882. During the period when the Hudson is closed by ice the contractor agrees to remove the night-soil, dead animals, etc., beyond the city limits, and so to dispose of it as to cause no nuisance.

Manufacturing wastes.—There is no system governing the disposal of manufacturing wastes.

POLICE.

The police force of Albany is appointed and governed by a non-partisan board of police commissioners, 4 in number, the mayor being *ex officio* chairman with vote. The members are to serve without pay, but one is named as secretary, and receives \$500 per annum as such. The commissioners hold office for four years, and in the election each voter votes for but two persons. The chief executive officer is the chief of police, who receives a salary of \$2,500 per annum, and has the general supervision and management of the force in all details, subject to the commissioners. The rest of the force consists of 5 captains, salary \$1,200 per annum; 10 sergeants, salary \$1,000 per annum; and 112 patrolmen, salary \$900 each per annum. Of these latter, 5 are assigned to detective duty and 6 as police-court officers. The captain has the rank and pay of a police captain. The uniform is a blue-cloth suit, round-crown stiff hat, and a white-metal badge. Blouses are worn in summer. The cloth is furnished to the men by the commission. Sergeants and captains wear the same uniform, with a gilt badge and the name of their rank on the hat-front. The men buy their own uniforms and equipments except shields, the cost complete being \$150, and the suit with care will last three years. The men are armed with locust clubs by day and revolvers by night. They are on duty 6 hours each day and 6 hours each night, having every other day off duty, but always subject to fire duty in their own precinct, and patrol about 65 miles of streets. During the year ending November 30, 1880, the police made 3,038 arrests, the principal causes being: Intoxication, 1,655; assault and battery, 805; violation of excise law, 454; breach of the peace, 291; and petit larceny, 286. Of those arrested, 2,031 were committed, 734 fined, 655 discharged, and 163 sent to the penitentiary. One hundred and forty-one lots of stolen property were taken by the police, for 95 of which owners were found. During the year, 2,172 station-lodgers were cared for, but no record of the cost is kept. The police are required to attend and preserve order at fires, and it is customary to make a yearly inspection of all out-houses, to notify occupants to clean sidewalks, and to report all nuisances. Special police are appointed by the police commission, and paid by the parties who seek their appointment. They have the same powers of arrest as patrolmen. The total cost of the police force during 1880 was \$130,931 35. The force is an excellent one, but much too small for the requirements of the city. It is limited by law to 120 men, and, with over 100 miles of streets to patrol, this force is not adequate for all demands.

MANUFACTURES.

The following is a summary of the statistics of manufactures of Albany for 1880, being taken from tables prepared for the Tenth Census by F. E. Wadhams, 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.....	804	\$14,684,190	0,820	1,528	428	\$4,566,424	\$12,500,302	\$21,751,009
Agricultural implements.....	3	350,000	280	.....	.....	70,788	146,000	330,586
Blacksmithing (see also Wheelwrighting).....	38	50,670	83	.....	2	40,326	86,365	114,819
Bookbinding and blank-book making.....	7	47,100	52	22	8	35,569	48,112	103,407
Boots and shoes, including custom work and repairing.....	55	652,545	1,178	460	30	549,700	1,294,023	2,227,616
Boxes, cigar.....	5	15,500	15	14	3	6,175	24,183	40,639
Boxes, fancy and paper.....	3	18,000	9	73	3	15,655	22,423	46,405
Brass castings.....	4	31,800	40	.....	2	4,650	11,925	23,335
Bread and other bakery products.....	50	547,135	324	53	25	209,880	794,809	1,187,939
Brick and tile.....	10	167,000	246	.....	42	71,805	45,057	171,800
Brooms and brushes.....	3	33,674	24	.....	6	11,600	32,657	83,768
Carpentering.....	50	190,070	479	.....	4	226,441	308,545	601,313
Carriages and wagons (see also Wheelwrighting).....	10	153,768	150	.....	1	54,701	80,508	175,025
Clothing, men's.....	45	404,541	681	250	9	260,426	481,832	917,646
Coffee and spices, roasted and ground.....	5	167,775	39	1	2	25,389	467,800	557,126
Coffins, burial cases, and undertakers' goods.....	9	62,800	22	4	.....	10,270	22,608	52,295
Confectionery.....	19	61,500	48	29	15	30,221	53,594	160,921
Cooperage.....	8	45,500	40	.....	4	19,366	54,650	83,900
Dentistry, mechanical.....	10	11,900	7	.....	4	3,718	4,750	17,250
Dyeing and cleaning.....	4	22,500	19	6	1	8,100	4,566	21,405
Electroplating.....	4	14,000	25	.....	6	18,477	5,300	29,563
Engraving and die-sinking.....	3	7,800	9	1	1	6,666	8,000	23,700
Engraving, wood.....	5	3,400	7	.....	.....	5,248	500	14,600
Flouring and grist-mill products.....	2	222,000	33	.....	.....	16,000	300,000	354,720
Foundry and machine-shop products.....	28	3,070,950	2,156	.....	59	974,145	1,159,617	2,056,635
Furniture (see also Upholstering).....	11	176,800	131	4	11	53,651	100,700	211,391
Hairwork.....	6	10,625	.....	15	.....	3,014	6,534	15,535
Instruments, professional and scientific.....	4	7,300	3	.....	1	1,025	675	6,642
Jewelry.....	7	24,100	23	1	1	13,650	10,250	13,200
Kindling-wood.....	9	17,900	19	.....	8	6,987	20,650	38,800
Leather, curried.....	3	43,000	19	.....	.....	7,644	69,336	89,305
Liquors, malt.....	17	1,943,500	660	.....	.....	291,806	1,479,296	2,641,600
Looking-glass and picture frames.....	3	18,900	27	.....	3	14,669	13,962	35,907
Lumber, planed (see also Sash, doors, and blinds).....	4	100,000	134	.....	25	52,597	37,250	111,211
Malt.....	13	1,322,688	155	.....	.....	52,622	1,111,656	1,348,838
Marble and stone work.....	9	39,600	47	.....	.....	19,777	20,260	57,600
Masonry, brick and stone.....	4	2,500	20	.....	.....	6,012	6,850	19,000
Mineral and soda waters.....	5	44,800	44	.....	.....	15,221	60,906	167,168
Models and patterns.....	4	2,300	5	.....	.....	2,100	550	6,300
Musical instruments, pianos and materials.....	7	227,200	169	.....	1	77,787	129,117	248,000
Painting and paper-hanging.....	30	59,250	164	.....	2	73,159	76,800	193,828
Patent medicines and compounds.....	5	47,000	21	7	7	13,700	47,075	85,126
Photographing.....	13	86,025	30	13	4	20,873	24,048	87,032
Plumbing and gasfitting.....	24	85,050	103	.....	3	50,444	101,856	266,178
Printing and publishing.....	17	1,032,500	528	148	14	342,189	340,717	875,025
Roofing and roofing materials.....	3	20,500	42	.....	.....	21,900	47,250	79,475
Saddlery and harness.....	19	31,638	43	.....	1	18,319	23,116	66,539
Sash, doors, and blinds (see also Lumber, planed).....	7	54,000	104	.....	4	40,100	77,260	143,025
Shipbuilding.....	3	15,000	71	.....	.....	53,200	27,800	60,000
Shirts.....	8	41,800	14	80	.....	25,325	131,318	171,778
Slaughtering and meat-packing, not including retail butchering.....	10	193,000	70	.....	.....	18,182	750,645	804,773

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.			
Soap and candles	6	\$65,800	9	.....	.....	\$4,476	\$38,011	\$60,152
Stationery goods	3	275,000	67	02	.....	40,404	278,459	366,046
Tinware, copperware, and sheet-iron ware	24	83,200	81	.....	5	30,000	75,601	130,634
Tobacco, cigars and cigarettes	50	220,450	290	49	30	121,057	269,059	545,246
Upholstering (see also Furniture)	4	15,450	16	6	1	10,568	28,526	47,302
Wheelwrighting (see also Blacksmithing; Carriages and wagons)	7	7,500	11	.....	.....	3,462	4,400	12,600
Wirework	6	11,575	13	1	3	4,907	52,700	67,533
All other industries (a)	72	1,908,302	736	202	68	384,892	1,607,256	2,687,520

a Embracing awnings and tents; axle-grease; baking and yeast powders; billiard tables and materials; blacking; bluing; boot and shoe cut stock; boot and shoe findings; boot and shoe uppers; boxes, wooden packing; carriage and wagon materials; collars and cuffs, paper; coppersmithing; cordage and twine; cork cutting; cutlery and edge tools; drugs and chemicals; enameling; fancy articles; fertilizers; files; food preparations; furs, dressed; gas machines and meters; gold and silver leaf and foil; hats and caps; hosiery and knit goods; housefurnishing goods; ink; iron and steel; iron railing, wrought; lasts; leather, tanned; lock- and gun-smithing; mantels, slate, marble, and marbleized; mattresses and spring beds; millinery and lace goods; musical instruments and materials (not specified); oilcloth, enameled; paving materials; plated and britannia ware; pumps; refrigerators; safes, doors, and vaults, fire-proof; saws; silverware; springs, steel, car, and carriage; steam fittings and heating apparatus; stencils and brands; stone- and earthen-ware; tobacco, chewing, smoking, and snuff; umbrellas and canes; varnish; vinegar; wooden ware; and wood, turned and carved.

From the foregoing table it appears that the average capital of all establishments is \$18,263 84; that the average wages of all hands employed is \$387 48 per annum; that the average outlay in wages, in materials, and in interest (at 6 per cent.) on capital employed is \$22,334 37.

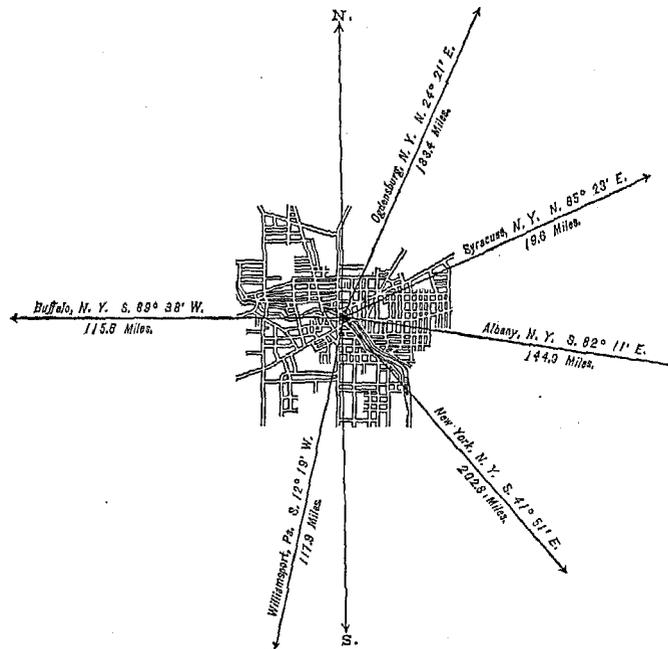
AUBURN,

CAYUGA COUNTY, NEW YORK.

POPULATION

IN THE
AGGREGATE,
1850-1880.

Year	Inhab.
1790	.....
1800	.....
1810	.....
1820	.....
1830	.....
1840	.....
1850	9,548
1860	10,986
1870	17,225
1880	21,924



POPULATION

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

Male	10,940
Female	10,984
—	
Native	16,981
Foreign-born	4,943
—	
White	21,514
Colored	*410

* Including 6 Indians and 1 Chinese.

Latitude: 42° 55' North; Longitude: 76° 35' (west from Greenwich); Altitude: 670 to 820 feet.

FINANCIAL CONDITION:

Total Valuation: \$8,804,449; per capita: \$402 00. Net Indebtedness: \$530,000; per capita: \$24 17. Tax per \$100: \$2 68.

HISTORICAL SKETCH.

Auburn, the shire town of Cayuga county, New York, is situated on both sides of the outlet of Owasco lake, and is a lively and flourishing city. The first settlement here, the country being a wilderness and inhabited by Indians, was in 1793. In 1805 it was made the county-seat, and the court-house was erected in 1809. In 1810 it contained 90 houses and a number of manufactories, and had a library of 220 volumes. In 1837 a fire destroyed property to the value of \$100,000. This has been followed by several fires of less magnitude, the recovery from which, with more substantial buildings, has been rapid and satisfactory.

The population came originally from the eastern states, and no other element has supplanted it. The principal public buildings and mercantile houses are on Genesee street. The city contains many fine private residences, and was long the home of William H. Seward. One of the three state prisons is located here, and is celebrated for its system of discipline. Here is also a theological seminary under the direction of the Presbyterians.

AUBURN, N. Y.

SCALE OF RODS.

0 10 20 30 40 50 100 150 Rods.



AUBURN IN 1880.

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

LOCATION.

The city lies in latitude $42^{\circ} 55'$ north, longitude $76^{\circ} 35'$ west from Greenwich, on both sides of the outlet of lake Owasco, $2\frac{1}{2}$ miles below the lake. The altitudes above sea-level are: Average, 770 feet; lowest point, 670 feet, and highest, 820 feet. The outlet, on which the city lies, is not navigable.

RAILROAD COMMUNICATIONS.

Auburn was originally on the main line of the New York Central railroad, between Albany and Buffalo, but later a new main line, from Syracuse to Rochester, was built, leaving the city on what is now known as the "Auburn branch". The Southern Central railroad also runs through the city, from Pennsylvania to Fair Haven on lake Ontario.

TRIBUTARY COUNTRY.

The adjacent country, with which the city has a local trade, is chiefly agricultural, producing most of the products of northern farming, with beef, pork, mutton, and poultry.

TOPOGRAPHY.

The site of the city is somewhat uneven and inclines toward the north. The underlying rock is of the Onondaga salt group. The soil is a gravelly loam, mixed with clay, muck, and alluvium. The variations of level amount to 150 feet. The natural drainage is toward Owasco river. There are no marshes or ponds near. The country within a radius of 5 miles is open. The site of the city is 383 feet above Cayuga lake and 450 feet above lake Ontario.

CLIMATE.

Highest recorded summer temperature, 95° ; highest summer temperature in average years not given. Lowest recorded winter temperature, -10° ; lowest winter temperature in average years, -2° to -10° . The prevailing winds are from the northwest, and, as there are no high lands between Auburn and lake Ontario, there is consequently much cloudy and damp weather.

STREETS.

The total length of streets is about 75 miles, paved with the following materials: Stone blocks, $\frac{1}{3}$ mile; wood, $\frac{1}{3}$ mile; broken stone, 30 miles; and gravel, 35 miles. This leaves about 10 miles unpaved. The cost of each per square yard, as nearly as it may be estimated, is—for stone blocks, \$1 65; for wood, not reported; for broken stone (1 foot thick), \$1; and for gravel (1 foot thick), 60 cents. No data exist from which to estimate the cost of keeping each in repair, this depending very much on the amount of traffic over them. The stone-block pavement is the most easily kept clean, and is also the most durable. Sidewalks are laid with wood and stone. On the principal streets blue or Frog Point stone is in general use; on side-streets and streets chiefly containing residences plank walks abound. On the principal streets the gutters are paved with stone 2 feet from the curb. At an early date tree-planting in the streets was very generally practiced in Auburn, much to the enhancement of the beauty of the place. This was commonly done on the line of the streets, between the sidewalks and curbstones, where was ordinarily a narrow grassed border. In many places these trees were originally planted too thickly, preventing the evaporation of water falling upon the streets, and keeping the surface damp for a long time after rains. This has led to the thinning out of the trees in many places. By ordinance, trees may hereafter be planted on a line inside the curb established by the city surveyor. The work of construction and repair is done by the street superintendent. The amount used annually for these purposes is about \$20,000. A steam stone-crusher was formerly used, but was abandoned because it was found to produce too large a proportion of fine chips and dust. Stone for street purposes is now broken by hand. There are $3\frac{1}{4}$ miles of horse-railroad in the city, with 6 cars and 12 horses, and employing 12 men. The rate of fare is 5 cents. There is 1 omnibus, with 4 horses and 2 men, that carries passengers at the rate of 5 cents per each fare.

WATER-WORKS.

The water-works are owned by the city, but their cost is not stated. The Holly system of pumping is used. The average amount pumped per diem is 2,100,000 gallons, the greatest being 2,400,000 and the least 1,800,000 gallons. The annual cost of maintenance, aside from the cost of pumping, is \$6,000, and the yearly income from water-rates is \$25,000. The Crown and Union Rotary water-meters are used, for the largest consumers, to the number of 60, and are found to reduce the amount of pumping about 25 per cent.

GAS.

The gas-works are owned by a private company. The average daily production is 75,000 cubic feet, and the charge per 1,000 feet is \$2 25. The city pays annually \$20 each for street-lamp, 748 in number.

PUBLIC BUILDINGS.

The city owns and occupies for municipal purposes, wholly or in part, the city hall, and 4 houses occupied by the fire department for hose companies. The total cost of these buildings is \$52,000. The city hall is owned entirely by the city, and cost \$40,000. The value of the public school-houses was not reported.

PUBLIC PARKS AND PLEASURE-GROUNDS.

There is but one park in the city, and it is less than an acre in area, called *Seward Park*, because of its fronting the residence of the late William H. Seward. It is triangular in shape, and is situated at the intersection of William and South streets. This park was a free gift by Judge Miller to what at that time was the village of Auburn, to be used as a "common or park by the village, and for no other purpose". Generally the park receives some attention from the superintendent of streets, and the citizens whose residences front on it keep the grass trimmed.

PLACES OF AMUSEMENT.

Auburn has 2 theaters—Skinner opera-house, with a seating capacity of 1,082, and Academy of Music, with a seating capacity of 791. All exhibitions pay a license to the city, and the revenue from this source amounts to about \$25 per annum. There are no concert-halls or lecture-rooms, neither are there any concert- or beer-gardens.

DRAINAGE.

The sewerage system, or rather want of system, originated with private individuals, who in many instances constructed channels for the purposes of soil or cellar drainage, and in many instances covered natural water-courses, which in process of time became used for sewer purposes. There has been no system of sewerage adopted by the city. As the improvements of the city progressed, sewers have from time to time been constructed, to meet what were believed to be the wants of the inhabitants of a particular street, part of a street or neighborhood, and, under the charter, the property benefited has been charged with the cost of the same in proportion to the benefit derived from the work. After the completion of each sewer ordered, the assessors have assessed the same on the property accordingly. In nearly every instance more or less of the individuals assessed have refused to pay their assessments, and, either from a defect in the law or from want of energy in enforcing it, many thousands of dollars have been expended by the city in sewers which still remain uncollected.

The provision for ventilation is by untrapped inlet-basins. The sewers discharge into Owasco river, the outlet of Owasco lake, their mouths being exposed except during very high water.

Sewers occasionally become obstructed, and in places have to be taken up and repaired. But few sewers of large capacity have been constructed in the city, and, prior to one now in process of construction, no manholes were provided.

Concerning the method of payment, it is stated that the "whole cost when completed is paid by the city, after which an assessment is made upon those benefited by the particular sewer, and the city gets back what it can". The assessment is laid according to the judgment of assessors on the basis of benefits derived.

His honor, C. Wheeler, jr., mayor, closes his report as follows:

At the present time there is in process of construction a sewer located in the second ward, and known as the Second Ward sewer. It is constructed under an act of the legislature of this state. It was let in four separate sections, and cost \$23,900, by estimate. The contract-price for section 1 was let for \$1,570, 39½ rods, 3 feet wide by 4 feet high, stone, sewer covered with 5-inch gray limestone, 2-inch pine-plank bottom. Section 2 let for \$3,546, 34.48 rods, same kind and size of sewer. Section 3, 136.48 rods, 3½ feet round, brick sewer, 8-inch walls, laid in water-lime, price \$3,200. Section 4, 93.9 rods, brick, 2½ feet round, 8-inch walls, laid as preceding. Average depth of excavations: Section 1, 8 feet; section 2, 9½ feet; section 3, 12½ feet; section 4, 10½ feet. Sections 1, 2, and 3 traverse an old water-course, over private property, the water-course being walled up with rough stone, and following a tortuous route without any attention to uniformity of grade.

Mr. N. A. Wright, city surveyor, appends the following remarks to a map, showing the location of existing sewers:

The outlet of Owasco lake passes northwesterly through the center of the most densely populated portion of the city of Auburn. It has a fall within the city of over 160 feet. There are eleven dams. There are but three sewers that do not empty into the outlet. There is but one sewer that has not a greater fall than ¼ inch to one rod. The fall of most sewers averages from 2 to 5 inches per rod. Franklin Street sewer, 215 rods, has a fall of 95 feet. Genesee Street sewer has a fall of 50 feet in about 150 rods. Several other shorter sewers have about the same fall. There are many old stone sewers, made without mortar, in various parts of the city that follow some stream or water-course in all its windings and turnings, which do good service yet, but no one knows from whence they come. All that is known of many of them is that they empty into the outlet. There is no record kept of any sewer further back than 1866; therefore, of the sewers built previous to that time but little is known. But few large sewers are required, for the reason that the fall generally is sufficient to carry a large amount of water through what in some places would be called a small sewer. Nearly all the flushing is done by the surface-water from the streets, which passes into the sewers through the conduits.

CEMETERIES.

There are 6 cemeteries and burial-grounds (public and private) connected with the city, as follows:

Fort Hill Cemetery.—Between Fitch avenue and Genesee street; area, 40 acres.

North Street Cemetery.—On North street, above Park avenue.

Holy Family Cemetery.—On State street, just inside the north line of the city; area, 10 acres.

Saint Joseph's Cemetery.—On extension of Moravia street, half a mile outside the city; area, 24 acres.

City Cemetery.—About 2 miles east of the city, area 28 acres.

Saint Peter's Church-yard.—On Genesee street. Interments are no longer made in the last-named.

Total number of interments in each cemetery, so far as could be ascertained, is about as follows: Fort Hill cemetery, 4,000; North Street cemetery, 3,000; Holy Family cemetery, 2,500; Saint Joseph's cemetery, 50; City cemetery, 300; and Saint Peter's church-yard, 100.

MARKETS.

At present there are no public or corporation markets in the city. About forty years ago the city erected a building, with suitable stalls, which was used as a market; but, owing to the number of private markets, it was soon abandoned and has not since been used for the purpose. Farmers' and hucksters' wagons are allowed to sell their wares through the streets.

SANITARY AUTHORITY—BOARD OF HEALTH.

The title of the chief sanitary authority of Auburn is the "commissioners of the board of health". It is an independent body, appointed by the common council and approved by the mayor, composed of three members and one health officer, who is a physician. The city government has no control over the board, except so far as salaries are concerned, after it is appointed. The annual expense of the board in ordinary times is for salaries of the members, each of them receiving \$50. During an epidemic, in absence of any city ordinance upon the subject, the board exercises its best judgment and incurs any amount of expense necessary for the object. An ordinance to cover this want is now in course of preparation. The extent of its authority in absence of an epidemic is to exercise a general supervision over the health of the city, and cause nuisances to be abated. During an epidemic it has authority (under the state laws) to quarantine the premises of those who may be attacked by the disease, and forbid approach to the same under a penalty of \$250. The chief executive officer of the board is the health officer, with a salary of \$50 per annum. The board transacts its business by occasional meetings to determine and decide upon the merits of complaints made. There are no assistant health officers or inspectors employed. It is the general practice to make inspections only as nuisances are reported, when the premises are visited, and it is then determined whether or not the matter is legally a nuisance. There is no established custom regarding the inspection and correction of defective house-drainage, privy-vaults, cesspools, and sources of drinking-water, circumstances generally governing. Defective sewerage, street-cleaning, etc., are attended to by a committee of the city government on drains and sewers. The board exercises no control over the conservation and removal of garbage, unless it becomes a nuisance. There are no regulations regarding the burial of the dead. At present the board has no regulations concerning the pollution of streams or the removal of excrement, but the matter is in hand, and these will soon be made.

INFECTIOUS DISEASES.

Small-pox patients are either isolated or quarantined at home, but scarlet-fever patients are not. The board takes cognizance of the breaking out of contagious diseases in public and private schools, and will make every effort to prevent their spreading. Vaccination is not compulsory.

At present there is no system of registration for births, deaths, and diseases, but the whole matter is now under advisement.

REPORTS.

The board reports to the common council if required so to do. The following note is appended to the schedule on health:

Auburn has been a very healthy city, from the high elevation above the surrounding country, and has been nearly exempt from epidemics.

MUNICIPAL CLEANSING.

Street-cleaning.—The streets are cleaned both by the city and by the abutters, the latter being, by ordinance, required to keep the gutters in front of their premises free from obstructions. The city's share of the work is done with its regular force. The work is done mostly by hand, one large diagonal scraper, drawn by two horses, being used to remove the dirt from the center to the sides of the street. The streets are cleaned when it is deemed necessary, and the work is done ordinarily well. The annual cost to the city for this service is \$1,200, but that to private parties is not stated. The sweepings are used for filling in new streets.

Removal of garbage and ashes.—The removal of garbage and ashes is done both by the city and by the householders. There are no special regulations on the subject. The garbage is taken to the suburbs, some being fed to swine and some being used as manure. The street superintendent, twice a week, has the ashes removed from the houses that have no yards, and disposes of them in the same manner as the street-sweepings. There is no way of ascertaining the cost of this work, either to the city or to the householders. Complaints are occasionally made of the garbage becoming a nuisance. But few cases of sickness, however, may probably be chargeable to or intensified by such conditions.

Dead animals.—A city scavenger is appointed for the purpose of attending to the removal of all dead animals upon notification. But any one upon whose premises any animal dies is required to bury the carcass 4 feet deep, or report its presence to the scavenger, under a penalty of from \$10 to \$50. Neither the cost nor the number of animals dying annually was stated. The system is reported to answer all requirements.

Liquid household wastes.—The chamber-slops are seldom disposed of in the same way as kitchen-slops and laundry wastes, except in cases of houses properly plumbed and connected with the sewers. As a rule, the former are thrown into privy-vaults and the latter into cesspools. In some localities where there are sewers all the liquid household wastes deliver into them, but a large portion of the city is without sewers. A considerable number of dry wells or cesspools are used, and in some cases they receive the wastes from water-closets. There are no regulations concerning their cleaning, except that they must not become offensive. It is reported that cases have occurred where drinking-water has been contaminated by the overflow or underground escape of the contents of vaults and cesspools.

Human excreta.—About one-third of the houses in the city have water-closets, one-half of which deliver into the sewers and one-half into cesspools, and the remainder depend upon privy-vaults. But a small proportion of the privy-vaults are water-tight. There are no regulations concerning their construction or cleansing, but by the use of deodorizers they are emptied at any time of the day or night, or in any weather, without being offensive. The night-soil is taken out of the city and used as a fertilizer, and it is not believed that any of it is used on land within the gathering-ground of the public water-supply.

Manufacturing wastes.—The liquid waste from the factories finds its way into Owasco river. The solid waste from founderies and rolling-mills is used for grading streets and for filling.

POLICE.

The police force of Auburn is appointed and governed by a board of commissioners composed of the mayor and 2 other members. The chief of police is the chief executive officer; has control of the force, and immediate charge of all police affairs; his salary is \$900 per annum. The rest of the force consists of 1 captain, at \$840 a year, and 13 patrolmen, at \$780 a year each. The uniform is a navy-blue frock coat, single-breasted, rolling collar, with nine buttons on breast, two on the hips, and two on bottom of skirt, and blue trousers and vest. Each patrolman carries a club, revolver, and hand-cuffs. The tours of duty are ten hours each, and the lengths of the beats are from one-quarter to one-half mile each. During the past year 1,205 arrests were made, the principal causes being for violation of city ordinances and intoxication, and on conviction the offenders were either fined or sent to jail. The amount of property lost or stolen during the year and reported to the police was \$816 57, and of this, \$432 85 was recovered and returned to the owners. The number of station-house lodgers for the same period was 394, as against 381 in 1879. Free meals, consisting of crackers and cheese, at a cost of 10 cents for each lodger, were furnished. The police are required to co-operate with the fire department by preserving order at fires, and with the health department by abating nuisances. Special policemen are appointed by the board of commissioners for special duty, but they receive no pay from the city. The yearly cost of the police force is about \$10,000.

MANUFACTURES.

The following is a summary of the statistics of the manufactures of Auburn for 1880, being taken from the tables prepared for the Tenth Census by Minard McDonald, 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.....	154	\$4,423,950	3,579	752	187	\$1,658,826	\$4,052,746	\$7,719,409
Agricultural implements	7	1,281,000	1,124	.....	8	551,314	894,800	2,416,075
Blacksmithing	8	14,000	13	.....	.....	6,120	7,600	21,900
Boots and shoes, including custom work and repairing	9	131,800	335	.....	.....	69,853	460,805	591,498
Bread and other bakery products	3	6,300	19	.....	.....	9,590	33,506	56,506
Carpentering	6	11,000	75	.....	.....	34,600	120,000	199,000

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 10 years.	Females above 15 years.	Children and youths.			
Dentistry, mechanical	4	\$14,500				\$3,261	\$12,510	
Foundry and machine-shop products.....	5	152,000	273			\$96,075	153,004	
Furniture.....	4	75,300	22			11,125	18,600	
Liquors, malt.....	4	132,000	16		6	10,017	47,434	
Marble and stone work.....	4	10,500	12			6,035	7,487	
Masonry, brick and stone.....	6	6,700	71			35,000	30,000	
Painting and paperhanging.....	4	10,050	10			6,400	13,800	
Photographing.....	8	20,600	47	15		24,710	24,450	
Printing and publishing.....	3	42,500	25	24	25	22,167	34,400	
Saddlery and harness.....	7	34,500	70			19,075	38,975	
Tinware, copperware, and sheet-iron ware.....	5	13,275	13			7,604	17,750	
Tobacco, cigars and cigarettes.....	15	21,325	29		4	15,378	22,546	
Woolen goods.....	3	940,000	351	325	26	204,745	799,577	
All other industries (a).....	49	1,556,000	1,068	388	118	529,018	1,310,001	

a Embracing bookbinding and blank-book making; boxes, fancy and paper; buttons; carpets, other than rag; carriages and sleds, children's; carriages and wagons; cement; clothing, men's; dyeing and cleaning; files; flouring- and grist-mill products; gloves and mittens; hairwork; hand-knit goods; hardware; hardware, saddlery; iron and steel; iron forgings; leather, curried; leather, tanned; lock- and gun-smithing; mattresses and spring beds; mineral and soda waters; models and patterns; oil, neat's-foot; patent medicines and compounds; pumps; sash, doors, and blinds; shirts; soap and candles; starch; tobacco, chewing, smoking, and snuff; tools; washing-machines and clothes-wringers; wheelwrighting; and window blinds and shades.

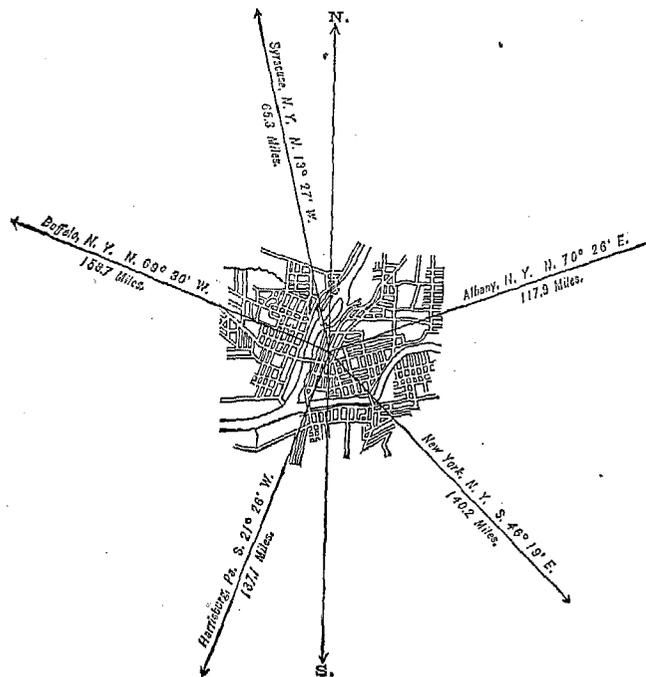
From the foregoing table it appears that the average capital of all establishments is \$28,726 95; that the average wages of all hands employed is \$367 16 per annum; that the average outlay in wages, in materials, and in interest (at 6 per cent.) on capital employed is \$38,811 75.

BINGHAMTON, BROOME COUNTY, NEW YORK.

POPULATION

IN THE
AGGREGATE,
1860-1880.

	Inhab.
1790.....	
1800.....	
1810.....	
1820.....	
1830.....	
1840.....	
1850.....	
1860.....	8,325
1870.....	12,692
1880.....	17,317



POPULATION

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

Male	8,239
Female	9,078
Native	14,815
Foreign-born	2,502
White	16,923
Colored	* 394

* Including 8 Indians.

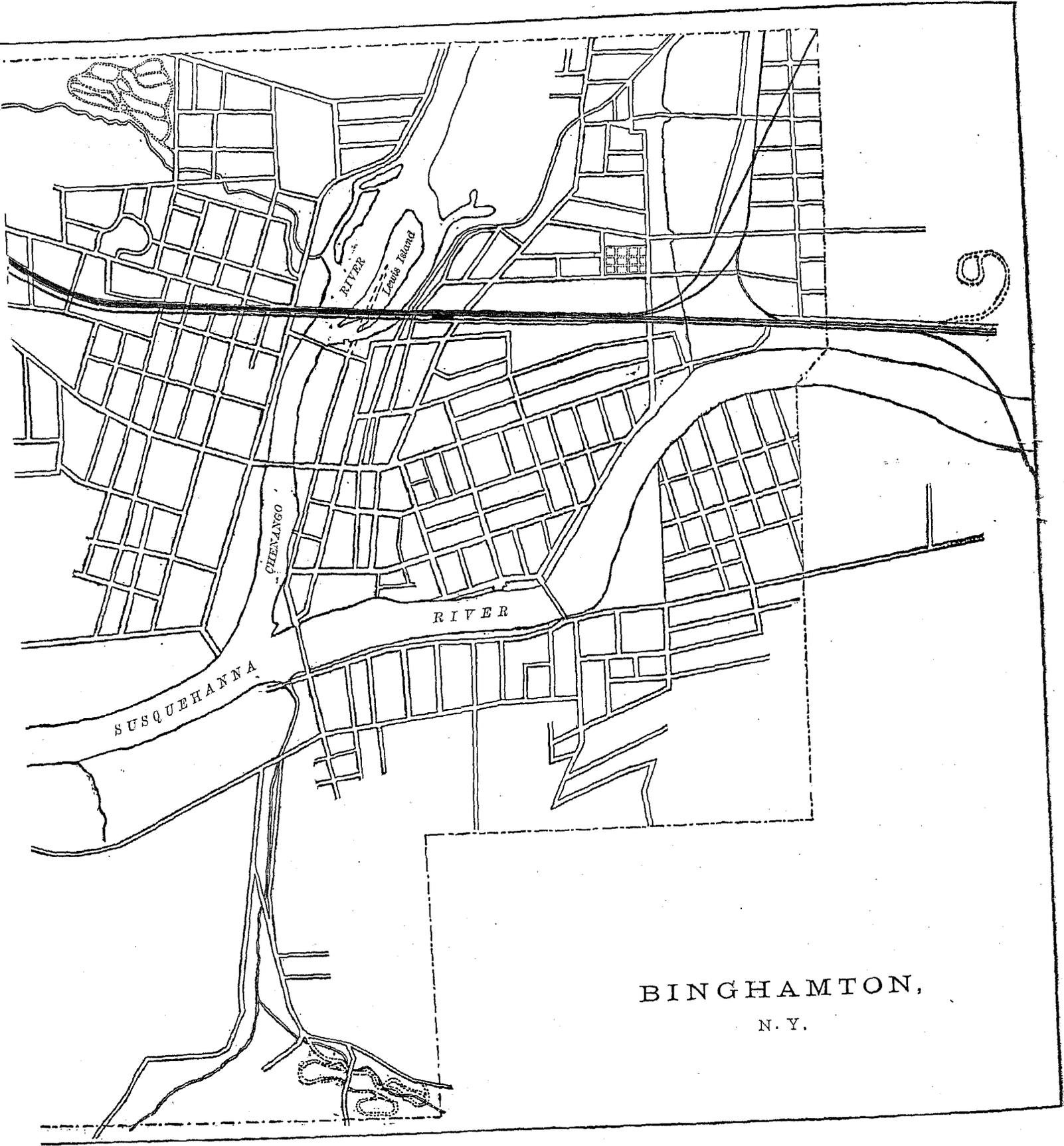
Latitude: 42° 7' North; Longitude: 75° 56' (west from Greenwich); Altitude: 820 to 920 feet.

FINANCIAL CONDITION:

Total Valuation: \$6,764,989; per capita: \$391 00. Net Indebtedness: \$299,500; per capita: \$17 30. Tax per \$100: \$2 16.

HISTORICAL SKETCH.

Soon after the close of the Revolution the state of New York sold to various parties large tracts of country in the central, southern, and western parts of its territory. Among these grants was one to William Bingham, then a merchant of Philadelphia, who purchased a strip of land a mile wide on both sides of the Susquehanna river, extending 7 miles above and 3 miles below the junction of the Chenango river with the Susquehanna. The first settlement on this tract was made in 1787, and in 1799 the village which had been started 1½ mile up the Chenango was removed down to the junction with the Susquehanna, and the nucleus of the future city of Binghamton was thus formed, and received the name of "Chenango village". The early settlers were largely from Massachusetts. The



BINGHAMTON,
N. Y.

growth of the village was for a long time very slow. The country was isolated, and its only industry was the lumber trade, great rafts of lumber passing down the Susquehanna, and often as far as Norfolk, Virginia. The land was then of little value for farming, and the whole energy of the people was directed to lumbering; and, while they had plenty to eat, money was a rarity except at the season of the return of the raftsmen from the drive down the Susquehanna. In 1806 Broome county was formed, the name being given in honor of the lieutenant-governor of the state, and Chenango village, which previously had formed part of Tioga county, was made its shire town. In 1822, the *Broome Republican*, the first newspaper of the village, was published. The growth of the village was still very slow. In 1834 it was incorporated as the village of Binghamton, and three years later its prosperity began. The completion of the Erie canal, affording direct communication between lake Erie and the Hudson river, had made the isolation of Chenango still more complete, and the citizens, with other inhabitants of Broome and the neighboring counties, began to urge the construction of branch canals to the Erie. Accordingly, the Chenango canal was built in 1837, and, opening up the lands along its course, greatly encouraged immigration to the portion of the state through which it passed. Binghamton received a great impetus from this immigration, and entered upon a period of prosperity and increase.

In 1838 the Binghamton bank, with an alleged capital of \$100,000, was incorporated, an indication rather than a proof of increased prosperity, for in about two years it failed. It was followed by other and more stable institutions. On December 27, 1848, the Erie railroad was completed to Binghamton, and two years later to lake Erie. This gave the village increased prosperity, which became still greater with the completion of the Delaware, Lackawanna, and Western, the Syracuse and Binghamton, the Albany and Susquehanna, and the Chenango Valley or Utica railroads, which followed in a few years. In 1849 a telegraph line was built connecting the village with Oswego. The railroads and canals aided farming, the leading industry in the surrounding country, and made Binghamton not only a large railroad center, but also a prominent manufacturing place. On April 9, 1867, Binghamton was made a city. Its leading manufactures are cigars and tobacco, boots and shoes, combs, scales, carriages, pottery, etc., while in the twenty years since 1860 its population has more than doubled. The following account of Binghamton in 1880, which is as full as it could be made with the very slight assistance afforded by the city authorities, will show the present condition of the city.

BINGHAMTON IN 1880.

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

LOCATION.

Binghamton is situated in latitude $42^{\circ} 7'$ north, longitude $75^{\circ} 56'$ west from Greenwich, at the junction of the Chenango and Susquehanna rivers, neither of which is navigable at this point. The average altitude of the city above the sea-level is 850 feet, the highest point being 920 and the lowest 820 above the sea-level.

RAILROAD COMMUNICATIONS.

The following railroads pass through or into the city:

Erie railroad, termini New York and the West.

Syracuse, Binghamton, and New York railroad, termini Syracuse and New York.

Utica or Chenango Valley railroad, termini Binghamton and Utica.

Albany and Susquehanna railroad, termini Albany and Binghamton.

Delaware, Lackawanna, and Western railroad, termini Binghamton, New York, and Philadelphia.

TRIBUTARY COUNTRY.

The country surrounding Binghamton comprises the rich agricultural valleys and the well-cultivated slopes of the adjacent mountains within a radius of 50 miles. Butter and cheese are important staple products. Wheat, corn, potatoes, and buckwheat are raised in sufficient amount for home consumption, with a moderate surplus for exportation. Lumber, consisting of pine, hemlock, oak, chestnut, and ash, is extensively manufactured, while large taneries and pyroligneous acid works are located in adjoining towns, and are a source of revenue of Binghamton.

TOPOGRAPHY.

The Chemung and Catskill groups of the New York mountain system crop out in several places, especially in the elevations on either side of the valley in which Binghamton lies. The soil is a gravelly loam, with a subsoil of alluvial deposit of coarse gravel and sand. The variations of level are from 10 to 60 feet above the river-bed. The natural drainage is excellent, owing to the character of the soil and the course of the Chenango and Susquehanna rivers. There are no marshes, ponds, or lakes within the city limits or in the immediate vicinity.

CLIMATE.

No regular records of the temperature seem to have been kept. The highest summer temperature is said to be 110°, while the lowest winter temperature is stated as —36° (1873). The highest and lowest temperatures in average years are not given. The elevated lands and the rivers tend to make the climate milder than that of other places of the same latitude.

STREETS.

Binghamton has about 42 miles of streets, 2 miles of which are paved with wood, the rest being unpaved. The cost of the wood pavement per square yard is \$2 60. In the year ending February 10, 1879, the expense of all work upon the streets was \$4,140 31. The sidewalks are generally of plank, but there are about 5 miles of stone walks. The gutters vary from 8 to 12 inches in depth, and are wholly unpaved. Trees are planted quite generally throughout the city, in the space between the walks and the curbstones, at distances of from 20 to 50 feet. The construction and repair of the streets is done wholly by day labor. There is about 5½ miles of street-railway, using 13 cars and 22 horses and employing 9 men, and carrying, during 1879, 217,199 passengers, at fares of 5 cents. One omnibus is in use, having 4 horses, hiring 1 man, and carrying during the year 15,363 passengers, at fares of 5 cents.

WATER-WORKS.

The total cost of the public water-works was \$221,000. The supply is distributed by the Holly system, giving a pressure of 45 pounds to the square inch. During the past year the total number of gallons pumped was 619,173,500 gallons, the average daily amount being 1,691,731 gallons. The average cost of raising 1,000,000 gallons 1 foot high is 6 cents. The cost of maintenance, aside from pumping, is about \$4,000. The income from water-rates during the past year was \$28,520 16. Five water-meters are in use—3 Gem and 2 Union meters—and when they are used effect a great saving of water. There are 23 miles 4,020 feet of pipes and mains and 171 hydrants.

GAS.

The city is supplied with gas by a private corporation. The daily average production is 30,000 cubic feet, and the price charged per 1,000 feet is \$2 50. The city pays \$17 a year for each gas street-lamp, 131 in number.

PUBLIC BUILDINGS.

The city owns and uses Fireman hall for city offices and fire-department purposes, and one building for a hose company. The total cost of buildings belonging to the city is \$12,000. The value of the public-school houses was not reported.

PUBLIC PARKS AND PLEASURE-GROUNDS.

Binghamton has two public parks. *Ross Park* is situated in the southern part of the city, on the south side of the Susquehanna river, about 1½ mile from the city center, and contains 96 acres. The surface is very uneven, hills, gorges, glens, and level plateaus following one another in rapid succession. The grounds about the county house, in the heart of the city, are laid out as a park, covering about 9 acres. *Ross park* was presented to the city by Mr. Erastus Ross, and has cost the city for its maintenance about \$6,000. The parks are controlled by a board of park commissioners appointed by the common council.

PLACES OF AMUSEMENT.

There is but one theater in the city; this building, originally intended for a church, was changed into a theater, and is known as the Academy of Music; it seats about 700. Lester's hall, seating from 1,200 to 1,300, and Fireman hall, seating 500, are used for lectures and concerts. There are no concert- or beer-gardens in the city.

SEWERS.

No information on this subject was obtained from the city authorities.

CEMETERIES.

The map of the city shows only 2 cemeteries in Binghamton:

Spring Forest Cemetery is situated in the northwest corner of the city.

Old Cemetery is situated on Eldredge and Liberty streets, in the eastern central part of Binghamton.

As the schedule of questions in regard to cemeteries sent to the city authorities was not returned, no further information on this subject can be given.

MARKETS, ETC.

As to markets, sanitary authority, municipal cleansing, and police and fire departments, no detailed information was furnished.

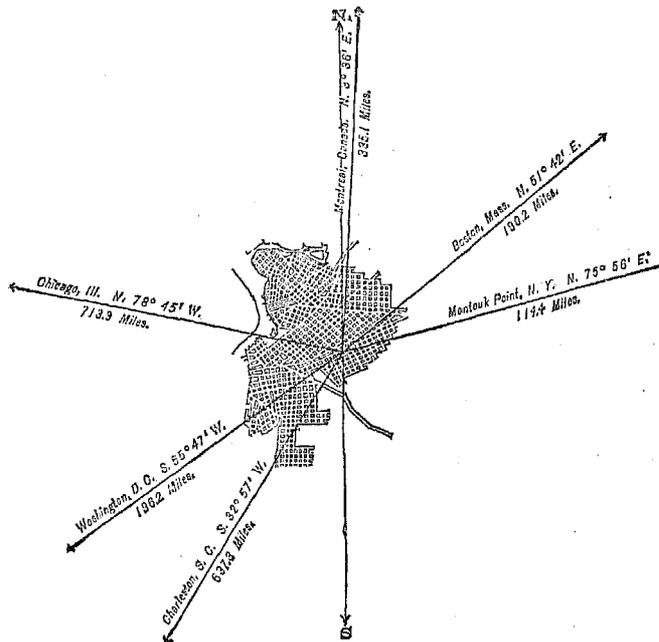
BROOKLYN,

KINGS COUNTY, NEW YORK.

POPULATION

IN THE
AGGREGATE,
1790-1880.

	Inhab.
1790.....	1,603
1800.....	2,378
1810.....	4,402
1820.....	7,175
1830.....	12,406
1840.....	36,233
1850.....	96,838
1860.....	266,661
1870.....	396,099
1880.....	566,663



POPULATION

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

Male.....	272,248
Female.....	294,415
—	
Native.....	388,969
Foreign-born.....	177,694
—	
White.....	558,427
Colored.....	* 8,236

*Including 121 Chinese and 20 Indians.

Latitude: 40° 41' North; Longitude: 73° 59' (west from Greenwich); Altitude: 0 to 202 feet.

FINANCIAL CONDITION:

Total Valuation: \$232,925,699; per capita: \$411 00. Net Indebtedness: \$38,040,000; per capita: \$67 13. Tax per \$100: \$2 61.

HISTORICAL SKETCH.

The following sketch is culled from the article on Brooklyn by Alden J. Spooner, esq., in *Johnson's Cyclopaedia*: Brooklyn was named from Breuckelen ("marshy lands"), in the province of Utrecht, in Holland, 6 miles from the city of Utrecht, from which some of its earliest settlers came. The first step toward its settlement was the purchase from the Indians, in 1636, by Willem Arianse Bennet and Jaques Bentyn, of a tract of 630 acres, lying at Gowanus, between 27th street and the New Utrecht line; the second step was the purchase, by Jorris (George) Jasen de Rapalje, of 325 acres at the Wallabout bay, June 16, 1637.

At the time of the discovery of the Long Island shores, in 1609, by Hendrik Hudson, several tribes or settlements occupied Long island, one of which was at Canarsie, and another, the Mareckawick tribe, at Brooklyn, which, from the spot where they were located ("sandy place or shore"), at the Wallabout, gave the name Mareckawick to that locality. Brooklyn heights, overlooking the East river, was called in the Indian dialect "*Ihpetonga*" (highlands). The first ferry was established by license in 1642, running from Peck slip to a point near the present Fulton ferry, from this period named "the Ferry". There were at that time five hamlets—"the Ferry", "Breuckelyn", near present Hoyt or Fulton street, where stood the church; "Gowanus", around Gowanus bay; "Bedford", inland, and "the Wallabout", around Wallabout bay. The first house known to have been built in Brooklyn was that of Willem Arianse Bennet, located on land purchased by him and Jaques Bentyne from the Indians prior to 1643, as in that year it was burned by the Indians. It was replaced by the Schermerhorn house on or near the same site; and the second, probably that yet standing and known as the De Hart or Bergen house, which was existing and visited by the Labidists in 1680, being then occupied by Simon Aertsen de Hart, grantee of Bennet. George Jansen de Rapalje did not come over from New Amsterdam to occupy his farm until about 1654. Later history has entirely exploded the story that his daughter, Sarah Rapalje, was the first Christian child born in New Netherlands, and also that her birthplace was Brooklyn, at the Wallabout. The Labidist manuscript, published by the Long Island Historical Society, shows that this distinction of first birth in the colony probably belonged to a male person, Jean Vigne, who was born in New Amsterdam in 1614, eleven years before the birth of Sarah, in 1625. Besides, it is clear that Sarah, instead of being born at the Wallabout, as often asserted by early historians, was born in Albany (Fort Orange), removed with her parents to New Amsterdam in 1626, lived there until after her marriage, between the age of 14 and 15, was a church member in New York, and united with the Brooklyn church by certificate in 1661; was twice married in the Wallabout, gave birth to 14 children, and died in 1685, aged about 60 years. There is no proof that any white person lived upon Long island prior to 1636.

Immediately upon the establishment of the ferry, in 1642, grants of building-lots at the point began, and that locality, as well as the other hamlets, increased. The union of all the hamlets into one incorporated jurisdiction, named Breuckelen, took place in 1646, under Director-General Kieft. The Labidists, who crossed this ferry in September, 1679, speak of it as "a considerable thoroughfare", and say:

A considerable number of Indians live upon Long island, who gain their subsistence by hunting and fishing; and they, as well as others, must carry their articles to market over this ferry, or boat themselves over, as it is free to every one to use his own boat if he have one, or to hire one for the purpose. The fare over the ferry is three stuivers in German (less than half a cent, English) for each person.

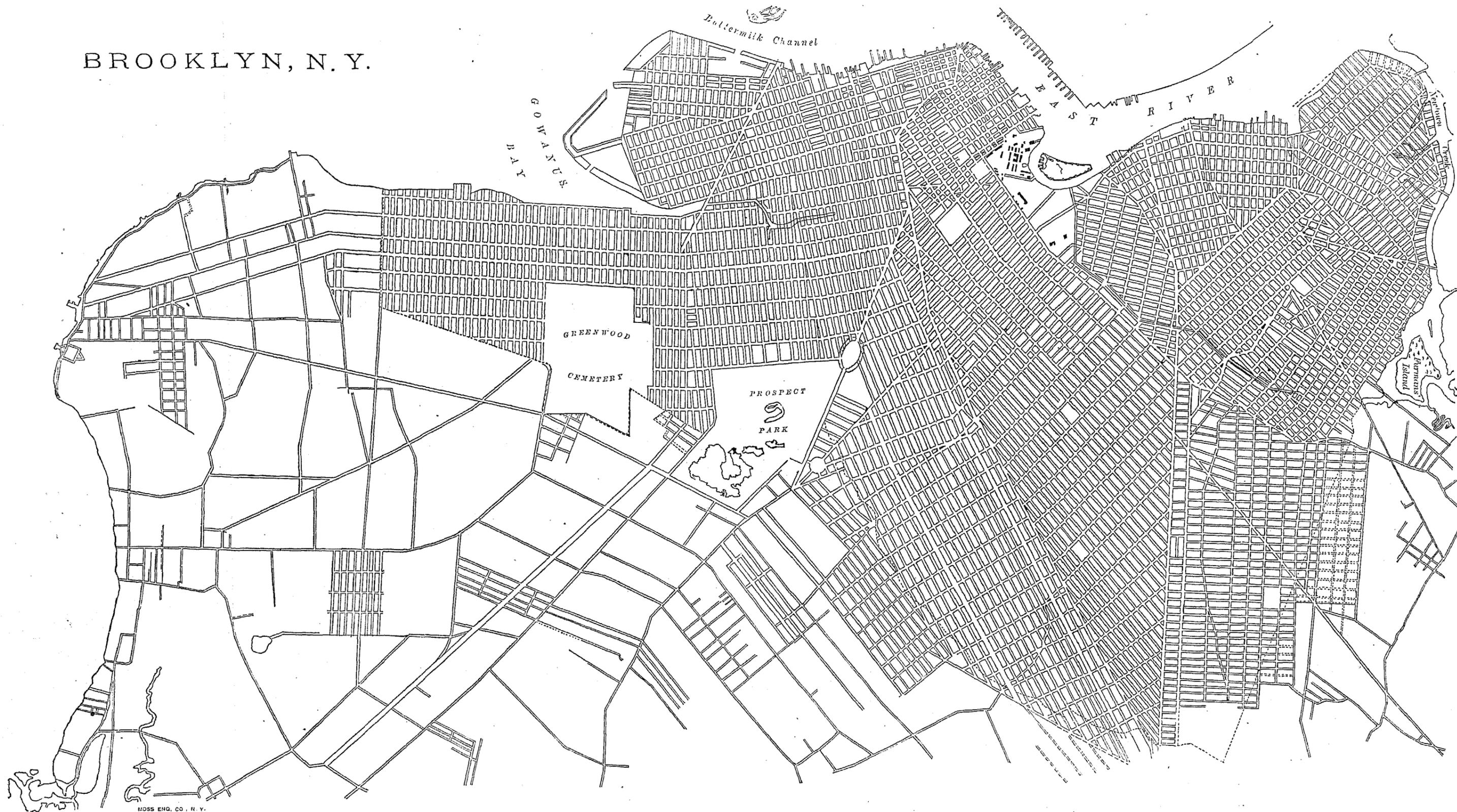
In 1665, Breuckelen had attained the leading position among the towns in point of population and wealth, and was granted the privilege yearly of "a fayre and market near the ferry for all graine, cattle, or other produce of the country". Whatever the increase of population, it must have been very gradual, as (to skip a long period) the canvasser for the *New York and Brooklyn Directory* in 1796, passing up "the old road" (Fulton street), and down "New Ferry" (Main street), and through the intervening streets, gives but 125 names. The statistics of population, and the picture painted by Francis Guy of its condition up to 1820, also show that at this time it held but the rank of an inconsiderable village, without institutions, commerce, or manufactures.

Over the spaces now occupied by Prospect park, Washington park, Greenwood cemetery, Evergreen and Cypress Hills cemeteries, was fought on the 27th of August, 1776, the important battle which has been properly designated "the battle of Brooklyn", the first great battle of the Revolution after the declaration of independence. The British army was under the command of Lord Howe, the Hessian army under General Von Heister. General Greene being ill, General Putnam was in command of the American forces. The result is very well known. An important pass was left unguarded on Howard's hills, just beyond Bedford, by which the English troops gained the rear of the American army, and defeated it with heavy loss. Those who escaped within the lines were rescued by the masterly retreat effected by General Washington on the 28th to New York, by means of boats and under cover of a heavy fog, by which their movements were concealed. A memorable incident of this battle was the death of General Nathaniel Woodhull, of Suffolk county, Long Island, while engaged, on the 28th, the day after the battle, in driving the cattle eastward. He had entered the "Increase Carpenter's house", 2 miles east of Jamaica. While there a body of horsemen rode up, commanded by Captain Oliver de Lancey, who struck the general several times with his sword, and wounded him so severely that he died a few days after at New Utrecht, where he had been conveyed as a prisoner.

Brooklyn navy-yard was begun with the purchase by the United States government of 40 acres in 1801, which were converted into a navy-yard, and which was designated, in 1824, by the Secretary of the Navy, as one of the first-class navy-yards of the nation. It has since added largely to its domain by other valuable purchases, upon which are placed the United States hospital, a dry-dock, and costly buildings for the repair and construction of the largest vessels.

The war of 1812.—On August 9, 1814, the patriotic citizens of Brooklyn and the surrounding country flocked to fort Greene, and aided in rehabilitating that old fortification and following out the line of earthworks across the island, conformably to the plans of General Joseph G. Swift, after whom one of the forts which cornered on Atlantic

BROOKLYN, N. Y.



street (the "Cobble Hill fort" of 1776) was named "fort Swift". Every preparation was made to meet the dangers to which New York was liable from her exposed situation by sea and land. By these precautions, or otherwise, Brooklyn did not, as in the Revolution, bear the brunt of the first systematic strategic conflict.

The civil war of 1861-'65.—In this emergency the city of Brooklyn was not exceeded by any other city in raising regiments and supplying material aid. Her sanitary fair of February 22, 1864, was extraordinary as an effort of local unity and successful enterprise, the pecuniary realization reaching the magnificent sum of \$402,943 74. This was aptly characterized as the first great act of self-assertion ever made by the city of Brooklyn, and did much to bring her citizens together for other efforts.

The village charter of Brooklyn is dated April 12, 1816; the first city charter was passed April 8, 1834; the consolidation act uniting Williamsburg and Green Point with it passed April 17, 1854, and took effect January 1, 1855. The new charter was passed in 1873, and went into effect the same year. The institutions which have had the greatest influence upon the social organization and material progress of the city have been the Apprentices' Library and Graham Institute (founded July 4, 1825), the Academy of Music (opened January 15, 1861), the Mercantile Library Association, the Atlantic docks, and the Long Island Historical Society.

BROOKLYN IN 1880.

LOCATION.

Brooklyn, the "City of Churches", is situated at the western extremity of Long Island, being divided from New York by the narrow strait, here about one-third of a mile wide, called "East river". In size it is, as it has been since 1860, the third city of the United States. Its geographical position is latitude 40° 41' north, longitude 73° 59' west from Greenwich. Its situation is a most favorable one, its harbor and water facilities being essentially identical with those of New York (which see). While, in proportion to its area, the water front is not so great as that of New York, it is yet very large, there being on its western boundary 8½ miles occupied by piers, slips, warehouses, boat- and ship-yards, ferries, etc. As a place of storage for the grain supplies of the large cities surrounding it, and of grain for export, it holds very high rank.

RAILROAD COMMUNICATIONS.

Brooklyn is practically the terminus of the following-named railroads, which comprise all upon Long Island:

Brooklyn, Bath, and Coney Island railroad, running from Greenwood to the last-named resort, 7 miles distant.

Brooklyn, Flatbush, and Coney Island railroad, running from Atlantic avenue to the same place, 7½ miles distant.

Brooklyn and Rockaway Beach railroad, running from East New York (in Brooklyn) to Canarsie landing, distant 3½ miles.

Brooklyn and Jamaica railroad, running between the points named, 9.68 miles, and operated as a part of the Long Island railroad.

Flushing, North Shore, and Central railroad, running from Hunter's Point to Central Junction, distant 15.93 miles, and having the following branches: From Woodside to Flushing, 3.99 miles; Whitestone Junction to Whitestone, 4 miles; Great Neck Junction to Great Neck, 6.74 miles; Bethpage Junction to Babylon, 8.16 miles—in all 22.89 miles; making a total length of 38.82 miles, all leased to the Long Island Railroad Company.

Kings County Central railroad, running to its junction with the New York, Bay Ridge, and Jamaica railroad, distant 3¼ miles, and leased to that road.

Long Island railroad, running from Long Island City (Hunter's Point) to Greenport, 97.78 miles distant, where it connects by steamer with Shelter and Block Islands and with Newport, Rhode Island. It has branches 63.50 miles in length, and leases 167.33 miles. The main line, from Jamaica to Greenport, 84 miles, was chartered April 26, 1834, and opened July 29, 1844. The Brooklyn and Jamaica railroad, leased from its completion in 1836, continued the line into Brooklyn as late as 1861, when the present line to Long Island City was built.

Marine railway, running from Manhattan Beach hotel to Sheep's Head Bay inlet, also to Brighton, 5 miles distant.

New York, Bay Ridge, and Jamaica railroad, running from Bay Ridge to New Lots, 8.16 miles distant, leased to the New York and Manhattan Beach Railroad Company.

New York and Manhattan Beach railroad, extending from Green Point to Manhattan Beach, distant 14.79 miles, leases the New York, Bay Ridge, and Jamaica railroad, 8.16 miles, making a total length of 22.85 miles.

New York and Rockaway railroad, running from Rockaway Junction to Far Rockaway, 8.91 miles distant, leased to the Long Island Railroad Company.

New York, Woodhaven, and Rockaway railroad, extending from Hunter's Point to Rockaway Beach, 11.75 miles away, with a junction to Far Rockaway of 3.50 miles, making its total length 15.25 miles.

New York and Sea Beach railroad, extending from Bay Ridge to Coney island, a distance of 6 miles.

Southern Railroad of Long Island, running from Bushwick to Patchogue, distant 51.58 miles, with 16.30 miles of branches, making a total length of 67.88 miles; it was organized in 1860 as the South Side railroad, leased under the present title in 1876 to the Long Island railroad.(a)

There are five ferry companies, with twelve ferries, crossing the East river, and it is estimated that they carry over 100,000,000 passengers yearly.

A suspension bridge is now in course of erection to connect Brooklyn and New York city.(b)

TOPOGRAPHY.

Long Island, upon the western extremity of which the city of Brooklyn is located, extends in an easterly direction about 114 miles, with a varying width of from 10 to 20 miles. Geologically considered, the island is of very recent origin, having been formed almost wholly by glacial agency. If any portion of it were in existence prior to the glacial epoch, it has been extensively modified and augmented by the eroding and transporting power of the vast field of ice which, extending from the far north, found its terminus in the warmer waters of the Atlantic. Upon the western end of the island the origin of the materials of which it is composed is especially evident. The ground is full of worn masses of stone, with surfaces often deeply scored by obstacles over which they have been urged with resistless force during their transportation. Side by side with bowlders of trap from the Palisades, dark trap and sienites from the Hudson highlands and the Taconis range, with occasional masses from the Lower Helderberg with their characteristic fossils, lie the gneiss and marble of Westchester, the slaty shales of the Hudson group, the red sandstones of New Jersey, and many other varieties of rock, the counterparts of which still abound northward and northwestward of the island. These, mixed in extreme confusion and packed with the water-worn particles of their *débris*, comprise what is known to geologists as the unmodified drift. Throughout the entire length of Long Island runs an irregular chain of hills from 150 to 384 feet in height, the northern spurs of which form the abrupt and diversified North shore, while on the south the surface slopes gently away toward the sea, terminating in a gravelly plain which skirts the shores of the bays with a varying width of from 5 to 15 miles. The material composing the ridge of hills is made up of the compact drift already described. Bowlders are everywhere abundant, and isolated beds of clay fill many of the depressions on the elevated grounds, rendering them quite impervious to water. This character is lost as the slope descends, and layers of fine uniform-grained sand, beds of pebbles and gravel, and occasionally local deposits of clay in thin strata, characterize the ground to great depths. Through this porous material the water flows toward the ocean, bursting forth at various points in springs, forming streams of singular clearness and purity. It is from the larger of these streams that the water-supply of Brooklyn is derived.

CLIMATE.

Highest recorded summer temperature, 96°; highest summer temperature in average years, 93°. Lowest recorded winter temperature, -2°; lowest winter temperature in average years, 5°.

Though these figures differ slightly from those in the "Climate of New York", there is practically but little difference in the temperature of the two cities.

STREETS.

The total length of Brooklyn's streets is 546.29 miles, of which there are paved with cobble-stones, 320.62 miles; with Belgian blocks, 13.96 miles; with granite blocks, 13.45 miles; with asphalt or other composition, 9.49 miles; with wood, 1.05 mile; and with gravel or macadam, 7.36 miles. The cost per square yard of each, as nearly as it may be estimated, is: Cobble-stones, 45 cents; Belgian blocks, \$1 10; granite blocks, \$2; wood, \$2 50; macadam, \$1 09. Upon cobble-stone pavements there is annually expended for repairs about \$200 per mile, and on asphalt about 5 cents per square yard. The order of the relative facility with which each is kept clean is: 1, asphalt; 2, granite and Belgian blocks; 3, cobble-stones. Granite, as to quality and permanent economy, is considered to rank first.

Sidewalks are paved with bluestone flagging. Gutters also are laid with bluestone blocks, 14 inches wide and about 4 feet long. There is practiced by property-owners a certain amount of tree-planting in front of their premises at the curb-line.

The construction and repair of streets is done both by contract and by the day, the former, when practicable, being preferred. The cost of repairing streets for the last three years was as follows:

1878.....	\$82,441 25
1879.....	72,260 44
1880.....	58,647 06

Neither steam stone-crusher nor roller is used.

a The passenger station of the Long Island railroad and leased lines is located at Hunter's Point, and connects by ferries to New York for Thirty-fourth street and James slip. The remaining roads are mainly "summer lines", with no regular traffic.

b Completed since 1880.

HORSE-RAILROADS, ETC.

Of these there is a total length of 151 miles; 1,184 cars and 4,807 horses are employed; the rate of fare is 5 cents, and there are annually carried about 67,000,000 passengers.

There are no omnibus lines in Brooklyn.

WATER-WORKS.

The first known agitation of the water question in Brooklyn occurred in 1834. The first proposition was to sink wells near the foot of fort Green, from which the water was to be forced by steam-pumps to a reservoir at the summit of the hill. The project, however, was not acted upon. It was revived in 1847, being the subject of a committee report which advised the construction of immense wells at the foot of the hills at the rear of the city, the water to be raised to a reservoir 40 feet above the tops of the houses on the heights. Again, two years later, the well system was advanced, but received a severe blow through the report of Dr. Torrey that the Brooklyn well water contained $18\frac{1}{2}$ grains of solid matter to the gallon— $14\frac{1}{2}$ grains more than the Croton water.

At the same time plans were under consideration for a supply from the country streams, including an engine and stand-pipe at each mill-pond, forcing the water through iron pipes to a pump-well at Flatbush, whence it was to be pumped to a reservoir upon Prospect hill. Still nothing was done. In 1851 a committee on the question secured from William J. McAlpin a report on the extent of the water-supply and the mode of introducing it.

Dams were to be placed at Jamaica, Nostrand's, Springfield, and Simonson's streams, and their waters carried by conduits into Baisley's pond; thence in a large conduit 9 miles to Flatbush, whence it was to be pumped into an oval reservoir of 60,000,000 gallons capacity upon the summit of Prospect hill. The minimum capacity of the works was to be 10,000,000 gallons per day, and the total cost, including a Cornish pumping-engine and 75 miles of distributing pipe, \$3,500,000. It was decided to submit this plan to the popular vote on January 27, 1852; but a few days previously to that date the election was deferred to revise and mature the plans by means of more elaborate surveys.

In the mean time a company known as the Williamsburg Water Company had secured a charter, with the view of supplying Williamsburg alone, and had purchased several of the ponds for that purpose.

In 1853 this company obtained an amendment to its charter, changing its name to the Long Island Water Company, increasing its capital from \$500,000 to \$3,000,000, and authorizing it to furnish a water-supply to Brooklyn also.

The election previously alluded to as deferred was held on July 11, 1853, and resulted in a rejection by the people of the proposed plan by a vote of 5,054 to 2,639. In 1854 a new water committee was appointed, and a new plan based upon former surveys was prepared for submission to the people. This plan contemplated a supply from all of the streams west of Parsonage creek at Hempstead, the overflow from dams to be erected upon them to be conducted in an open canal to Baisley's pond, thence to flow through a closed conduit to a pump-well situated near Spring creek, whence it was to be pumped into a reservoir upon the hill above. The works were to have a capacity of 20,000,000 gallons per diem when opened, and to be capable of a future increase to 40,000,000 gallons. The cost of the whole was estimated at \$4,500,000. This plan was voted upon June 1, 1854, by the citizens, who again rejected the proffered supply by a vote of 9,105 to 6,402. At about this time the well system again found its advocates, but was finally disposed of by the report of J. S. Stoddard, civil engineer, which demonstrated that not more than 1,000,000 gallons per diem could be obtained through wells from a drainage area of 30 square miles.

In March, 1854, an offer was made by H. S. Welles & Co., contractors, to construct the works according to the plans last voted upon, for the sum of \$4,175,000; but as no arrangement could be made with the Long Island Water Company, which still held the ponds and reservoir site, this offer was not entertained. In 1855 a company was chartered under the name of the Nassau Water Company, with power to construct works and to supply the city with water. Their plans included an open canal from Jamaica pond, designed to intercept all of the smaller streams between the pond and the pumping-engines. On the 1st of January, 1855, the new city charter, incorporating Williamsburg and Bushwick with Brooklyn, came into effect, giving a fresh impetus to the water question. Under the authority conferred by the charter, negotiations were established between the Nassau Water Company and the city, the result of which was an arrangement whereby the city obtained a controlling power in the directorate of the Nassau company by the subscription of \$1,300,000, the company to conduct the construction of the works in trust for the city pending the passage of a law enabling the latter to assume absolute proprietorship. A contract was at once entered into with H. S. Welles & Co. to construct works guaranteed to yield 20,000,000 gallons per day, within two years from the date of contract. On the 31st of July, 1856, the beginning of the works was formally inaugurated by breaking ground for the Ridgewood reservoir. From this time the work of construction rapidly progressed, until March, 1857, when a change in the character of the conduit east of Jamaica was found advisable, it having proved impossible, in the unstable sands, to construct or maintain an open canal that would continue reliable and efficient. Through delays attendant upon this change in the plan, operations upon this portion of the work were held in abeyance for more than a year. The remainder, however, were actively pushed to completion; and on December 12, 1858, the long-looked-for supply was placed at the disposal of

the citizens of Brooklyn. Thus, after a twenty-five years' agitation of the water question, its solution was ultimately attained, and the people have continued uninterruptedly to enjoy the convenience and protection of an agent which has contributed more than any other to the advancement of the growth and prosperity of the city.

The area included between the ridge and the lowest limit at which the water of the streams is economized for the supply of Brooklyn comprises about 60 square miles, and constitutes the drainage basin in which the rainfall is collected.

As before stated, the original design contemplated the construction of an open canal from Jamaica eastward, with branches to each of the ponds; but this idea was abandoned as soon as the actual construction of a portion had demonstrated its inefficiency, and a substantial closed conduit of masonry was substituted throughout the entire length. Beginning at Hempstead, provision was made for carrying the 8,239,947 gallons derivable from Hempstead pond, together with 20,000,000 gallons that might be subsequently collected from points farther eastward; the conduit at this point having a width of 8 feet 2 inches and a height of 8 feet 1 inch, and a slope or inclination of the bottom of $6\frac{1}{2}$ inches per mile. At the entrance of the branch conduit from Rockville pond the dimensions increase to 8 feet 8 inches; at the junction of the Valley Stream branch to 9 feet 2 inches; at the junction of Clear Stream branch to 9 feet 4 inches; at the junction of Brookfield branch to 9 feet 8 inches; while from Jamaica pond to the pump-well the width is uniformly 10 feet, and the height from invert to crown of arch is 8 feet 8 inches, and the inclination of the bottom is 6 inches per mile. This latter portion of the conduit is capable of delivering, with 33 inches depth of water, 20,000,000 gallons, and, with 5 feet depth, 47,000,000 gallons of water in twenty-four hours. The low level of the ponds and the rate of slope made deep cutting necessary, especially on approaching the pump-well. Through the whole distance the excavation was carried below the water-level of the country, rendering the construction much more difficult. Portions of the bottom were found insecure, and resort was here had to pile foundations, while in other parts platforms of timber were used to afford a firm bearing for the structure. The conduit is supported upon a bed of concrete 15 feet wide. On the lower reach, between Jamaica and the pump-well, the sides are of stone, 3 feet high, with an interior lining of brick-work. The bottom is an inverted arch of brick 4 inches thick, with a versed sine of 8 inches. The top is a brick arch 12 inches in thickness. The stone used is mostly gneiss rock from Greenwich, Connecticut. At convenient points along the line manholes are added, either upon the top or on the side of the conduit, affording access to the interior for inspection or for repairs. Not far from the pump-well the water found was so considerable that openings were left in the conduit to admit it. These openings, 30 in number, are estimated to be capable of yielding over 1,000,000 gallons per day. At Spring creek, as well as at a point about a mile beyond, and at Jamaica, Valley Stream, and Rockville creeks are waste-weirs over which the surplus water escapes. Here, also, are sluice-gates for draining the water from the conduit entirely when repairs become necessary. The construction of the upper reach of the conduit differs only in the omission of the inner lining of the side-walls, which at several points are made wholly of brick, and an increase in the thickness of the bottom to 8 inches. For almost the entire length the conduit is covered with 4 feet of earth, sloping on the sides at the rate of $1\frac{1}{2}$ horizontal to 1 perpendicular for the lower reach, and 2 horizontal to 1 perpendicular on the upper. Wherever the line has intercepted the course of streams inverted culverts have been built to carry the water beneath the bottom. At the pump-well the conduit terminates in an arched basin 52 $\frac{1}{2}$ feet long, at right angles to its course, and connecting with the pump-well by four sluices. The total length of the conduit is 12.39 miles, 7.5 miles of which is 10 feet wide and 8 feet high—sufficiently large to drive a carriage through with ease.

The pump-well, from which the water is drawn by the engines, is built of heavy granite masonry laid in courses with hydraulic mortar. The bottom, also of granite in radial courses, rests upon a bed of concrete, beneath which is a heavy platform of timber. The surface of the bottom is 2 feet below the bottom of the conduit. The interior of the pump-well is divided into compartments by cross-walls, to admit of the examination and repair of either pump without interfering with the other.

On the crest of the ridge above the engine-house is the Ridgewood distributing reservoir, covering, with its slopes, embankments, and grounds, a plot of 48 $\frac{1}{2}$ acres. It is built in two divisions, the areas of which, when full, are 11.85 and 13.73 acres, or, together, 25 $\frac{1}{2}$ acres. Its water-surface, when filled to a depth of 20 feet, is 170 feet above high water. The embankments contain puddle-walls extending 2 feet higher than the level to which the reservoir is filled, and the bottom is covered entirely with a puddle of clay and earth found upon the spot. The inner slopes are paved with broken boulder-stone upon a bed of stone chips and gravel. The water flows from the bell-shaped mouths of the force-mains into a structure of heavy stone masonry, termed the influx-chamber, from which it flows over an apron and into each compartment of the reservoir. In traversing the distance of 1,200 feet the velocity of the stream is quite lost, and ample time is afforded for the deposit of any sediment that may be held in suspension. At the effluent chamber are two massive granite walls with four sluice-ways in each, through which the water passes into the chamber and thence into the mains. Separating the effluent chamber from the stop-cock chamber is a heavy wall of cut stone 6 feet in thickness, into which are set the mouth-pieces of three mains, each 36 inches in diameter. Only two of these mains are in use at the present time, the admission of water to them being controlled by two large gates or stop-cocks in the stop-cock chamber. Before entering the effluent chamber the water passes through screens of copper wire, which arrest all floating matter of considerable

size. Drain-pipes, 12 inches in diameter, to drain the compartments for repairs, pass through the stop-cock chamber where their valves are placed. Of the two divisions the western is the larger, containing, when filled to a depth of 20 feet, 86,651,382 gallons. The eastern division holds 74,439,062 gallons. The total capacity of the reservoir is 161,090,444 gallons, which at the present rate of consumption is equal to about one week's supply.

There are certain portions of the city in the vicinity of Prospect park that lie so near to the level of the Ridgewood reservoir that the water will not flow thence to them, or, at best, will furnish only a limited supply during the night. For the accommodation of those the Mount Prospect reservoir was built and the Mount Prospect engine was erected. The engine is of the crank and fly-wheel pattern, with a steam-cylinder 24 inches in diameter and $4\frac{1}{2}$ feet stroke, and the two pumps are each 20 inches in diameter and $3\frac{1}{2}$ feet stroke.

On a commanding eminence near the main entrance of Prospect park is located Mount Prospect reservoir. Its part in the system of water-distribution is to furnish, under a serviceable pressure, a proper supply of water to that portion of the city lying south of Atlantic avenue and east of Fifth avenue, which is too near to the level of Ridgewood reservoir conveniently to draw its supply from that source. The reservoir grounds cover 11 acres, three-quarters of which is occupied by the reservoir and its appurtenances.

When the water was first generally introduced, the average daily consumption barely exceeded 4,500,000 gallons, or at the rate of 25 gallons per day for each inhabitant. This consumption has continually increased, not alone in its total amount, but also in the rate proportioned to the population. The total cost to date (1880) has been \$11,216,500. During 1879 the average amount pumped per diem was 32,900,000 gallons, the greatest being 47,900,000 and the least 26,000,000 gallons. The average cost of raising 1,000,000 gallons 1 foot high is 4.34 cents. The yearly cost of maintenance, not including interest on water debt (\$687,500), aside from cost of pumping, is \$136,000. The yearly income from water-rates is about \$1,000,000. A few water-meters, both piston and rotary, are used for manufactories and hotels.

GAS.

The gas-works are owned privately. The charge per 1,000 feet is \$2. The city pays for each of its 14,866 street-lamps \$23 per year.

PUBLIC BUILDINGS.

The city owns and occupies for municipal purposes the city hall, municipal-department building, police-station houses, and fire-engine houses. The total cost of municipal buildings belonging to the city was \$1,314,979 48, the city hall costing \$715,000 and the municipal-department building \$199,979 28.

PUBLIC PARKS AND PLEASURE-GROUNDS.

Brooklyn's parks and their areas are as follows:

	Acres.
Prospect park	505.80
Washington park (fort Greene)	30.17
Tompkins park	7.75
City park	7.50
Carroll park	1.80
City Hall park	1.50

In addition to these there are several small inclosures aggregating less than five acres belonging to the city which serve to adorn and benefit the neighborhoods in which they are located. Also the Kings County parade-ground, which is an area consisting of 40 acres, principally covered by a substantial turf. It was primarily designed for the use of the military of the county for occasional parades, but is used with but little interruption throughout the year for field-sports by the citizens of Brooklyn and New York. For convenience and adaptability it has probably no equal in the country, and has served directly to develop an unusual interest in the field-sports, such as base-ball, cricket, lacrosse, foot-ball, walking and running, pedestrianism, etc. A moderate maintenance fund is provided by the county.

The concourse at Coney island, in which the city of Brooklyn and Kings county are jointly interested, is also under the control of the Brooklyn park commission. It covers an area of about 70 acres, situated near the center of the island, and controls a beach front of 750 feet.

The cost of the land comprising Prospect park was \$5,143,762 73, approximately; this includes the purchase of 130 acres which were not used for park purposes, and which will eventually be sold, the proceeds to accrue to the benefit of the city. For construction purposes between \$5,000,000 and \$5,500,000 have been expended. On Washington park, which has been the property of the city since 1848, there has been expended for construction and maintenance \$200,000. Upon the smaller parks the work has not been extensive or costly.

The annual expenditure for the maintenance of the parks has varied from \$75,000 to \$100,000.

The estimated annual number of visitors to the larger parks on foot is 1,253,972; in carriages, 2,744,812; on horseback, 36,492.

The designers and engineers of the larger parks were Messrs. Olmsted, Vaux, Davis, Martin, Bogart, and Culyer.

The parks are under the control of a commission of eight members, and the mayor *ex officio*, which derives its power jointly from the legislature and from the city.

The following concerning the chief park (Prospect) is from the report of the park commissioners for 1880:

The use of the park by our citizens has been more general than the preceding year; there has been a noticeable increase in the use of the roads for pleasure-riding, both in carriages and on horseback.

The great advantage resulting from the park water-service, which is separate and distinct from that of the city, was specially demonstrated during the serious and protracted drought during the year. Had the park, parkway, and Coney island been dependent upon the city for a supply during the past season, there would have, without doubt, resulted great damage to the turf, shrubbery, and roads of the park, and the public would have been denied many conveniences which have been afforded by the liberal supply of water furnished by the park well.

The use of certain portions of our park drives is exceptional, particularly in summer and early fall, in view of the fact that they form a direct and very desirable communication by way of the ocean parkway with Coney island, and are very largely used for that purpose.

The commissioners continue to be more strongly impressed in each recurring year with the great value of the park as a sanitary and moral force, affording health, instruction, pleasure, and contentment to thousands—not to our adult population alone, but those who are growing up to take their places.

The thoughtful observer can hardly fail to be impressed with the fact that the park, maintained with wise economy, and sufficiently provided with means to keep it from shabbiness of appearance, and its resources fully developed, exercises all the beneficent and differing influences we have noted. It is a wholesale purveyor of healthful recreation at no cost to the individual; it enlists his sympathies and interest in the public welfare; it gives him a greater respect for his own citizenship, and elevates the entire plane of public morality, considered in its broadest sense; it gives welcome to the poorest, and, to those more favored by fortune, is a resort full of attractions.

Its facilities for pleasure and recreation in riding, driving, walking, boating, skating, for field-sports, picnics, etc., each in their season, are unrivaled in this country. Already its fame and beauty have been potent influences to bring and hold many good citizens to Brooklyn, and with prospective and enlarged conveniences for transit between our suburbs and New York the park will exert a greater force in the future.

PLACES OF AMUSEMENT.

Brooklyn has the following theaters, etc.:

Academy of Music.—Constructed in 1860. Size, about 75 by 250 feet; size of stage, 70 by 54 feet; cost without ground, \$185,000; with ground, \$230,000. Seating capacity—gallery, 1,000; balcony, 491; lowest floor, 942—total, 2,433. There are nine exits, all from the ground floor. The height of the auditorium ceiling is 60 feet. The academy is open only from September to June, and the style of entertainment is varied, embracing public meetings, theatricals, concerts, lectures, and religious services.

Brooklyn Park Theater.(a)—Constructed in 1874. Size of stage, 40 by 61 feet; cost with ground, \$140,000. Seating capacity—first floor, 700; second floor, 600; third floor, 700—total, 2,000. Each of the floors has exits as follows: First, 2; second, 3; third, 5—total, 10. The height of the auditorium ceiling is 64 feet. The average attendance is given as 1,200, and there are given annually 342 performances, including 86 matinées.

Williamsburg Academy of Music.—Built about 1870. Seats about 2,000, and is used for dramatic and operatic purposes.

Standard Museum Theater.—Constructed in 1872. Size, 50 by 190 feet; size of stage, 25 by 40 feet. Seating capacity, 1,000. There are 7 exits—5 from the first and 2 from the second floor. The height of the auditorium ceiling is 45 feet. The average attendance is given as 600, and there are daily given two performances. The performance given is of the sort known as "variety", and there is a museum attached.

Haverly's Theater.—Built in 1879. Size of stage, 67 by 50 feet. Seats about 2,000. There are 18 exits—10 from the first, 3 from the second, and 5 from the third floor. The height of the auditorium ceiling is 60 feet. Only first-class operatic and dramatic performances are here given. The average attendance at each of the 320 performances annually given is said to be 1,500.

Hyde and Behman's Theater.(b)—Constructed in 1879. Size, 135 by 160 feet; size of stage, 60 by 40 feet. Cost, \$80,000. Seating capacity, 2,200. There are 6 exits. The height of the auditorium ceiling is 45 feet. The entertainment is "variety"; 372 performances are given yearly, and the place is said to be "generally crowded".

DRAINAGE.

The system of sewerage which has been carried out in Brooklyn with considerable completeness is substantially that described in a report to the commissioners of sewerage by Mr. Julius W. Adams, the engineer of the work, March 19, 1859. This is one of the earliest examples of the extensive use of vitrified pipes for city sewerage. The controlling argument advanced by Mr. Adams for the use of what were then considered very small pipes is thus stated:

An argument has been brought against the system of small sewers, that they will require constant attention to avoid becoming choked by deposit, etc., whereas the larger brick sewers may, on the contrary, be neglected for a long time before the necessity of

^a This theater was built originally for stores and offices; subsequently a part of it was converted into a variety theater, and so remained until 1874, when Mr. W. E. Sims rebuilt it into a first-class theater, in which only operatic and dramatic entertainments are given.

^b This theater was formerly used as a market.

cleaning them arises. They will, it is true, require being attended to, so far at least as to allow a sufficient quantity of water to pass through them; but the advantages they offer of economy in cost and management, and the increased salubrity of the atmosphere in their neighborhood by reason of this constant cleansing, will far outweigh this inconvenience, if inconvenience it can be called, to compel city officials to attend to their duty. No amount of attention, however, short of lifting the contents into the open air and into the streets, will prevent the accumulation in the large brick sewers of pestilent-breeding abominations, the effects of which can not be measured by the dollar standard.

The following is a description of the arrangement of sewerage districts or divisions:

The city of Brooklyn covers an area of about 19 square miles. The drainage of this divides itself naturally into four divisions:

The northern division comprises all that drains into the East river north of Wallabout bay, or 4,350 acres.

The middle or eastern division comprises all the drainage into Wallabout bay, an area of about 3,922 acres.

The southern division comprises the drainage into Gowanus creek or bay, and covers an area of 2,000 acres.

The western division embraces all the drainage into the East river between Wallabout bay and Red Hook, an area of about 1,230 acres.

Northern division.—It will be seen * * * that a large district of the northern division has its drainage into Newtown creek, on the northern boundary of the division, and which sets up inland from the East river about 3 miles. It would be unsafe to establish a system of drainage based upon the supposition that this creek will preserve itself open because it has hitherto done so; all experience forbids this conclusion. The mere rise and fall of the tide alone, after the meadow-lands above are filled in, will not keep it open. Whenever, either from the wash from the upland—which is now held by the meadow above—or from the progress of settlement, the meadows become filled up, the creek will be without the backwater which, held by the meadows until late in the ebb, is efficacious in scouring the channel; and, as will be seen further on, the velocity of the ebb, save for a short time, will not be sufficient to prevent the sinking even of the lighter particles of sewage, which the flood tide would have barely force sufficient to lift or disturb in the center of the channel, in order to deposit in the eddies near the shore. Hence, without recourse to dredging or flushing, the creek will inevitably fill up, and, if not preserved from the polluting effects of the sewage, will gradually shoal, and become in process of time a filthy stagnant pool, the fruitful source of disease to the neighborhood. All experience elsewhere, under like circumstances, proves this; and the condition of the bottom at the mouth of the creek points to this result as a sure one, and at no distant day.

In locating the line of sewers for this district an eye was had to the future wants of the locality by making the outlet of the main sewer at a point on the creek with good water, about a mile and a half from its mouth. For some years the discharge could be made at that point without serious injury; but when the district becomes populous and the necessity shall be apparent for checking as far as possible the shoaling of the creek, an intercepting sewer can be extended from the termination of the sewer on the creek to its mouth, thus cutting off all discharge into the creek. As the grade of this extension will be level, or nearly so, it can be flushed from the upper reach of the creek, this being closed by a tide-gate, the upper basin being connected with the sewer by a sluice. By this means, at low water, the sewer may be effectually cleansed. The depth of water in the creek (18 or 20 feet at low tide), and the extent of water-front which it affords at little expense, will render its preservation from shoaling desirable, and but two methods offer to this end—flushing and dredging. The first is incomparably the cheaper and more efficient method, in which case the upper basin referred to will become necessary and commend itself to the property-owners as a necessary element in the improvement of the shores of the creek. Without a basin from which to flush at the last stage of the ebb, the creek will close itself. With convenience for flushing the lower reach of the creek, the extension of the sewer to its mouth might be postponed; but ultimately it will be called for, and hence is included in the plan.

Bushwick inlet offers too little inducement to make the effort to keep it open, and in fact streets have already been projected which, when graded, will close it. The plan for the drainage of this district looks to that fact.

Eastern division.—Whilst discussing the drainage of the northern and eastern divisions, mention may be made of the canal which exists (on paper) connecting Wallabout bay with Newtown creek.

This canal plan looks to flushing in both directions, viz, into Newtown creek and also into Wallabout bay, and requires a reservoir of about 2 miles in length at the summit, of 50 feet in width, and 8 feet in depth at high tide. This quantity of water was deemed necessary in order to impress upon the waters of the creek, at the proper time of ebb, a velocity sufficient to sweep all deposit into the bay and East river. Omitting all consideration of the intolerable nuisance which would necessarily follow from the construction of any canal in the heart of a populous district receiving the sewage of thousands of acres, and looking upon it simply in the light of a piece of machinery for the drainage of the district, we perceive at once it is cumbersome and uncertain, and, as it contemplates emptying a large body of sewage into Wallabout bay, would ultimately prove offensive, and call for the very method of interception which we now propose for the drainage of the district.

The drainage of 2,200 acres of city area, which, if the canal were constructed, would be discharged into Wallabout bay, we propose to intercept and discharge into the East river, in deep water, at Peck Slip ferry, and beyond the influences which would tend to cause a deposit from the drainage into Wallabout bay. Thus, by dispensing with the canal, the area drained into Wallabout bay may be reduced from 3,900 to less than 1,600 acres. It is true that the basin or reservoir at the head of this canal, instead of being made (as is proposed by the canal plan) a receptacle for sewage, would prove an efficient means for flushing the sewers; but it was not the design of the canal plan to serve such purpose, and could in no event prevent the sewage from the additional 2,200 acres from being deposited in Wallabout bay.

The intercepting sewer which we propose, in order to relieve Wallabout bay of the drainage of this 2,200 acres, can be flushed by tide-gates, as recommended in report of 9th December, 1857, the temporary outfalls of this sewer being then considered at the foot of Ann street; but it is highly desirable that when built it should be carried at once to its proper outfall at Peck Slip ferry, foot of South Seventh street.

The advantages of diminishing to this extent the area draining into this bay will be appreciated when we consider the enormous amount of sewage at a future day which would be poured from nearly 4,000 acres of city area, all of which would find its place in the waters of the bay, to be removed by the unwholesome process of dredging. We say all of it; for though recent sewage will float in water, all sewage after maceration (that is to say the insoluble parts) will sink in still water (its specific gravity being about 1.325) at the rate of about 1 foot per minute, and also in currents having a less velocity than 170 feet per minute, or a little less than 2 miles per hour. At velocities above 2 miles per hour the sewage is kept in mechanical mixture, ready to be deposited at the slack and in eddies near the shores.

Both the ebb and the flood in the East river produce a reverse current through Wallabout bay, and with diminished velocities, and consequently with eddies at the meeting of the tide-streams. The full flood in the center of the East river, opposite this bay, has a surface velocity, for about an hour, of $4\frac{1}{2}$ miles, and the currents through the channel of Wallabout have, for about the same duration, a surface velocity of a little over $2\frac{1}{2}$ miles per hour; hence sewage deposited at slack-water will not probably be disturbed by succeeding tides, or, if disturbed, the eddies near the bottom and toward the sides where the currents are slower will allow it to settle and accumulate.

In other words, sewage may be expected to deposit somewhere in this bay at nearly all stages of the tide. The bay requires the constant operation of the dredge to preserve a sufficient depth of water for the purposes of the United States navy-yard, located upon its southern shore; and although the government interest will doubtless preserve the channel open at whatever cost, yet the dredging yearly of thousands of tons of sewage-saturated silt will not enhance the value of the neighboring property or the healthfulness of the locality.

Southern division.—In expressing an opinion adverse to the construction of a canal between Newtown creek and Wallabout bay, it was that the circumstances of the case did not call for such complication. The method of interception would deliver the sewage into the deep water of the East river on the north of the district, and the same means applied south would carry the sewage into the deep water of the East river and beyond the shallows of Wallabout bay.

The canal, as we have seen, so far from benefiting the discharge of the latter-mentioned district, would cause a deposition of sewage on the shores of the latter bay, its projectors designing it for the purpose of scouring the creeks instead of flushing the sewers. Gowanus creek is closing from precisely the same causes as are in operation in Newtown creek, and the basin of Gowanus creek can not be used as the line of drainage for the district, as it opens into a shallow bay, exposed for many miles to the direct action of the prevailing winds in the summer months; hence, to drain this basin properly, the outlets of the sewer must be removed beyond the limits of Gowanus bay and of the influences which would set back the sewage on its shores. To do this, an intercepting sewer is proposed on the west side of the present creek on Gowanus canal, to discharge at or near Red Hook point, and one on the east side, discharging below the point of Gowanus bay.

The length of these sewers and their level grades will render flushing necessary. For this purpose, the upper reach of Gowanus creek, converted into a basin by a tide-lock, with sluice-gates, will furnish ample means, and unless some such provisions be made the drainage of this district will be very defective, and ultimately call for artificial works much more expensive and not more efficient than would be the use of the canal as a flushing reservoir. In the slips of New York, which are, to appearance, open to the action of every tide, they have been compelled, by the insufferable character of the nuisance to the senses alone—without reference to its injury to health—to alter the outlet of their sewers from the slips to the head of the piers in the East river. When you compare the area draining into this creek and the land-locked character of its outlet, with the area drained into one of these slips, comparatively open, and consider the effect produced in the latter case, no argument is necessary in order to show the absolute necessity for some such provision as that we now propose, in order to prevent to a great extent the evils alluded to.

The property-holders propose converting this creek into a canal 100 feet in width and some 6 feet deep at low water. We propose, by placing a tide-gate at a point on this canal to be determined on, to convert it into a reservoir for flushing these intercepting sewers by means of sluices, wherever needed, and without detriment to the navigation of the canal. By making the outlet of these sewers at the East river at the level of low tide, and the upper end 3 feet above, we will at ordinary high tide have a head of 3 feet at the gate at the upper end, which will give sufficient scouring power to cleanse the whole length of sewer. As experience is a more satisfactory guide than the best calculation, we will cite the case of the city of Charleston, South Carolina. The committee of health and drainage report, September, 1857, that they have a line of sewers $2\frac{1}{2}$ miles in length, $4\frac{1}{2}$ feet by $3\frac{1}{2}$ feet—one end inlet the other outlet—the grade being perfectly level from end to end, and the bottom 20 inches above low water; each end is provided with a gate, to be opened or shut at will. Ordinary high tides give a head of 3 feet 8 inches at one end of this sewer, which is sufficient to remove mud, sand, and even brickbats, and the dams made by the workmen, of brick and clay, in building the sewer are washed down and brought to the outlet. The report speaks in the highest terms of the action of these sewers in cleansing the city. The action of this sewer is in accordance with long well-known principles, viz, that the sudden effect of a large mass of water, running with great velocity, is greater than the long-continued effect of the same mass at a small velocity. With a sewer 6 feet in diameter and a head of 3 feet, the current will have a velocity of over 2 feet per second. With reference to the outlet, we have selected a point which, in our judgment, is best suited to the purpose in view. But there may be objections to it. However that may be, the principle advocated of flushing by tide is no way affected by the question of location of outlet, only so far as that this outlet should be beyond the limits of the bay. [See, also, "Charleston, S. C.," part 3, Vol. II, of this report.]

Western division.—This division presents no peculiarities in its drainage, the natural points of discharge being in the deep waters of the East river. In the first, third, and sixth wards in the western division, as also in the thirteenth ward in the northern division—portions of the city where the drainage works are under construction—the quick and direct discharge from numerous outlets into tide-waters, and from areas of limited extent, renders the determination of the dimension of sewers a question of comparative simplicity; but in the more extended areas now under consideration, where the flow of several sewers is concentrated toward a single outlet, the question of their dimensions becomes one of increased importance and of corresponding difficulty. Our remarks on page 10 of report of September 10, 1857, will indicate some of the difficulties with which the question has been complicated—solved in many cases, heretofore, by the simple expedient of making all sewers large enough to be entered by workmen and wheelbarrows. A very simple solution, but one which, as we have seen, entails not only an unnecessary cost in the construction and operation of the sewers, but is detrimental to their efficiency as self-cleansing channels of discharge.

In determining the amount of rainfall sewage to be admitted to the sewers it is stated:

We may fairly assume that 1 inch falling in an hour is an extremely uncommon occurrence; and if, waiving all consideration of the loss before reaching the sewer (to which we have referred as obtaining elsewhere), we proportion the capacity of the latter to a discharge of 1 inch in the hour, a liberal provision is made for storm-water, and largely in excess of that contemplated by the metropolitan drainage commissioners for the proposed drainage works of London.

We wish to show, now, that if the capacity of our sewers is sufficient for such a storm, no further allowance need be made for sewage, as it is insignificant in comparison with the storm discharge.

It has been seen that we may estimate one-half of the flow of sewage, including all waste water, due to twenty-four hours (every thing but the rain), to run off in eight hours from 9 a. m., and that the sewage equals in amount $1\frac{1}{2}$ the water-supply; or for 40,000,000 gallons of water the sewage may be estimated at 50,000,000 gallons, the half of which, running off in eight hours, gives 3,125,000 gallons of sewage per hour during eight hours, which, from 12,000 acres, gives 260 gallons, or 33 cubic feet, per acre per hour, or less than $\frac{1}{100}$ of an inch in depth over the whole area, whilst the capacity of the sewer is calculated for an inch in depth.

The following considerations were advanced with reference to the nature and artificial cleansing of the sewers:

Much misapprehension exists in the public mind in reference to the capacity of pipe-sewers for carrying away the sewage of houses and for keeping themselves clean.

It is not necessary to multiply words upon the first point, as experience has fully demonstrated that the large sewers, or elongated cesspools, could only have been designed from a mistaken view as to the inability of the pipe or smaller sewers to preserve themselves free from deposit. Inadequate water-supply had something to do with it, undoubtedly, in the first instance; but this objection is happily removed here, and it is this abundant water-supply alone which justified us in the adoption of the smaller pipes in lieu of the large brick structures.

The pipe-sewers may not always keep themselves clean by the flow of sewage alone, but in the majority of cases the stoppage will be found to have arisen from a deficiency of water, and they may at intervals, from obvious causes, become choked up; such, for instance, as the washing into them from the streets of large quantities of lime, sand, and even fresh mortar itself, from the sides of new buildings progressing in the neighborhood. Large brick sewers are not exempt from this casualty; but with a proper system of inspection and cleansing, adopted at their first introduction, they can be preserved clean and free of stoppage at a cost less than one-fifth that of the unwholesome method ordinarily pursued of taking out their contents by hand.

A main, calculated to drain the waters from tributaries, may not be self-cleansing until all their currents are brought into aid in the operation; therefore, without some assistance, by flushing or otherwise, mains so circumstanced may be expected to accumulate deposit. But in the event of a complete stoppage, instead of breaking up the street and taking out the pipes, as has been stated was necessary, they can be cleansed by the combined action of the jointed rod, breaking up the deposit, and the flushing-boxes affixed at the manholes, at a much less cost than by the ordinary method. (See *Report of James Newland, engineer to the borough of Liverpool, 1853, p. 39.*) Although this is by no means the method by which we propose to work the system of sewers, yet, as the best calculations—whether founded on theory or practice—are liable at times, from unforeseen causes, to partial failure in their operations, we have this method in reserve for such contingency.

That the ordinary daily discharge of waste water will, in the case of the pipes, preserve themselves from deposit when an enormous brick sewer would become silted up, will be made apparent by a consideration of the circumstances under which a given section of water, adjusted to the dimensions of its channel, will preserve itself free of deposit, whilst the same section of water, with the same fall or inclination, will, in a wider channel, accumulate deposit.

Experience has proved that the smallest pipe house-drain used, viz, 4 inches diameter, where the friction is greater in proportion to the flow of water than in larger pipe, is yet adequate to the prevention of deposit; and without special supplies of water in flushing we may certainly anticipate, then, that the larger main, when due adaptations are made in respect to form, size, material, and inclination, having, in proportion to the run of water, much less friction, will be kept clean by the more concentrated streams of water through them. This has been established by the evidence of actual practice; but the same experience shows the utter indifference of individuals in many cases to their own comfort and health, by allowing substances to enter the house-drains for which they were never designed. No capacity of public sewer will prevent the house-drain closing by the introduction of improper substances. Hence the permit to connect with the sewer should be based upon a proper attention to this important particular by the house-owners.

The true purpose of the sewer is the instant removal from the vicinity of dwellings, of all refuse liable to decomposition, and which is capable of being conveyed by water. The more fully this is accomplished the more perfect will be the system; and to effect this end a natural and constant flushing by the waste water is resorted to for the prevention of deposit, to supersede artificial and occasional flushing for its removal; but the latter method held in reserve for use rather than a resort to the noisome method of hand-cleaning.

In the annual report of the board of commissioners of city works dated February 1, 1879, we find the following, being from the report of the city engineer:

Gowanus canal.—The board of health has declared the Bond Street sewer outlet a nuisance, and has demanded that all the sewage be removed from the waters of the Gowanus canal. The people living near the discharge of this sewer have patiently urged their grievances; the reply they get is that the city can not afford to make any improvement. Can the city afford to let so many of her tax-payers be condemned to breathe so poisoned an atmosphere as that which is to be found near the upper reach of this canal? On the 30th of November last I submitted a report to your honorable board, giving the cost of extending the Bond Street sewer from its present outlet to the Wolcott Street sewer, and presented the necessary plans for carrying all the sewage out of the canal. I respectfully urge consideration of said report.

Third avenue sewer.—This large main discharges upon the flats of Gowanus bay at the foot of Twenty-eighth street. There is no current at this point, and the sewage is washed by the tides upon the flats, creating a nuisance. The outlet should be removed to the foot of Fortieth street, where the water is deep and the current strong. The wooden trunk has been thoroughly repaired and made as tight as possible, but during certain winds the unpleasant odors from the outlet are carried over a large district.

The relief to the sewerage system.—In accordance with the resolution of the common council, Mr. William E. Worthen was appointed to act with me in making a thorough examination of the sewerage system. The report of our labors was submitted to your honorable board on the 23d of December last. I place the same as an appendix to this report, and ask your careful consideration to the recommendations therein embodied. The expenditure would be a large one, but it must be remembered that the benefit would extend over a large area. The nineteenth ward probably suffers as much as any ward in the city from surcharged sewers, and we propose to take from that ward about one-half of the drainage that now passes into the River Street sewer. Many parties interested criticised the method proposed, on the ground that it did not relieve that ward, whereas the first aim of the plan is to relieve that district.

Ventilation of sewers.—The city should, I think, replace the solid manhole covers with perforated ones, and care should be taken to keep them open on the high points of drainage during the winter months. My predecessor succeeded in getting the perforated covers placed upon new work. I recommend that the old sewers be ventilated in the same manner. The objection raised against the use of simple openings in the manhole covers is that deleterious gases escape from them; but it must be borne in mind that gases escaping in the center of the streets become considerably diluted before they can reach the houses. I believe that the greatest safeguard against the evils of sewer-air is dilution, and this is reached by manhole ventilation.

The foregoing relates to the work proposed to be done at the time of the report. The following report of Messrs. Robert Van Buren, chief engineer, and William E. Worthen, consulting engineer, dated December 23, 1878, is of interest in connection therewith:

REPORT.—Your engineer has been aware, for several years, of the importance of improving the sewerage system, and the frequent complaints of householders in certain localities of the city have caused the most careful investigation to be made from time to time.

The flooding of basements and cellars depreciates the value of property and endangers the lives of those occupying the flooded dwellings. The offensiveness caused by sewerage-flooding drives away more desirable tenants, and throws the occupancy into the hands of the poorer and inefficient population. The damage done to property can not be measured by the soiled goods and dampened walls, but must be measured by the prejudice created against the locality. There are cases where people of populous districts suffer patiently for want of proper sewerage and sanitary improvements, and when yet the fear of taxation will lead them to oppose the carrying into effect of any important measure of relief. There are other property-holders who fear the result of any sanitary agitation lest it might depreciate their property and prevent ready sales. Wherever defective sewerage exists property must depreciate in value, and a city should be particularly careful to place her sewerage system beyond a question of doubt as to its efficiency.

Could the future of cities be foreseen from their start, a great deal might be done in fixing the lines and grades so as to facilitate the drainage and sewerage; but actual experience in this city shows that in many localities the grading of streets has been made without regard to its supplementary value for storm-drainage. We find an unfortunate basin formed by Putnam avenue and Nostrand avenue, another at North Second street and Ninth street, and many similar pockets can be enumerated where there is no possible means of using the gutters to carry off the excessive storm-waters, because the grading of the streets concentrates the flow from all directions to one intersection. We find streets a mile or more from the water-front graded about 8 feet above high-water level, and entire districts but a little over 10 feet above high tide. The importance of grading the streets urges us to suggest that a commission be appointed at once to properly regulate such districts as are not yet improved and built over.

We are convinced that many of the main sewers have become too small since the districts have been built over, and are in many instances fixed at too low a grade. The lower portions of many districts are frequently inundated, and we propose, as far as possible, a system of interception of the sewage and storm-waters of the upper portion of such districts, leaving the lower sewers ample in size to deal with the volume of flow which will then be locally due to them. In his report to the commissioners of sewerage, in 1859, the engineer states that "no system of sewerage yet proposed in any city contemplated the removal of excessive storm-waters by the means of sewers alone; such storms, for instance, as the discharge for short intervals of 2 or 3 inches of rain in the hour. They occur at long intervals and are of limited areas, whilst the construction of sewers to meet the contingency would be attended with enormous expense over the whole city". Again: "In closely-built districts the rainfall will pass off with comparative rapidity, whilst, on the contrary, in thinly-populated districts the rain will be more or less absorbed by the soil; some portion is rapidly evaporated by the heat of the atmosphere and the covered surface of streets and houses. Another portion is absorbed in the surface mud and dirt of streets, squares, gardens, and yards; a portion is retained in cisterns or held in holes and other casual receptacles in paving, whilst a portion penetrates the soil and does not reach the sewer at all, and some passes off directly from the service into the sewer."

The present sewerage plan is calculated for a rainfall of one inch per hour, to be discharged in two hours, or a discharge of one-half a cubic foot per second per acre of area drained.

With these views the sewers of Brooklyn were laid out and constructed, and for many years there were no complaints; but with the building up of the city, roofs and back yards of houses have been connected with the house-sewer; paved streets, with frequent catch-basins, have been added to the drainage area, and have modified materially the element of time in which the rainfall is discharged into the sewer. And in many localities, from mistaken economy in grading, and consultation of the wishes of proprietors of large real estates, rather than the necessities of provision for escape of excess of storms by street-gutters, grades have been established which make pockets or basins, and all the rainfall not absorbed or evaporated must be discharged through the sewers. Owing to these errors, storm-sewers have become necessary, and have been recommended by the engineer of the board of city works for the last five years. Partial measures have been adopted with the relief of certain localities, but the necessity of more radical relief had been felt by the board, and the question has therefore been submitted to us for examination and report.

It has been our aim, with few constructions, to relieve as many districts as possible, and to make arrangements for these districts sufficient for them when entirely built over. We are satisfied that when this condition obtains that the allowance of a discharge of one-half an inch rainfall per hour will not be sufficient for many times in each year; and we have therefore investigated the quantity of rainfall, as far as data could be obtained, and as near the city as possible. In 1859, the best record available was that of Dr. James M. Minor, of this city, who had recorded the rainfall in periods of four hours for eight years, and the rule adopted for the sizes of sewers then was based on this data [*sic*] and the formula of London practices. Neither the rainfall for four hours nor English experience (at that time the only data attainable) would now be considered satisfactory for our localities. The rain-gauge invented by Dr. Draper, and in use at the meteorological department at Central park, gives a positive record of the rainfall for any period of time. It consists of a vessel to receive rain, and so proportioned that one-half inch of rainfall per square foot shall just fill it. As the vessel fills it descends, and in its descent it makes a downward mark on a sheet of paper, which is moved forward by clock-work, and when the vessel is filled it empties instantly and rises to its former position and begins again its mark downward. Each mark from the top to the bottom of the graduated paper denotes one-half inch of rainfall. By the kindness of Dr. Draper we have been permitted access to the records, and have copies made of the large rainfalls, which are herewith appended, and will be readily understood. Commenting on these records, beginning with the first, August 12, 1875, the rain commenced at 2 p. m.; at about 4 p. m. a half-inch had fallen, of which a quarter of an inch had fallen in the preceding half-hour. By this time the streets and the gutters had been well filled, the sand saturated, roofs and flagging cooled, and there was undoubtedly a very perceptible increase of flow into the sewer. In the next hour there was an inch rainfall, of which there was little if any loss by absorption, but some by evaporation. Nearly all the inch must have been discharged by the sewer, if there was no escape by street grade. In the record of August 18, 1875, the rain commenced at a little before 11 a. m. At 11.30 a. m. one-tenth of an inch had fallen, and within the next 40 minutes 1.2 inches fell. On August 18, 1876, the rain commenced at 6.30 a. m.; at 9.40 a. m. one inch had fallen, and in the next 40 minutes another inch. On July 18, 1877, the rain commenced at 1 p. m.; at 2.10 p. m. one-half inch had fallen; within the next hour one inch, and the next 0.85 inch more. On October 5, 1877, the rain commenced at 4 p. m.; at 7 p. m. one-half inch had fallen; at 8 p. m. 0.85 inch more; at 9 p. m. 1.65 inches more. On June 22 and August 1, one inch fell within the hour, but without previous rainfall. On September 5, 1878, one inch fell between 2 and 3 a. m., and another inch in the next 50 minutes. From these records it is evident that if the whole rainfall is to be discharged through the sewer a provision for the discharge of one inch would not be sufficient, but might be ample if care should be taken in the grading of the streets, so that these excessive rainfalls might be in part avoided by the gutters. In portions of the city this is done, but in others basins have been made by grading to low points from all directions, as at Putnam avenue and Nostrand avenue, at North Second street and Ninth street, and other places, and the only relief is through the sewers. Of these excessive rains spoken of by the engineers of sewers in 1859, that of August 6, 1878, is an example. It will be seen that it commenced suddenly at about 7.35 a. m., and by 8 a. m. 2.6 inches had fallen in the short space of twenty-five minutes. Although this excessive rainfall did not extend over a large area—as but 1.13 inches is recorded for the day at the United States signal service, Equitable Assurance building, 120 Broadway—yet it affords another strong argument for the necessity of so grading a city that such an excess may pass off in a measure harmless by the street-gutters, which it could not possibly do in built-up districts if the whole were to be discharged through the sewers.

It has been already stated that the dimensions of the sewers of the city were established from a formula determined by London experience. At that time (1859) there was little else on which to base the calculations; the records of rainfall were almost always that of twenty-four hours—data sufficient to determine quantities available for water supplies, but useless to determine the discharge of sewers when the rainfall is to be got rid of within a brief period of time. It was supposed that but half of the rainfall would reach the sewer within the time of its fall, a large part being diverted by evaporation and absorption, the latter cause being aided by cisterns and cesspools. Cisterns have long since been discarded, and it is now almost a universal practice (indorsed by the board of health) to connect the back yards and areas directly with the house-sewers without cesspools. Leaders to roofs are also connected, and thus obtains a condition not contemplated by London practice or by first authorities. In addition, the rains of London are more continuous and drizzling,

not so many sudden, heavy showers as here; yet, with the extension of their system, we understand that there has been the same trouble experienced as in our city; the sewers there have been surcharged and the cellars flooded. In this view, and with the knowledge obtained from rain records, we have thought best to discard entirely English formula and try something applicable to our situation and locality. For this purpose we have obtained the record of some careful experiments on the flow of the new Boston aqueduct, the flow of the Croton aqueduct, and have made experiments on that of our own; and, although in all of these conduits the velocity of flow is much less than will obtain in our proposed large sewer when discharging at its full capacity, still, on all, the dimensions are so much nearer to those of the sewer proposed that we have given the experiments more weight than the results of the London formula, especially as they are partially corroborated by continental practice.

In our report we propose but two main sewers, to relieve not only the flooded districts but also in general to take the sewage. The largest sewer proposed has been laid to relieve, by a single main, as many districts as possible, and with prospective views of farther extension as the necessities of population may require. It is to commence at the corner of Marcy avenue and Greene avenue; thence running westerly through Greene avenue to Flatbush avenue, through Fourth avenue to Dean street; thence down Dean and Amity streets to the East river. The estimate has been made on a sewer 12 feet in diameter, with a uniform grade of 1 in 700. From the line of Henry street the sewer commences to be reduced in height and extended in width till three branches are formed of a little more total area in section than of the 12-foot sewer. This is to discharge at the bulkhead at about the level of high tide, and the object of this branching is to secure a suitable sectional area without materially altering the grade of the street near the outlet. In order that there should be no offense from the sewage proper, we propose to carry the sewage by a distinct branch or sewer, leaving the main sewer at its bottom near Henry street, and following the line of the central branch, and directly beneath it, forming a part of its masonry to the bulkhead, and extend thence by a cast-iron pipe through the center of the slip or along the pier, supported by piles, out into deep water; the level of the bottom of the main sewer at Henry street to be 4 feet above high tide, and the diameter of the sewage branch to be 36 inches; the velocity of flow will therefore be sufficient to prevent deposit and afford a good scour. By this arrangement there will be no offensive deposit within the slip, and the storm-waters from the main will, in a measure, remove any deposit in it. By the inspection of the "plan exhibiting the system of sewerage in the city of Brooklyn", accompanying this report, on which the lines of our proposed sewers have been sketched, it will be perceived this large sewer will relieve a large portion of map L, and the drainage of considerable portions of map K, E, F, and J will also be diverted. In all of these districts, notably in L, there has been considerable damage and frequent complaints from the overflow and incapacity of the present sewers during heavy storms.

It is proposed that the line of sewers should be extended through Greene avenue to Broadway and into map O, which, when built over, will need larger sewer relief than that provided by the present system. Branch storm-sewers will soon be required to be extended from the proposed sewer up Nostrand avenue into the higher portions of map L. These will be comparatively inexpensive, as they will not require to be very far below the surface of the street. By the diversions of drainage of so large a portion of map L into the proposed sewer, the flow through the Kent Avenue and River Street mains will be very much reduced, but it will be impracticable, by any system of sewerage, to relieve Flushing avenue entirely of occasional floodings. We would suggest, therefore, that the grade of this avenue be raised, and that the earth excavated from the proposed sewer be applied to this purpose. For quite a long length of sewer it will afford the readiest means for the disposal of the earth, with but little if any expense to the city in grading, while the enhanced value and superior sanitary condition of the locality will amply compensate some expense on the part of the abutters.

The other sewer now proposed is for the relief of map I, which has long suffered from overflowing sewers, due in a great measure to errors in street grades; this sewer to commence at Union avenue, thence through Hope street to Seventh street, through Seventh street to North Fourth street, and through North Fourth street to the river, the sewer to be of a uniform diameter of 5 feet 6 inches, and with a grade of 1 in 1,000. The sewer is to be of larger size, in proportion to the area to be drained, than those of the present system, on account of our views on the quantity of rainfall that may have to be provided for in this locality.

It is questionable whether even a larger size might not be in the end more economical, looking to its extension into the large district of map O, as an intercepting sewer for the drainage of the high grounds easterly of Broadway. In view of the large outlay to be incurred, we have preferred that the estimate be only for a 5 feet 6 inches sewer.

Estimate cost.—Our estimate for the total cost of the North Fourth Street sewer, which is 4,400 feet long and 5 feet 6 inches in diameter, is, in round numbers, \$50,000.

For the Greene Avenue and Amity Street sewer, which is to be 12 feet in diameter and 16,000 feet long, and of which 7,000 feet is in open cutting and 9,000 feet in tunnel, including a branch sewer in Nostrand avenue as far as Halsey street, is \$696,000, or, in round numbers, \$700,000.

These estimates include the total cost for all expenses, diversions of the water of the present sewers during construction, connection with them after, shafts and manholes, removing earth from streets, etc. The earth from this excavation of the large sewer has been estimated on a haul of $1\frac{1}{2}$ miles, without any value thereafter for the filling of vacant lots or the grading of streets. For per foot run the tunnel will cost more than that of open cut; but by it the length of line is reduced and the annoyance of opening streets avoided.

It has been our aim by simple schemes to cover as large a ground as possible, to reach as many flooded districts and surcharged sewers as we could. Our investigations have shown that it would be unwise economy to attempt relief by merely tapping the main sewers with overflow sewers near their outlets. We have endeavored to fix upon "a plan for permanent relief, and one that would meet the requirements of the city as the sewerage increased and the districts became built over".

CEMETERIES.

The principal cemeteries used by the citizens of Brooklyn for the interment of their dead are as follows:

Greenwood Cemetery, incorporated April 18, 1838, area 450 acres, is situated partly in the city and partly in the adjoining town of Flatbush, on what are known as Gowanus heights, which overlook the bay of the same name. The total number of interments to the end of 1880 is 209,000, and the average number annually is about 6,000. Graves are required to be not less than 6 nor more than 10 feet in depth. The cemetery is beautifully laid out, and is considered one of the handsomest in the country. There are 17 miles of paths and over 20 miles of stone-bedded avenues intersecting the grounds in all directions. There are 8 lakes of varying dimensions, in 4 of which there are fountains, and over 16 miles of sewer-pipes for drainage purposes. Lots are sold for burial purposes only, and are not transferable. There have been about 24,000 lots sold so far, ranging in price from \$125 to \$1,000, according to size and location. During 1880 the receipts at this cemetery amounted to \$203,000, and the expenses to \$160,000. The general "fund for the improvement and permanent care of the cemetery" is \$650,000, which

includes \$74,000 deposited by lot-owners in the hands of the trustees, the interest of which is annually spent in caring for and improving private lots. In regard to lot improvements, boundary posts are required to be 3 feet under ground and 2 feet above ground. In new lots only one bar is permitted between the posts.

Cypress Hills Cemetery is situated a little over $1\frac{1}{2}$ mile from the eastern boundary of the city, and contains about 400 acres. The cemetery was organized in 1848, and the total number of interments to the present time is 115,276. It is made up of hills and dales; many considerable lakes and small bodies of water are interspersed, and there is a great deal of forest and shrubbery. The grounds are intersected by paths and avenues that run in curved lines. The annual income of the cemetery is about \$26,000, and all this is expended in care and maintenance. Lots vary in price from \$5 to \$300, and single interments may be obtained for from \$3 to \$20. Graves are required to be 6 feet in depth.

Evergreen Cemetery, area 275 acres, is situated in East New York, about 3 miles outside the eastern limits of Brooklyn. It was opened for burial purposes as early as 1851, the company having been organized in 1847. There have been 75,727 interments made here, and at present the average number of burials annually is 5,000. Graves are required to be 6 feet deep. For a full lot, 20 by 20 feet, the charge ranges from \$200 to \$800, with proportionate reduction for half or quarter lots. Single graves are from \$8 50 to \$15. The cemetery is handsomely laid out, and is traversed in all directions by macadamized roads and cement walks. Much attention has also been given to landscape-gardening, the planting of flowers, etc.

Mount Olivet Cemetery, area 60 acres, is situated in the town of Maspeth, Long Island, adjoining the city. The total number of interments made in this cemetery since its opening in 1850 has been 3,020, and the number now made annually ranges from 180 to 200. Lots are 18 by 22 feet, with a border of 2 feet between lots, and vary in prices from \$150 to \$250. Single graves are \$12 for adults and \$8 50 for children. The depth of graves is 6 feet. The annual cost of maintenance is about \$4,000.

Though all the above cemeteries are used by the people of Brooklyn, the bulk of the interments are made from New York city.

MARKETS.

There are no public or corporation markets in Brooklyn.

SANITARY AUTHORITY—BOARD OF HEALTH.

The health of the city is in charge of the board of health. This body consists of three members, one of whom is a physician. The president of the board is appointed by the mayor, with the consent of the board of aldermen. The other members are *ex officio* the president of the board of police and excise and the president of the board of aldermen. The board meets weekly, or oftener if necessary. Its ordinary average expenses are about \$45,000, incurred in measures for the preservation of the public health and in the collection and registration of vital statistics. In its expenditures the board is in all cases limited to its appropriation. Its power is large, including the right to do all acts necessary for the preservation of the public health. The chief executive officer of the board is the president; his salary is \$4,000 per annum, and his duties are to enforce the orders of the board. There are employed, besides an indefinite number of sanitary police, 13 assistant health officers and inspectors, of whom 10 are physicians. They all have police powers to the extent of enforcing the laws and regulations of the health department. Inspections are made whenever nuisances are reported and whenever or wherever the board may have reason to believe there exists any thing detrimental to the public health. When a nuisance is reported the procedure is: 1st, inspection; if found to exist, 2d, service of a notice upon the owner to abate; 3d, re-inspection, if not abated; 4th, prosecution in court for misdemeanor. If there is thus a great delay and the nuisance is a serious one, the board abates it itself. These nuisances may relate to defective house-drainage, privy-vaults, cesspools, sources of drinking-water, etc. As to defective sewerage and street-cleaning, the answer is made: "We have neither defective sewerage nor street-cleaning in this city at the present time." The sewers and streets are under the jurisdiction of the board of city works.

The board exercises no control over the conservation and removal of garbage. It forbids the interment or re-interment of the dead, or the establishment of new cemeteries within the city, without permits therefor, to be obtained from the board. It also forbids the dumping or throwing of any offensive matter into the harbors or streams. Excrement must be removed in the day-time, in air-tight vessels, dumped upon air-tight boats without exposure to the air and inoffensively, and so removed. All this is done by virtue of permits and under inspection.

Small-pox and scarlet-fever patients are isolated. The board takes cognizance of the breaking out in schools of contagious diseases, and takes protective measures accordingly. The city has no public pest-house; when it is necessary to remove cases of contagious disease they are taken to a proper hospital, at Flatbush, Long Island. Vaccination, while not compulsory, is performed at the public expense. Cases of contagious disease are registered in a book as certificates thereof are received from physicians, etc., and an index is made for reference. Certificates of births and deaths are numbered as received, bound in volumes of a convenient size, when an index is made of name and number for reference.

The board reports at irregular intervals to the mayor and common council.

The following general information as to the scope, status, and working of the board of health is taken from the report of the board for the year ending May, 1877:

The law of 1875, under which this department is organized, repealed all health laws and sanitary ordinances then in force in this city, and required the board of health to prepare a code of sanitary ordinances such as it should deem proper for the protection of the public health and for the registration of vital statistics, which code, when adopted by the board and approved by the common council, should be the sanitary law for the city of Brooklyn, and should be enforced and carried out by the board of health. Under this provision the present code of sanitary ordinances was prepared and adopted by this board, and approved by the common council August 4, 1875. It is based upon the old city ordinances relating to the public health as they had been amended from time to time by the board of health, with such alterations and improvements as the experience of long-acting sanitary officers suggested. It has fully demonstrated its efficiency in the speedy abatement of nuisances dangerous to the public health, and in the organization and operation of the office for the registration of vital statistics. It is exceedingly broad in its requirements, and a violation of its provisions is made a misdemeanor, punishable by fine or imprisonment, or both. The power of the board to prosecute by a civil suit is abolished. Any violation of the code or of the orders of the board must be pursued by a criminal action, if at all. This change in the method of procedure against delinquents has proved most efficacious in the abatement of nuisances. To reach the end of civil action for violation of the code was a long and tedious process, ending generally in the payment of costs by the defendants, or in a worthless judgment coupled with an unabated nuisance. To procure the enforcement of a sanitary ordinance now requires but a brief time, as the knowledge that a warrant will speedily follow non-compliance, with arrest, fine, and imprisonment to succeed, has terrors for the average citizen which will not allow him to remain long a delinquent. Experience has shown this to be the proper method of procedure in the enforcement of sanitary ordinances, more especially as a board of health is intended to be an instrument for maintaining the public health, and not for adding to the revenue of the city. The board has also power to act as a legislative body upon all matters pertaining to the public health or to the registration of vital statistics; also to enforce obedience to its orders likewise by criminal prosecution; and it may thus take cognizance of any nuisance or matter dangerous to health, the abatement of which may not have been provided for in the sanitary code.

The duties of the board embrace three distinct spheres—the preservation of the public health, the collection and recording of vital statistics, and the management of the ambulance service, the latter placed in its hands by the common council. In each of these the efforts of the board to administer its trust faithfully in the interests of the public have been ably assisted by its staff of employes and agents, who, with but trifling exceptions, have proved themselves most efficient and zealous public officers, performing their difficult, disagreeable, and oftentimes dangerous duties with a fidelity and discretion worthy of the highest praise.

The legislative power of the board of health in relation to nuisances is limited to that class which is detrimental to the public health. The board can of itself make no orders or ordinances, with a sanitary reference, extending farther than this. The code of sanitary ordinances, however, extends to other matters. Having been adopted by the common council, it has the same strength and validity as other ordinances of the city, and when it is enforced by this board a large class of nuisances and other evils are reached and remedied that would be beyond the jurisdiction of the board were its powers limited to the enforcement of its own legislative acts only.

The proper officers of the department are empowered at all times to enforce the sanitary ordinances, and, without a special order of the board against each individual nuisance, to proceed against all persons violating any of their provisions. An order of the board is necessary only when further action, or a different remedy from that prescribed by the ordinances, is required for the abatement of a nuisance. In this manner an imminent danger to the public health may be abated in a few hours, and all the circumlocution and much unnecessary detail of labor are avoided.

Complaints of nuisances are received from three sources: from citizens, from the sanitary inspectors, and from the officers of the police. A form for citizens' complaints is prepared, upon which is required to be entered the name and address of the complainant, the location and a brief description of the nuisance complained of, with the name and address, if known, of the person responsible therefor. This is numbered and recorded, and referred to the sanitary inspector of the district within which the alleged nuisance is located, for an inspection and report. If the inspector finds that there is no cause for complaint, or that no action is required by the department, he indorses the complaint to that effect, and it is placed on file. If he finds any matter or thing requiring action, he reports all the facts in writing, makes a formal complaint against the premises, and suggests such remedy for the abatement of the nuisance as his experience and a personal examination may dictate. These reports and complaints are numbered, recorded, and placed on file, and an order applicable to each made and served upon the owner, agent, or lessee or occupant of the premises complained of, or other person responsible for the nuisance, specifying a proper remedy, and requiring an abatement of the nuisance within a certain number of days, varying according to the character of the offense. Reports of minor nuisances are made by the sanitary police, and are treated in the same manner. When the time specified in the order has expired, the premises are re-inspected by the sanitary inspectors, and a written report made as to the action taken thereon. If, as is the case in the majority of instances, the orders have been complied with, the complaint is so indorsed and placed upon file and an entry to that effect placed upon the books opposite the record of the complaint and order, the case being closed. If an inspection shows that an order has not been complied with, and no reasonable excuse is given for a delay in the execution thereof by the party upon whom it is served, the complaint is referred to the counsel of the board, who is instructed to commence forthwith a criminal prosecution against the offender. A warrant is thereupon issued and the delinquent taken into court and turned over to the tender mercies of the judge. Except in extreme cases an adjournment is given for a sufficient time upon the party promising a compliance with the orders of the board. It is seldom that a case is defended, and but rarely that the imposition of a sentence is found necessary.

The board has found its greatest difficulty in enforcing its orders for the abatement of nuisances upon property belonging to non-residents, or which is held by institutions, mortgagees, and receivers, or is otherwise in a transitional condition of ownership. In such cases the board has power to execute its own orders; but as by this means the property of individuals is improved at the expense of the city, it is only in extreme instances that the board feels authorized to take this method of procedure. There should be authority given by law to collect the cost of the work done in such cases from the income of the property on which the nuisance is abated, and to make it a lien upon the property itself, as are taxes or assessments for other purposes.

MUNICIPAL CLEANSING.

Street-cleaning.—The streets are cleaned by the city, the work being done by hand by contract. Most of the streets paved with concrete, or Belgian or granite or wooden blocks, or with cobble-stones where street car-tracks are laid, are cleaned once a week. Many streets are cleaned twice a week, and others once in two weeks. All docks, piers, and bulkheads belonging to the city are cleaned at least once in four weeks. The service is said to be fairly well performed; its annual cost to the city, including the removal of garbage and ashes, is \$70,000. The sweepings are deposited in low lots for filling.

roundsmen and patrolmen the coat is a single-breasted frock, with proper differences only in the wreath and number on cap, and for doormen the coat is a single-breasted sack. The summer dress of the force is made of the best blue flannel weighing not less than 14 ounces to the yard. For the superintendent, inspectors, captains, and sergeants the coat is a double-breasted sack; for roundsmen, patrolmen, and doormen the coat is a single-breasted sack. The superintendent, inspectors, captains, sergeants, and roundsmen provide themselves with blue flannel or white duck vests, made single-breasted, to be worn while on duty in station-houses and police headquarters, where the coat may be worn unbuttoned. The overcoat is of navy-blue beaver cloth, double-breasted, and with rolling collar. For all members of the force when in full uniform or summer dress the gloves worn are of white cotton; winter gloves, when the overcoat is worn, are of buff leather. The men furnish their own uniforms, purchasing the numbers and buttons therefor at police headquarters. They wear caps in winter and colored straw hats in summer. Patrolmen are equipped with clubs only. That worn in the day-time is 22 inches long, and is carried in a pocket in the trousers; the night club is 28 inches long, and is carried in the socket of the belt. Their hours of service are as follows: 1st turn, 6 to 8 a. m.; 2d, 8 a. m. to 12 m.; 3d, 12 m. to 6 p. m.; 4th, 6 p. m. to 12 midnight; 5th, 12 midnight to 6 a. m.; each man taking an alternate turn and thus serving fourteen hours one day and ten the next.

During 1880 the arrests made numbered 26,785. The principal causes therefor were: Drunkenness, 10,207; assault and battery, 4,456; vagrancy, 1,510; petit larceny, 1,298; drunkenness and disturbing the peace, 1,001; violation of city ordinances, 994; lounging, 664; malicious mischief, 540; breach of the peace, 375; fighting, 373; felonious assault, 356.

During the year property to the value of \$51,543 03 was reported to the police as lost or stolen; of this, \$37,444 44 was recovered and returned to the owners. For the same period the station-house lodgers numbered 23,206; for 1879 their number was 27,366. No free meals are furnished to these lodgers.

The police force is required to co-operate with the fire department in preserving order at fires; with the health department in enforcing sanitary ordinances, and with the building department in reporting all unsafe buildings.

Special policemen to the number of 200 may be appointed by the commissioner at the request of corporations or of individuals. These receive no pay from the city unless called upon in case of riot, when they receive the same pay as the regular force. Such policemen may be removed at any time without assigning any cause therefor, upon notice to those upon whose application they were appointed.

During 1880 there were from all causes 626 cases of sick and disabled among the force. The salaries of the force for 1880 were \$676,049 10; the total cost of the department was \$757,931 29.

The following general information as to the force is from the report for 1880 of the commissioner of police and excise, James Jourdan, esq., to the mayor and common council:

It is not my intention to importune you to exercise your official authority in regard to the appointment of any considerable number of additional patrolmen, but simply to call your attention to the fact that the population of the city of Brooklyn has increased to nearly double since the act was passed by the legislature of the state of New York, in 1870, authorizing the appointment of 500 patrolmen.

I believe it incumbent upon me, as the sole head of the department, and possessing a familiarity on the subject that experience only can give, to state that the most extraordinary service that can be exacted from the number of patrolmen at present doing service, and as provided by the board of estimate and the common council, is entirely inadequate for the proper protection of the lives and property of our citizens.

It should be borne in mind that the city of Brooklyn is in such close proximity to New York, and the conveniences existing for rapid transit between the two cities, the doors of Brooklyn are opened for the reception of the worst characters and those who have escaped from justice on the other side of the river.

Brooklyn, according to the last census, has a population of 566,000, and a police force of 599, exclusive of the superintendent, inspector, drill-captain, and 31 doormen, consisting of captains, sergeants, roundsmen, detectives, and patrolmen. Of this number, 474 are patrolmen. This entire force gives 1 officer only to every 945 of the entire population.

It is shown above that 474 men only are actually employed in the capacity of patrolmen, 26 less than the number authorized by law. Of these, 66 are detailed for special duty at the various offices of the municipal departments, and the courts of the city and county, thus leaving only 403 patrolmen for actual patrol duty. In some instances detailed patrolmen are performing clerical duties, being thus assigned by the head of the department to which they are detailed.

It is utterly impossible for the police to properly protect the large interests along the water-front without the aid of an organized water-patrol. There is about 8½ miles of water-front within the western boundary of the city, which is occupied by piers, slips, warehouses, boat- and ship-yards, ferries, etc., some of which are entirely isolated from the streets, and can not be looked after by the regular foot-patrol effectively. I would also urgently request that authority be granted to appoint an additional number of mounted officers, say about 5, making a total of 15. This branch of the department renders valuable service, and should be encouraged by increasing its number. There are at present only 10 mounted patrolmen and 1 sergeant, an exceedingly small number to prevent the fast and sometimes reckless driving which frequently occurs on many of the thoroughfares of our city, and to protect the people from the dangers resulting therefrom.

I desire to call your attention to an evident defect in the laws enacted for the government of our police force.

In order to encourage laudable ambition and increase the efficiency of the force, power should be vested in the head of the department, or some other local authority, to reduce officers from a higher to a lower grade, according to their capacity to perform the duties required of them. A captain may not possess all the requisite qualifications for the duties devolving upon him in that grade of office, and yet be qualified to perform the duties of a sergeant or roundsman. The same rule applies in all other grades of office in the department, but under existing laws there are no means by which the department can be relieved of an inefficient officer other than by dismissing him from the force for incompetency in the office at present held by him, thus depriving the department of his experience, which might be utilized in a lower grade, and which would give him the means of continuing to earn a living for himself, and his family should he have one. The enactment of laws procured for the special benefit of certain grades of city employes, who organize for that purpose frequently, have a very baneful effect, as, for instance, the laws relating to detectives and their salaries. Before the law of 1877 was enacted, grading

detectives and fixing their salaries, patrolmen were selected as detectives by the board of police, who doubtless were under the impression at the time of their being thus detailed that they were qualified for an important grade of office, and, as they seem to be secure in the position of detective by the provisions referred to, appear to have no further incentive to a zealous performance of duty, and the commissioner is unable to remove them or avail himself of the services of men more suitable for that office, unless they be convicted of an offense which would warrant their dismissal. This, of course, is not the case in regard to the detective force in its entirety, as there are many able and efficient detectives who can always be relied upon for a faithful and intelligent performance of their duties. The power to reduce inefficient detectives to the grade of patrolmen should be vested in the head of the department.

I would say that, notwithstanding the fact that about fourteen years ago the metropolitan police commissioners recommended the appointment of 1,000 men, to be assigned to duty in the city of Brooklyn, I am satisfied that if the power of reducing inefficient superiors to such inferior grades as they may be qualified to fill, including detectives, and the return of all officers at present detailed to other departments to patrol duty, the city can be efficiently patrolled during the present year without any further increase.

I believe that, should this power be conferred upon the head of this department, it would tend to increase the zeal and efficiency of the force because of the knowledge of this power being thus vested, and would render the necessity of its exercise of infrequent occurrence.

Unless the members of the force who are at present detailed, as hereinbefore mentioned, are returned to the performance of patrol duty, I shall be compelled to avail myself of the provisions of law which authorize the commissioner to appoint 500 patrolmen.

I deem it my duty to call your attention to the police pension law enacted by the legislature of 1877. Under the provisions of this extraordinary law, able-bodied men who may have been on the police force, including service in the late metropolitan department, for a period of twenty years, may, at their own option, retire from active service on a pension of an amount equal to one-half the salary received by them at the time of their retirement. Some of those who have retired themselves are in lucrative and active employment at the present time, notwithstanding the fact that they are in the prime of life, and are physically fit for the performance of any duty on the police force for which they may be mentally qualified, and in some instances as much so as they have been at any time during their connection with the police force. While I earnestly recommend the repeal of this law, I would most heartily recommend the passage of a pension bill which would liberally provide for all old and faithful officers who may become physically or mentally incapacitated for the performance of further police duty, and for all those who may be permanently injured in their capacity as policemen, and for the widows and orphans of those who sacrifice their lives in the performance of their duties, or who die from natural causes while members of the force. If officers continue to take advantage of the law referred to, it will ultimately entail an enormous expense on the tax-payers of our city.

Attention is again called to the necessity of procuring quarters other than those occupied at present by the officers of the first precinct. The police surgeons make the following report in relation to its condition: "The ceilings in the men's sleeping-rooms are low and very badly ventilated. The small space afforded for the large number of men for sleeping accommodations is entirely inadequate, 21 men being obliged to sleep in one room. The water-closets, urinals, and lodgers' rooms are situated immediately under one of these sleeping-rooms. Several members of the force who are obliged to sleep in this station-house suffer from vertigo caused by the foul air in their quarters while asleep."

This department is continually receiving complaints from citizens of incumbrances on the streets and sidewalks in violation of the city ordinances; and, when the police undertake to see that the ordinances are enforced, the parties in violation produce permits from the alderman of the ward in which they live, thereby preventing the police from causing the incumbrances to be removed.

I would most earnestly request that you take some steps looking to the removal of all obstacles tending to prevent the police from the enforcement of these ordinances. There are a large number of thoroughfares in which these incumbrances are exceedingly dangerous, especially on streets where railroad-tracks are laid, in which vehicles are allowed to remain between the tracks and sidewalks, and which interfere with people alighting from the cars, as is done sometimes while they are in motion, and frequently on dark nights passengers can not see the incumbrances until they are in the act of getting off the car, and then are unable to check themselves until they come in collision with the vehicle, or whatever the obstacle may be.

The occupants of 1,606 houses notified the captains of the precincts in which their residences are located that they intended to leave the city during the summer months of the past year, thereby enabling the police to give the houses special attention during their non-occupancy. Eight only of these houses were robbed; the property of 6 of the 8 was recovered and restored to the owners. The value of the property stolen from the remaining 2 was merely nominal. Three arrests were made, the prisoners tried, and penalties inflicted commensurate with the crimes.

It is of very great importance to the people of our city to thus notify the police department, as the result shown above indicates, in order that the property contained in the houses vacated may be especially protected from the numerous thieves who prowl around the streets in warm weather.

All patrolmen appointed prior to 1877 receive \$1,000 per annum, and all new appointees, since the passage of the present law relating to the salaries of certain officials of this city, receive \$750 per annum, in consequence of which all new appointments of members in place of old ones who have been or may be removed for any cause, will result in an immediate and present saving of \$250 each per annum. I therefore consider that there is a premium on the enforcement of strict discipline, and I insist that every member of the force and employé of the department shall perform his duty faithfully, or otherwise make way for a better and less expensive officer.

The following miscellaneous items are gleaned from the report of the superintendent for 1880 to the commissioner: There are 633 officers, or 1 to each 895 of the population.

Mutations in the force during the year: 39 were appointed, 6 resigned, 19 were dismissed, 12 retired, 3 were promoted, and 4 died; 26,785 arrests were made—1 arrest to every 21 of population. Of the number arrested, 20,540 were males and 6,245 females, being an average of 43 arrests per officer.

Compared with arrests in 1879, there is an increase of 738 males and 341 females.

There were 22,633 arrests for offenses committed against the person, an increase of 2,138 over 1879, and 4,152 offenses against property, 1,059 less than in 1879.

There is seen a favorable decrease in the number of persons arrested who belong to the artisan or trade class.

In the ages of persons arrested the decrease occurs in the ages between 8 and 14. The largest increase is in the ages ranging from 21 to 30 years, and appears on the side of the females.

There is a decrease in the number of persons of color arrested.

An increase of 211 married females arrested, and a decrease of 187 married males arrested, is observed as compared with 1879.

The single males arrested show an increase of 916, and single females of 130.

A small increase is shown in the number that could both read and write, and also in the number that could neither read nor write.

Of persons arrested, 12,335 were born in the United States, an increase of 873 over 1879, and 14,450 were born in foreign countries, 206 in excess of last year.

Of the number arrested born in this country, only 1,656 were females, against 4,589 females of foreign birth.

In the disposition of arrests, 10,573 were fined or sentenced; the sentences of 8,769 were suspended, 5,921 were discharged by court, 808 by officers in command at the station-houses, etc., 618 cases are still pending, and 96 persons were delivered to authorities of other places.

The highest number of arrests were made in July and on Saturdays, and the lowest in February and on Sundays.

The highest number of arrests were made between the hours of 6 p. m. and 12 p. m., and the lowest number during the tour between midnight and 6 o'clock a. m.

Below is shown the nature and disposition of arrests made by the police for which indictments were found by the grand jury, with the following comparisons by years:

	1879.	1880.
Sentenced	178	195
Discharged by court	107	125
Sentence suspended	15	15
Cases still pending	84	164
Total	<u>384</u>	<u>499</u>

The following shows the hours of the day in which robberies occurred, viz:

Between 6 p. m. and midnight	448
Between 12 m. and 6 p. m.	434
Between midnight and 6 a. m.	385
Between 6 a. m. and 12 m.	269
Total	<u>1,536</u>

Of lost children there were 1,058 males and 660 females; these were all restored to their parents or guardians except 10 delivered to asylums. Four of these children were found abandoned in the streets and 6 had run away from the institutions to which they were returned.

The number of street-lamps reported unlighted during the year was 19,535, being 2,916 less than in 1879.

From October 1 to December 31 there were 68,878 daily reports made to the department of city works.

Number of permits granted during the year for parades, as provided by act of May 7, 1872: 443 permits were granted for an average of 61,600 persons.

The number of day-posts is 101, and the number of night-posts is 199.

The average length of each day-post is $5\frac{1}{2}$ miles, and of night-posts $2\frac{3}{4}$ miles.

Report of the number of photographs taken for the rogues' gallery according to offenses, classified, shows that the collection contains 2,706 pictures.

There were 431 prisoners discharged from the Kings County penitentiary during the year, whose names, descriptions, etc., were placed on the records of the department.

There were 917 visits made to pawn-shops during the year by the 9 members of the detective squad.

Miscellaneous: 691 doors were found open and secured, 1,606 vacant houses guarded, 1,378 buildings reported dangerous, 10,232 persons reported for keeping dogs without having the license required by ordinance, 536 fires attended, 214 suspicious persons reported, and property amounting in value to \$42,233 51 taken from prisoners and restored to them when released from cells.

MANUFACTURES.

The following is a summary of the statistics of the manufactures of Brooklyn for 1880, being taken from tables prepared for the Tenth Census by James H. Frothingham, chief 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	5,201	\$61,646,749	37,106	7,020	3,462	\$22,487,457	\$120,085,091	\$177,223,142
Artificial feathers and flowers (see also Millinery and lace goods)	9	11,550	2	106	5	16,170	16,321	46,240
Awnings and tents	12	7,200	15	7	.....	9,319	14,550	35,843
Bags, paper	3	2,200	.....	5	.....	1,420	8,300	12,765
Baskets, rattan and willow ware	12	10,025	24	3	12	11,033	14,206	25,238
Blacksmithing	222	194,573	371	.....	4	232,262	190,655	622,780

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.			
Bookbinding and blank-book making	4	\$4,500	10	3		\$7,008	\$3,030	\$17,691
Boots and shoes, including custom work and repairing	546	311,835	944	216	34	502,834	852,168	1,819,093
Boxes, cigar	3	28,000	49	6	2	27,083	42,100	77,700
Boxes, fancy and paper	12	49,050	50	88	8	45,089	79,066	158,826
Boxes, wooden packing	7	998,500	540		62	243,812	1,280,030	1,767,640
Brass castings	18	151,350	117		4	59,540	244,747	304,875
Brass ware	7	38,800	62	25	15	33,122	57,843	112,750
Bread and other bakery products	532	1,020,375	1,017	7	16	590,660	3,695,720	5,594,975
Brick and tile	6	113,000	134		1	72,774	69,326	201,084
Brooms and brushes	33	69,375	134	47	29	59,872	96,074	207,792
Buttons	5	33,000	23	120	15	30,537	10,363	54,813
Carpentering	300	1,229,878	1,896		2	1,325,540	2,967,855	5,124,407
Carpets, rag	13	2,850	14	2		4,543	11,333	21,741
Carriages and wagons	90	484,350	484		8	289,155	328,425	829,492
Cars, railroad, street, and repairs	7	61,774	92			65,329	59,266	137,055
Cleansing and polishing preparations	6	112,000	44	1	4	24,935	36,919	114,750
Clothing, men's	328	952,445	973	274	13	686,311	1,571,974	2,937,262
Clothing, women's	25	157,425	44	561	10	189,480	300,223	711,249
Coffee and spices, roasted and ground	5	70,000	42		1	28,998	183,342	280,874
Coffins, burial cases, and undertakers' goods	3	47,000	41			22,362	24,563	63,269
Confectionery	104	236,275	165	22	4	79,477	501,766	822,843
Cooperage	42	913,700	1,111	5	242	595,010	1,583,087	2,512,741
Coppersmithing (see also Tinware, copperware, and sheet-iron ware)	10	18,900	27			11,365	24,455	47,029
Cordage and twine	12	2,566,700	665	503	361	860,223	3,200,310	3,915,566
Cork cutting	8	102,800	50	31	16	31,220	100,443	161,853
Cutlery and edge tools (see also Hardware)	5	2,600	6			3,626	1,705	10,450
Dentistry, mechanical	37	59,200	39		2	17,741	28,521	137,271
Drugs and chemicals (see also Patent medicines and compounds)	98	3,449,650	808	129	24	473,353	3,446,549	4,900,338
Dyeing and cleaning	20	23,250	40	8		22,349	178,067	236,007
Electroplating	6	10,650	11	4	15	9,371	3,630	21,632
Fancy articles	14	81,400	63	3	14	34,827	27,535	90,739
Fertilizers	3	545,000	84	5		51,000	1,063,867	1,252,750
Files	12	25,750	58	3	16	29,192	21,978	68,509
Flouring- and grist-mill products	9	662,500	139	5		98,655	2,615,270	2,806,503
Food preparations	9	155,250	93	12	4	33,853	192,882	268,823
Foundry and machine-shop products	121	4,079,250	3,750		140	2,283,934	3,146,992	6,084,832
Furniture (see also Mattresses and spring beds; Upholstering)	88	405,680	608	6	18	315,439	430,135	952,472
Furniture, chairs	11	41,110	88		2	50,658	49,195	121,703
Furs, dressed	22	416,265	251	199	23	137,374	565,154	830,804
Glass	12	930,600	1,158	36	660	630,357	469,593	1,318,081
Glass, cut, stained, and ornamented	8	22,150	14		6	9,614	15,698	33,461
Gold and silver leaf and foil	3	4,500	1	5		2,494	28,174	43,178
Grease and tallow	3	51,070	11			6,869	304,740	333,215
Hairwork	22	44,150	17	82	1	23,683	44,043	101,395
Hardware (see also Cutlery and edge tools)	34	482,550	391	28	22	193,186	401,251	750,297
Hats and caps, not including wool hats	32	533,915	905	378	109	626,504	990,218	1,973,145
Ink	3	220,000	23			18,750	124,000	189,410
Instruments, professional and scientific	12	116,200	108	2	10	65,515	35,018	144,611
Iron bolts, nuts, washers, and rivets	12	114,899	91		12	43,456	103,552	185,245
Iron railing, wrought	15	73,147	79		1	53,468	56,748	141,897
Ivory and bone work	8	10,842	54		14	23,940	22,571	61,355
Jute and jute goods	3	390,000	197	282		132,621	415,788	650,560
Kindling wood	28	211,900	235	2	63	116,932	276,907	433,368
Leather, dressed skins	20	691,650	511	21	31	248,932	1,258,407	1,755,144
Lime and cement	7	77,000	49			20,914	45,192	98,603
Liquors, malt	41	3,838,500	1,082			588,594	2,720,792	4,871,772
Lock- and gun-smithing	28	27,100	26		3	10,793	11,867	43,984
Looking-glass and picture frames	17	32,050	39		7	23,866	56,725	106,056
Lumber, planed (see also Sash, doors, and blinds; Wood, turned and carved)	12	676,500	492		38	230,827	1,271,317	1,707,821
Malt	4	262,000	37			24,375	323,915	433,290
Marble and stone work	92	738,300	730		1	521,858	554,084	1,329,234
Masonry, brick and stone	75	123,295	551		1	374,569	594,426	1,070,809
Mats and matting	7	193,650	183	12	70	116,029	203,427	385,340
Mattresses and spring beds (see also Furniture)	7	31,100	24			13,268	67,640	137,670
Millinery and lace goods (see also Artificial feathers and flowers)	13	140,700	33	34	10	48,710	339,634	476,202

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.			
Mineral and soda waters	21	\$107,800	63	.....	5	\$20,475	\$63,106	\$155,177
Mixed textiles (see also Silk and silk goods)	11	338,300	98	122	30	99,480	203,007	423,239
Models and patterns	9	11,250	25	.....	.....	18,530	5,643	37,530
Musical instruments and materials (not specified)	9	13,500	30	1	6	20,543	56,483	102,724
Musical instruments, organs and materials	4	7,700	8	.....	.....	6,130	4,237	18,076
Musical instruments, pianos and materials	11	195,775	115	1	8	68,084	122,810	252,983
Oil, lubricating	3	22,000	7	.....	.....	3,941	31,221	43,645
Oil, resin	3	82,523	23	.....	.....	14,500	189,622	238,471
Painting and paperhanging	271	335,425	938	14	22	553,040	490,527	1,389,719
Paints (see also Varnish)	28	2,602,800	856	80	5	478,376	4,023,500	5,284,201
Paperhangings	3	285,000	230	50	92	175,733	783,759	1,382,862
Paper patterns	4	105,100	13	84	.....	40,538	44,000	512,550
Patent medicines and compounds (see also Drugs and chemicals)	6	550,000	57	59	1	50,411	274,474	730,046
Photographing	35	88,950	64	18	2	37,455	26,685	141,947
Pickles, preserves, and sauces	7	34,400	17	1	.....	5,008	38,830	69,500
Plumbing and gasfitting	216	352,800	668	.....	23	377,195	701,530	1,399,092
Printing and publishing	64	869,284	693	257	72	522,075	452,610	1,549,743
Pumps, not including steam-pumps	6	10,150	17	.....	.....	9,708	8,156	24,190
Roofing and roofing materials	20	82,975	196	.....	3	98,443	160,974	447,259
Rubber and elastic goods	6	298,837	185	60	28	120,885	604,335	922,857
Saddlery and harness	88	105,877	128	42	15	73,437	151,848	300,425
Sash, doors, and blinds (see also Lumber, planed; Wood, turned and carved)	24	368,350	393	.....	40	190,509	398,679	738,722
Sewing machines and attachments	15	10,725	24	10	5	16,780	6,244	34,158
Shipbuilding	58	768,050	957	.....	.....	746,856	1,044,724	1,999,798
Shirts	25	97,300	57	240	7	105,728	260,511	439,060
Silk and silk goods (see also Mixed textiles)	15	559,325	147	453	107	281,135	443,135	853,480
Slaughtering and meat-packing, not including retail butchering	28	1,125,000	260	.....	.....	194,568	7,340,450	8,010,492
Soap and candles	8	338,000	101	4	13	55,642	587,036	799,053
Spectacles and eyeglasses	3	39,300	75	15	20	36,556	5,300	65,000
Sporting goods	11	65,750	77	24	24	45,112	32,487	103,826
Stamped ware (see also Tinware, copperware, and sheet-iron ware)	6	870,000	858	112	40	394,779	936,084	1,556,829
Stationery goods	7	325,800	63	91	28	65,390	226,237	536,097
Stone- and earthen-ware	4	198,600	175	113	10	102,053	56,960	194,284
Sugar and molasses, refined	11	10,946,000	2,054	.....	13	954,929	50,423,868	59,711,168
Surgical appliances	6	10,650	4	2	.....	5,294	7,686	17,968
Tinware, copperware, and sheet-iron ware (see also Coppersmithing; Stamped ware)	119	156,350	268	2	14	150,331	346,887	619,134
Tobacco, chewing, smoking, and snuff (see also Tobacco, cigars and cigarettes)	10	1,059,890	129	466	1	198,770	931,250	2,302,703
Tobacco, cigars and cigarettes (see also Tobacco, chewing, smoking, and snuff)	341	376,590	519	17	56	228,141	381,589	977,480
Toys and games	10	255,775	146	199	43	169,958	142,769	332,146
Trunks and valises	7	89,800	59	18	16	32,138	88,249	146,344
Umbrellas and canes	9	18,600	4	8	.....	4,066	14,305	28,773
Upholstering (see also Furniture)	72	584,535	197	135	35	145,950	433,514	784,112
Varnish (see also Paints)	3	716,800	70	.....	3	47,186	353,205	874,655
Vinegar	7	63,712	16	.....	.....	6,074	54,630	77,019
Watch and clock repairing	109	82,668	133	8	11	76,171	53,319	221,723
Watch cases	4	156,565	261	22	12	249,816	717,177	1,109,046
Window blinds and shades	12	294,450	129	8	3	82,171	224,722	475,805
Wirework	10	240,778	128	23	21	83,690	97,641	228,204
Wood, turned and carved (see also Lumber, planed; Sash, doors, and blinds)	19	95,300	78	.....	6	39,866	52,411	139,255
Wooden ware	3	9,250	20	.....	1	9,477	21,150	36,264
Zinc	3	26,500	14	.....	.....	11,502	10,520	33,385
All other industries (a)	78	5,231,247	3,060	923	438	1,691,160	8,540,026	12,065,141

a Embracing agricultural implements; babbitt metal and solder; baking and yeast powders; belting and hose, leather; billiard tables and materials; bone, ivory, and lamp-black; boot and shoe findings; brass and copper, rolled; carpets, wood; carriages and sleds, children's; clocks; corsets; cotton goods; dyeing and finishing textiles; dyestuffs and extracts; engraving, wood; envelopes; explosives and fireworks; felt goods; gas and lamp fixtures; gloves and mittens; glue; gold and silver, reduced and refined; hat and cap materials; housefurnishing goods; iron and steel; iron forgings; japanning; jewelry; jewelry and instrument cases; lamps and reflectors; lead, bar, pipe, sheet, and shot; leather, tanned; liquors, distilled; lithographing; oil, essential; oil, linseed; oilcloth, floor; oleomargarine; paper; paving materials; pencils, lead; pens, gold; photographic apparatus; plated and britannia ware; pocket-books; printing materials; racking hose; refrigerators; regalia and society banners and emblems; sand and emery paper and cloth; saws; straw goods; taxidermy; upholstering materials; watch and clock materials; whalebone and rattan; wheelbarrows; wire; wood preserving; and wool hats.

SOCIAL STATISTICS OF CITIES.

From the foregoing table it appears that the average capital of all establishments is \$11,852 86; that the average wages of all hands employed is \$472 55 per annum; that the average outlay in wages, in materials, and in interest (at 6 per cent.) on capital employed is \$29,854 13.

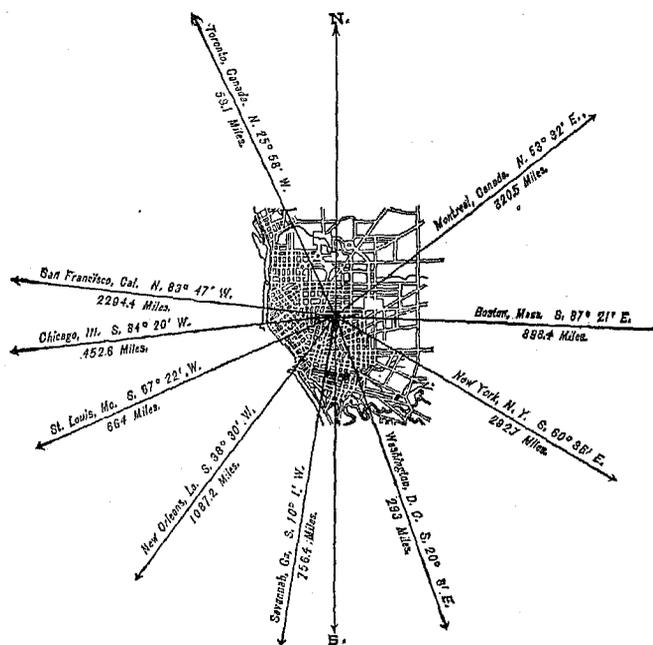
BUFFALO,

ERIE COUNTY, NEW YORK.

POPULATION

IN THE
AGGREGATE,
1830-1880.

Year	Inhab.
1790	.....
1800	.....
1810	.....
1820	.....
1830	8,668
1840	18,213
1850	42,261
1860	81,129
1870	117,714
1880	155,134



POPULATION

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

Male	.....	76,904
Female	.....	78,230
—		
Native	.....	103,866
Foreign-born	.....	51,268
—		
White	.....	154,268
Colored	.....	* 866
* Including 5 Chinese and 4 Indians.		

Latitude : 42° 53' North ; Longitude : 78° 52' (west from Greenwich) ; Altitude : 573 to 633 feet.

FINANCIAL CONDITION :

Total Valuation : \$83,910,583 ; per capita : \$541 00. Net Indebtedness : \$8,211,934 ; per capita : \$52 93. Tax per \$100 : \$1 87.

HISTORICAL SKETCH.

The first Europeans who visited the region about the Niagara river found there an Indian tribe known as the Kaw-quaws. At this period, soon after the year 1600, they were settled in several villages about the foot of lake Erie, upon both sides of the river, and numbered about 12,000 souls. It is not likely that any of these villages occupied the site of the present city of Buffalo, since they were generally located some miles from navigable water, in order that they might not be exposed to the sudden attacks of their enemies. The early French missionaries gave this people the name of the "Nutre" nation, because they were of a peaceful disposition and tried to keep at peace with the warlike tribes which surrounded them on all sides. To the northwest, around the lake of that name, were the Hurons; to the southwest were the Erie or Cat nation, and to the east were the terrible Iroquois. In the

attempt to maintain a strict neutrality between the Iroquois on the one side, and the western nations, with whom the Iroquois were constantly at war, on the other, the Kaw-quaws were ultimately nearly destroyed. Tradition says that a last decisive battle between them and the Iroquois was fought about 1643 on Buffalo creek, at a spot near the old council and mission houses, 6 miles above where Buffalo now stands. The conquest of the Kaw-quaws was followed ten years later by the complete overthrow of the Eries in a desperate battle fought about midway between Canandaigua lake and the Genesee river. About the same time the Hurons succumbed to the prowess of the Iroquois, leaving the latter tribe undisputed masters of all the territory now included in New York, Pennsylvania, Ohio, and Canada. From that time on they extended their conquests, until, at its height, their power reached to the Mississippi on the west and to the gulf of Mexico on the south.

The Iroquois originally constituted but five communities, viz, the Mohawks, whose principal towns were adjacent to the Mohawk river; the Oneidas, in the vicinity of Oneida lake; the Onondagas, near Onondaga lake; the Cayugas, on Cayuga lake; and the Senecas, whose territory after the conquest of the Kaw-quaws and the Eries comprehended all that region which lay west of Seneca lake, and which was denominated "the Genesee country". In the year 1712 the Tuscaroras were taken into the confederacy, and given a territory by the Oneidas, adjoining that of the Onondaga tribe. According to a report made to Governor Tryon, October 22, 1723, the Six Nations, as they were called by the English, numbered about 2,000 fighting men, making at least 10,000 souls in all, the Senecas alone comprising half that number. It was a most fortunate thing for the English colonists in America that from the outset this powerful confederacy was friendly to them, for it served as an effectual shield against the hostile incursions of the French and their savage allies. Their war with the French began with Champlain, and continued with few intervals till the peace of Paris in 1763, when France finally lost control over Canada.

Up to this time western New York had formed a portion of French Canada, or, using a more geographical designation, New France. The progress of colonization here, as in all the northern portion of the continent, had been very slow, and, with the exception of trading-posts scattered along at rare intervals from Quebec to New Orleans, the whole country was an unbroken wilderness. Even under English rule but little progress was made, and the revolutionary war found few settlers along the chain of the great lakes. A few forts, however, had been built, which were found to be of invaluable assistance to the British, furnishing not only a safe refuge to many Tories who fled from the colonies, but also convenient starting-points for the expeditions sent out against the border settlements. In this, as in all preceding contests, the Six Nations remained true to their old allies, the British, and, in conjunction with the tory refugees, maintained a border warfare which, for atrocious acts of cruelty, has never been surpassed in the annals of the world. Scarcely a hamlet was spared the loss of some of its citizens. Scarcely a family but mourned the death or captivity of some loved member. The massacres of Wyoming and Cherry Valley were only the most famous of these acts. So horrible did they become that in the summer of 1779 Congress determined to put a stop to them if possible, and to this end sent a combined army of nearly 5,000 men, under General Sullivan, into the heart of the Indian country, with orders to destroy their villages, cut down their crops, and inflict upon them every other mischief which time and circumstances would permit. These instructions were carried out to the letter, and a blow was inflicted upon the Iroquois from which they never recovered.

Although all the Six Nations suffered terribly from this campaign, the Senecas were by far the most injured. Their towns were all destroyed, together with all the provisions they had provided for their winter consumption, and they were driven to the necessity of fleeing to their friends, the British, at Niagara. Great numbers of them actually perished, during the winter of 1779-'80, from starvation and exposure, and from disease induced thereby. They appear to have been provided for at Niagara, but with great difficulty. This led, in the following spring, to active efforts on the part of the officers of the post, under instructions from the British government, to induce them to settle upon lands where they might support themselves by hunting, and raising corn, beans, and such other vegetables as their rude mode of cultivation might enable them to produce. To this end they were located at Buffalo creek, Cattaraugus creek, Tonawanda creek, Alleghany, Nunda, and two or three points on the Genesee river. Naturally they expected to be sustained at the settlements by material aid from the British government, and it was common for some officer or agent of the government to reside at the most important of the new villages. The agent at Buffalo creek seems to have been one William Johnson, who, with Captain Powell and others, came there in the spring of 1780 with hoes, axes, seeds, etc., and by their advice and encouragement assisted the Indians materially in establishing themselves in their new homes. These first inhabitants of Buffalo were mainly of the Seneca tribe, though some Onondagas and Cayugas were of the number. The first permanent settlement is said to have been made by the Seneca chief, Old King, and his family, among whom was a daughter who had married Rowland Montour, a son of the Catharine Montour so famous in the history of these times.

There has been much discussion as to the origin of the name "Buffalo creek" which the English gave to this settlement, but the weight of opinion seems to be in favor of its derivation from the animal of that name, which is supposed in old times to have made regular visits to a "salt lick" on the banks of the creeks, above the site of the present city. The buffalo was formerly found throughout the whole territory of the United States, with the exception of that part east of the Hudson river and lake Champlain, and of narrow strips on the Atlantic and the gulf of Mexico. Before the Europeans came here the country was for the most part an open prairie, produced by the periodical burning over of immense tracts of country by the native inhabitants. All those regions denominated

"oak openings" were once of this prairie character, and furnished feeding-ground for immense herds of buffalo. There is abundant evidence that this animal was found along the south shores of lake Erie as late as the middle of the last century, but that he was ever seen around Buffalo creek by white men is not at all probable. The bleaching bones were left around the "salt lick" on the banks of the creek, and the Indians called the stream "*Tick-e-ack-gou-ga-hawnda*", or, in English, "Buffalo creek". To the village they applied the name "*Te-osah-way*", or, in our language, "place of basswood", owing to the existence of that tree there. The whole locality was known and designated by the English as "Buffalo creek" certainly as early as 1784, as the name was used in the treaty made with the Six Nations at fort Stanwix in that year. The word "creek" was dropped from the title of the settlement about the beginning of the present century. An attempt to change it to "New Amsterdam" about the same time was unsuccessful. Up to 1811 it was spelled "Buffaloe", but the ridicule of the editor of the newly established *Buffalo Gazette* soon caused the superfluous letter to be dropped. Since then the name of "Buffalo" has been undisturbed.

The settlement of the Indians here grew with the Indian traders, and other white men who had associated themselves with the Indians, and it is easy to see that the early white population was of a very mixed character. The first of the traders was one Cornelius Winney, who had his trading-house "at the lake", upon the banks of the Little Buffalo creek (now Hamburg canal), nearly at the junction of the present Washington and Quay streets. This was the first building erected by civilized man in Buffalo, and Winney may be considered the first white resident. He probably came here to reside about 1783-'84, and he remained until after the surrender of fort Niagara to the Americans in 1796. For a long time his was the only house in the settlement. A visitor in 1792 speaks of the place as follows:

There was but one white man there. I think his name was Winney, an Indian trader. His building stood first as you descend from the high ground. He had rum, whisky, Indian knives, trinkets, etc. His house was full of Indians. They looked at us with a good deal of curiosity. We had but a poor night's rest. The Indians were in and out all night, getting liquor.

In 1795, according to Judge Porter, there were three houses in the settlement, "Johnston's, Winney's, and a Dutchman by the name of Middaugh".

From the close of the revolutionary war to the time of the delivery of the forts upon the northern and northwestern frontiers Buffalo creek and the territory around it was subject to the authority of the British. Their claim to jurisdiction was acknowledged without question both by white and by Indian settlers, inasmuch as the settlement had been founded under the patronage of the English government and was wholly dependent upon it for protection, and even for subsistence, since most of its supplies came from fort Erie, on the other side of the lake. With the transfer of the forts on the American side of the great lakes and their connections to the United States in 1796, Buffalo creek came under the control of the United States, though it was still more or less dependent on the British. Their right to the whole of western New York being now undisputed, the Americans began to colonize it in large numbers, and settlements sprang up in many places.

The original charters of Massachusetts and Connecticut included all the lands within certain parallels running due west from the Atlantic to the Pacific. At the same time, the charter of New York covered all the land within the present limits of the state. It is supposed that Massachusetts, previous to the war of the Revolution, gave up the rights and jurisdiction which she claimed under her charter over that portion of New York bounded east by the present dividing-line between New York and Massachusetts, and west by a line so far west of the Hudson as to include all the settlements previously made. As to the territory west of this, apparently no understanding existed, and after the war Massachusetts revived her claim to it. On the 16th of December, 1786, the matter was amicably settled by commissioners at Hartford, Connecticut, an agreement being entered into that confirmed the sovereignty and right of jurisdiction over the whole territory to New York, while it conceded to Massachusetts the right of pre-emption from the Indians of that soil, broadly speaking, west of a line running due north and south through Seneca lake; from this was excepted a strip 1 mile in width running the whole length of the Niagara river (known afterward as the New York reservation), the pre-emption of which was vested in New York. The Indian title was gradually extinguished by treaties made from time to time.

The lands embraced in the cession to Massachusetts by New York were very shortly purchased by a company of which Messrs. Phelps and Gorham were the leaders. In July, 1788, Mr. Phelps bought part of the lands from the Indians. This company had predicated its purchase on its ability to buy the depreciated public paper of the state at a large discount; but the funding of the public debt of the state by the federal government enhanced the value of the state debt to nearly par, and the company was obliged to report to the legislature, in the spring of 1789, its inability to fulfill its engagements, and to ask to be released from so much of its obligation as related to the Indian lands not included in the purchase of the preceding July. The legislature acceded to this request, and soon found a purchaser of the pre-emption rights in relinquished lands in the person of Mr. Robert Morris, of Philadelphia. Mr. Morris sold, in 1792-'93, to Herman Leroy and others, for parties residing in Holland (who, being aliens, could not hold real estate in their own names under our laws), four different tracts of lands, described in four separate deeds of conveyance, including the land upon which the city of Buffalo now stands. This was the famous Holland purchase. The Indian title in these tracts not having yet been extinguished, a council was held with the Senecas

at Genesee, in 1797, at which the Indians gave up all rights in the Massachusetts lands, with the exception of ten reservations, containing in all 338 square miles—a liberal provision for the comparatively small remnant of the Six Nations then remaining in New York. One of these reservations, containing 130 square miles, was located at Buffalo creek.

The Holland Company, as it was called, immediately set to work through their American agents to improve the value of their purchase and to encourage immigration. It became very important to them to secure a landing-place and harbor near the foot of lake Erie, where they might establish a commercial village or city, and as the New York reservation excluded them from the waters of the Niagara, and from the shore of lake Erie 1 mile southerly from the river, the mouth of Buffalo creek seemed the most available spot left. Captain William Johnston, who has been mentioned as having settled here at an early period, had procured of the Indians, through a gift to his son, 2 square miles of land at the mouth of Buffalo creek, including the territory on which now stands part of the city of Buffalo. He had also entered into an agreement that amounted to the life-lease of a certain mill-site and the timber-land in its vicinity, about 6 miles from the mouth of the creek. Although Johnston's title to this land was not considered to have the least validity in law, yet the Indians had the power and manifested the inclination to include it within their reservation, unless a compromise was made with Johnston; and, taking into consideration his influence with them, the company concluded to enter into an agreement with him whereby he gave up his right to the land, in consideration of which the company conveyed to him 640 acres, including the mill-site, and 45.5 acres of the 2 square miles, including his buildings and improvements. So the Holland company got a foothold on lake Erie and determined the site of the embryo metropolis of western New York.

The Senecas lingered about Buffalo creek for many years. The site of the city was in early days their hunting-ground, and they shot squirrels within its limits down to the time of its incorporation as a city in 1832. They were familiar to its streets and visitors in its houses until 1843 and 1844, when, their last lands having been sold, they departed from the home of their fathers, some of them joining their brethren who had previously emigrated to the Cattaraugus and Allegany reservations, and the remainder finding a home upon reservations allotted to them in Kansas. Among them were some of great natural gifts, and others who combined solid worth and weight of character with vigorous intellectual powers. Many were confirmed drunkards and as idle as lotus-eaters, but to the last there remained a few chiefs, wise in council, courageous in action, and dignified in demeanor, who in their presence and conversation vindicated the tradition that as statesmen and warriors the Senecas were proudly eminent among the Six Nations.

In 1797 the Holland company employed Joseph Ellicott to survey their lands in western New York. His name is most intimately associated with the early history of Buffalo. He was a younger brother of Andrew A. Ellicott, then surveyor-general of the United States. He had assisted the latter in laying out the city of Washington, which he adopted as a pattern for the present broad streets, diagonal avenues, and public squares of Buffalo. His plan included most of the principal streets lying south of Chippewa street—that being the most northerly highway of the future metropolis of his imagination. To many of these he gave the names of members of the Holland company, but the inhabitants of the new town sniffed contemptuously at the inharmonious names of Willink and Von Staphorst, Busti and Vollenhoven, Stadintski and Shimmelpennink, and summarily ejected them from the premises. The town itself he called New Amsterdam, but the name never enjoyed popular favor or came into general use. The company continued to use it in their conveyances of lots until 1811 or 1812, when it was dropped and the name of Buffalo was substituted.

The surveys were not completed so that sales of village-lots could be made much before 1804, but sales of farm-lots in the vicinity were made in 1803. In a letter to Mr. Busti in May, 1802, Mr. Ellicott deprecated the delay, saying that the state intended offering the mile strip known as the New York reservation for sale, and that there was "a situation on said lands intended to be purchased, equally or more advantageous for a town than New Amsterdam; so that if the state shall make the intended purchase this summer and offer this spot for sale before New Amsterdam gets in operation, the 'nick of time' will be lost to the future prosperity of that place". The advantages possessed by the "situation" alluded to, viz, Black Rock, were ultimately far more than counterbalanced by the building of the long pier in the Niagara river for the use of the Erie canal, the construction of the pier and breakwater at the mouth of Buffalo creek to protect and keep open the harbor, and the extension of the Erie canal to that place. Both are now included within the corporate limits of the city of Buffalo. The disability of the members of the Holland Land Company to hold a legal title in New York was removed in 1789 by an act of the legislature, and the lands were conveyed to them. Thus the present title to the territory of Buffalo embraced in the mile strip is derived from the state of New York, and to the remainder from individuals composing the Holland company.

In the disposal of lots in New Amsterdam (or Buffalo) Mr. Ellicott was very careful to confine the sale to actual settlers, and to require a certain stipulated amount of improvements in a given time. He often refused to sell lots for the whole purchase money in advance unless buildings were first erected upon them or some earnest given for their erection. This accounts for the slow sale of lots. In the absence of such conditions the original village plat, at the low prices asked, would have been sold before 1820. These conditions, it should be observed, were not for

the usual purpose of increasing the value of the premises and keeping the lien for the purchase money good, but were intended to make every purchaser an actual settler. The result was that, a quarter of a century after the original survey, many lots remained unsold.

The first emigrants to western New York went from all parts of the United States, but for the most part from New England. Among them were many of English, Low Dutch, German, Scotch, or Irish origin, but in most places the New England character was the prevalent trait. It was perhaps due to this that the settlers in Buffalo so early made a movement in relation to schools. On the 11th of August, 1801, Joseph R. Palmer, "by request of the inhabitants", wrote to Mr. Ellicott requesting him to "grant them the liberty of raising a school-house on a lot in any part of the town, as the New York Missionary Society has been so good as to furnish them with a school-master clear of any expense, except boarding and finding him a school-house". Mr. Ellicott at once went to Buffalo to lay off a lot, and the house was speedily erected, the expense probably being met by subscription. It was usual both for young men and for young women to attend this school, which was considered to be of a higher order than any taught in the surrounding country. The school-edifice also served as a place of public worship, meetings being held there whenever the services of a minister of any denomination could be obtained. These meetings were generally attended by all the inhabitants without distinction of sect or party.

Rev. Timothy Dwight, who visited Buffalo in 1804, described it as follows:

Buffalo Creek, otherwise New Amsterdam, is built on the northeast border of a considerable mill-stream which bears the same name. A bar at the mouth prevents all vessels larger than boats from ascending its waters. For boats it is navigable about 8 miles. Its appearance is more sprightly than that of some others in this region. The southwestern bank is here a peninsula covered with a handsome grove. * * * The village is built half a mile from the mouth of the creek, and consists of about twenty indifferent houses. * * * The streets are straight and cross each other at right angles, but are only 40 feet wide. What could have induced this wretched limitation, in a mere wilderness, I am unable to conceive. The spot is unhealthy, though of sufficient elevation, and, so far as I have been informed, free from the vicinity of stagnant waters. The diseases prevailing here are those which are common to all this country. The inhabitants are a casual collection of adventurers, and have the usual character of such adventurers thus collected when remote from regular society, retaining but little sense of government or religion. We saw about as many Indians in this village as white people. The superintendent of Indian affairs of the Six Nations resides here. New Amsterdam is at present the thoroughfare for all the commerce and traveling interchangeably going on between the eastern states (including New York and New Jersey) and the countries bordering on the great western lakes.

The creek is frequently said to unite with the river Niagara. I should say, as I believe every other man would who spoke from his own inspection, that it unites with lake Erie, and that the river Niagara begins 2 miles farther north, at, or rather just below, Black rock. [He evidently mistook Bird island for Black rock.] Here the first perceptible current commences, while at the mouth of the creek the waters, unless agitated by the wind, are perfectly still, and have exactly the same appearance as other parts of the lake. At Black rock, a town which is a mile square has been laid out by order of the state into house-lots. * * * Between this rock and the shore is the only secure harbor on the American, and a much better one than on the British, side of the lake within a great distance. A road is already begun from the spot to fort Niagara, at the mouth of the river, and will not probably be completed within a year.

It is interesting to compare with this account some remarks of Timothy Bigelow, of Massachusetts, in a *Journal of a Tour to Niagara Falls in 1805*. He wrote:

[From Ransom's] to Crow's, at Buffalo Creek, 8 miles. * * * Half the distance from Ransom's was over open country, * * * in which many young chestnut trees are just sprouting from the ground. The rest of the way was through a thick wood, where the growth is of the same kind as in the interior of Massachusetts. At Crow's we could procure nothing for refreshment. The settlement is a village containing about thirty shabby houses, very much resembling barracks. It is situated at the southeastern extremity of lake Erie, on a rising ground, which forms the east branch of Buffalo creek. An old Indian told me that the inhabitants of this place derive their principal support from the Indians, who here receive from the agents of the government their annual allowances, no small part of which they soon appropriate. The Buffalo creek * * * is a lazy and muddy stream. Crow informed me that a strong westerly wind forces the water of lake Erie with such violence on its eastern shore, which is a kind of bay not more than 3 or 4 miles wide, as to raise a tide sometimes 10 or 12 feet high.

From Buffalo we passed along the beach of lake Erie to the ferry across its outlet on the Niagara river, at Black Rock, so called, 3 miles. We were here detained for more than an hour, waiting the pleasure of the ferryman. * * * When at length he arrived, we were almost deterred from attempting the passage, on account of the wretched machine on which we were to be transported. It was a crazy flat-bottomed boat, with low sides, constructed at first of thin planks, and which had apparently begun to decay. In this slender vehicle, navigated by a drunken Irishman, who commanded an Indian and a negro wench, who seemed to be much the ablest of the three, were to be consigned ourselves, with our driver, horses, wagon, and loading, across the most formidable ferry perhaps in the world—a stream three-quarters of a mile wide, 20 or 30 feet deep, and running at the rate of 5 miles an hour. Having no alternative, however, we embarked. Fortunately a fresh breeze was blowing up stream, which, by means of a ragged sail fastened to a pole, enabled us not only to resist the current but to make such progress that in nine minutes we reached the opposite shore in safety. * * * So severe was the drought this summer that we saw young forest trees, in the neighborhood of Buffalo creek, where the soil was upon a bed of rock, which had actually perished for want of moisture, and yet the lake and river were at their usual height. Indeed, we were expressly told that this height was never known to vary unless affected by the wind.

The settlement of western New York was greatly facilitated by the construction of roads. The paths by which the first inhabitants came into the country were mere Indian trails. Often they were obliged to stop for hours in their progress, to construct a temporary bridge to enable them to cross a stream. In March, 1794, three commissioners were appointed to lay out a road authorized by law, from Utica by Cayuga ferry and Canandaigua to the Genesee river at Avon. Judge Porter says in his memoir that in 1797 the only road from Avon to Buffalo was an Indian trail, and that there was but one house on it. The whole country, in fact, was at that time a savage wilderness, and its settlement by whites can hardly be said to have begun until the

beginning of this century. In 1800 a road was made from Avon to Garson's settlement, and this constituted one continuous road from Utica to Buffalo, but in that year only 3 miles of it were completed. In 1803, we learn, there were two roads from Buffalo Creek to Batavia, one of which was 5 miles shorter than the other, but was of more recent date; and of its whole length of 18 miles no less than 13 were of mud, while the old road contained but 8 or 9 of mud out of 25. All the roads of those days were execrable. A framed bridge over a stream was a novelty, and a chinked or covered crossway was a luxury that marked a neighborhood which was getting ahead of the country generally in the march of improvement. The road running east from Buffalo, called "the Buffalo road", was by far the best in the region at that time, and it was so bad that as late as 1812 the slow and circuitous course of trade was directed from Buffalo through the Niagara river to Schellosser, thence by portage to Lewiston, thence by water to Oswego, and up the Oswego river, through Oneida lake and Wood creek, and across a short portage to the Mohawk river, thence by that river and around the portage at Little Falls to Schenectady, and thence over the plains to Albany. Charles Townsend and George Coit, who came to Buffalo as traders in 1811, brought over this route about 20 tons of merchandise—a large stock for that time—at a cost of \$50 per ton from Albany. In that year a stage ran twice a week from Albany to Buffalo.

The first minor civil division in which the territory now occupied by the city of Buffalo was included seems to have been Tryon county, which was set off in 1772, being named after the English governor, and embracing the whole western and middle portions of the province. In 1784 the state legislature changed the name to Montgomery, in honor of the illustrious general who fell in the assault upon Quebec. In 1789 the county of Ontario, embracing the whole of what we now term western New York, was set off from Montgomery county. Genesee county was separated from Ontario in March, 1802, and in March, 1808, the western extremity of the state became Niagara county, Buffalo being made the county-seat, upon the condition that the Holland Land Company should erect a court-house and a jail upon a suitable lot, and convey the same to the county. These were built in 1810. The first court in the new county was held in June, 1808, in a tavern. No further change in the county organization was made until 1821, when Niagara was divided into several counties, of which the present county of Erie was one.

The political machinery of civil government received little attention from the early settlers. Up to about 1805-'06 nothing but the ordinary organization of towns existed, and all the territory west of the Genesee river had been included in the town of Northampton. Buffalo Creek, however, lay as yet entirely without the pale of civilization. Towns now began to be organized in western New York, and on the 8th of February, 1810, the town of Buffalo was created by an act of the legislature, being set off from Clarence, and including all that portion of the state which lay west of the west transit line. The transit lines were meridian lines 16 miles apart, by which the Holland purchase was divided into four separate parcels. The town of Buffalo at its first organization must have contained an area of about 300,000 acres. It was the giant parent of a comparatively dwarfed progeny, for it included what are now known as Grand Island, Tonawanda, Amherst, Cheeklowaga, the northern part of West Seneca, and the city of Buffalo.

From 1809 to the beginning of the war of 1812 quite a number of settlers came into Buffalo and a good many buildings were erected. In 1811 Judge Townsend estimated the number of dwellings at nearly 100 and the whole population at about 500. There were then three taverns and four stores in the place. At that time the population of the Holland purchase, in the estimation of Mr. Ellicott, was a little over 23,000; in 1812 it was probably not far from 25,000. The only portion of the entire purchase where there was any thing like a compact settlement was in the few small villages and upon the Buffalo road. John Melish, an English traveler, who was in this country in 1811, says, in an account of his journey from Buffalo to Batavia, that "the houses were so thick along the road" that he "was seldom out of sight of one". This was far more than could have been said of any other road upon the purchase at this period.

During 1811 fears of a war with Great Britain began to be entertained, and the people of Buffalo soon realized that their position was a dangerous one in case war should be declared. Their anxiety was increased by the fear that the Indians in the vicinity might side with the enemy in case of war; and, notwithstanding the fact that the Indians declared they would remain in peace, so great was the mistrust of them that when hostilities actually began many citizens left Buffalo, and it is probable that not 1,000 remained at the beginning of the war.

The British officer at Niagara received the news of the declaration of war from the British minister at Washington in advance of any official information communicated to the American officers, and measures were immediately taken by the British to capture every thing belonging to the United States within their reach. The first act of open hostility was the capture of a small vessel laden with salt, which lay off the mouth of Buffalo creek waiting for a wind, by two large boats filled with armed men from the British fort Erie. In September, 1812, Lieutenant Jesse D. Ellicott, of the United States navy, was sent to superintend the construction of a fleet on lake Erie. Black Rock was chosen as the place for a dock-yard. While busily engaged there, early in October, Ellicott learned that two British vessels—the brig "Adams", of 6 guns, and the schooner "Catalonia", of 2 guns—had come down the lake and anchored under the guns of fort Erie, and he immediately conceived a plan for their capture. On that very day a detachment of seamen for service under him arrived from New York. Just from a long, dull overland journey, they entered enthusiastically into the affair, as did also some of the citizens of Buffalo, led by the brave Dr. Chapin. At 1 o'clock the next morning three armed boats, with 102 men, started out from

Buffalo creek for the attack. The surprise and success were complete. The vessels were captured and taken down the river; one was burned, but the other was saved and subsequently unloaded. Had this expedition failed, it would have been pronounced the height of presumption and rashness; but, as it proved successful, it was characterized as a "gallant and daring exploit".

During the rest of this year and the early part of 1813, Buffalo played an insignificant part in the drama of war of which our northern frontier was the scene, but in the summer of 1813 she came to the front again. The success of the British at Beaver Dams, in June, made them bold, and they were gradually closing upon the Americans at fort George and Newark. Frequent picket-skirmishing followed, and bold raids into the American territory were performed. One of these took place on the morning of the 11th of July, 1813. A party of between 300 and 400 British soldiers landed just below Black Rock shortly before dawn, proceeded to Black Rock, dispersed the few American militiamen stationed there, and then sacked the place. General Porter, who narrowly escaped from his house at Black Rock, hurried to Buffalo and hastily gathered together a force consisting of about 100 regulars, 50 dragoon recruits, 50 volunteer citizens, and 40 Indians. With these he attacked the invaders most vigorously. After a short, spirited contest the foe were beaten, and driven in confusion to their boats, suffering considerably in the retreat, while the American loss was only some 15 or 20 killed and wounded.

Another British raid, later in the year, ended far more disastrously for Buffalo. In December it was known that preparations were making to invade our territory, but as fort Erie was the seat of these, the point at which the attack would be made was very uncertain. So when, on the night of December 29, a report was given that the British had landed down the river below Squaw island, it was suspected to be only a feint to draw off the force from Buffalo, where it was expected the principal attack would be made, and, accordingly, only a small company of volunteers went to meet them. An unexpected volley from fifty British muskets in the darkness of the night was too much for the raw recruits, and they fled precipitately. All was uncertainty until the daylight revealed a large force embarking in boats higher up the river. The whole American force was at once directed against this new invading party. At this, the detachment that had landed in the morning down the river began to move up, and it was not observed until it began an attack upon the Americans in the rear. This attack, from an unexpected quarter, caused them—mostly volunteers and militiamen—to give way, and it became impossible to rally them. Deserted by a large portion of these troops, opposed by veterans, vastly outnumbered, and almost surrounded, General Hall, the American commander, was compelled, for the safety of the remnant of his little army, to sound a retreat after he had maintained the unequal conflict for half an hour. The gallant Chapin, with a few of the bolder men, retired slowly along the present Niagara street toward Buffalo, keeping the enemy partially in check, while Hall retired to Eleven-Mile creek, where he succeeded in rallying about 300 men, who stuck by the flag. With these he was enabled to cover the flight of the inhabitants, and to check the advance of the invaders into the interior.

The adult male population of the village had gone down to Black Rock early in the morning, leaving the women and children under a strong belief that the enemy would be repulsed, as he had been upon a former occasion; and when the alarm was given that the British and Indians were advancing in full force to Buffalo, a universal panic followed. Horsemen took up females behind them, and, in some instances, children before them, and thus aided them in their escape. Families were in this way separated, and in some cases did not reunite for weeks. So sudden was their surprise, and so destitute of the means of escape were those who were left in the village, that very few saved any thing except what they had upon their persons. This was the case in many instances; for although a few families had taken the precaution to remove a day or two before the attack, still the great mass of them remained. The British and their Indian allies took possession of the village, and proceeded to plunder, destroy, and slaughter. Only four buildings were left standing in the place—the jail (built of stone), the frame of a barn, Reese's blacksmith-shop, and the dwelling of Mrs. St. John, a resolute woman, who, more fortunate than her neighbor Mrs. Lovejoy (who was murdered and burned in her own house), saved her own life and her property. Fearful was the retaliation for the destruction of half-inhabited Newark. Six villages, many isolated country houses, and four vessels were consumed by the flames, and the butchery of innocent persons attested the fierceness of the enemy's revenge. In a letter written from Leroy on the 6th of January 1814, we read:

Many dead bodies are yet lying unburied at Buffalo mangled and scalped. Colonel Marvin counted 33 this morning. I met between Cayuga and this place upward of 100 families in wagons, sleds, and sleighs, many of them with nothing but what they had on their backs, nor could they find places to stay at.

A few families returned within a short time, but general rebuilding did not begin until the following year. Meanwhile, from the 10th of April, 1814, when General Scott assumed command here, until the 17th of September, when the victory of fort Erie brought peace to the Niagara frontier, it was the base of active military operations.

With the close of the war in December of that year Buffalo began to revive, but it was some time before it fully recovered from the set-back it had received. It is to be remarked that the new Buffalo was not the work of a new community, for it was composed for the most part of its former inhabitants. The influence of the war on the growth of the place is shown by the transfers of lots made in the different years by the Holland Land Company. According to the list given by Ketchum, in Appendix 6 to Vol. II of his *History of Buffalo*, there were, previous to 1812, 47 sales of inner and 32 of outer lots or parts of lots; in 1813 and 1814, 16 of each; from 1815 to 1824,

inclusive, 46 of inner, 12 of water, and 30 of outer lots or parts of lots; and in 1825, 39 of inner and 12 of outer lots or parts of lots. From 1826 to 1830, inclusive, 54 inner, 3 water, and 33 outer lots or parts of lots were disposed of, leaving a few, which were gradually taken up in subsequent years.

Little can be said in praise of the social condition of Buffalo in these early years of its existence. In consequence of the intermixture of immigrants from different parts of the country, there was great diversity of habits, tastes, and modes of thinking on many subjects. The habits of the people were loose and irreligious. The sabbath was made a day of business, visiting, or pleasure. Drinking and carousing were by no means rare. Almost all the Indians, here as elsewhere, were depraved and ruined by their taste for "fire-water", and the memoirs of the chief white men show that very many of them were affected by the same cause. Reducing the discordant elements of such a half-civilized community into something like social order was a task which required no ordinary degree of moral courage on the part of those who were the constituted leaders of the work. Even as late as 1818 affairs were in such a state that these men felt it their duty to form a "moral society" for the suppression of vice and immorality. Among other measures, this body passed a resolution—

* * * that after the 23d November instant, the laws of the state prohibiting the violations of the sabbath shall be strictly enforced against all persons who on that day shall drive into the village loaded teams, or who shall unload goods, or keep open stores or shops for the purpose of trading or laboring, or who shall engage in hunting, fishing, etc. Also against all parties of pleasure, riding or walking to Black Rock, or elsewhere.

Naturally one of the most cogent instruments in bringing up the moral tone of the inhabitants was the church. The early settlers held religious services when any one could be found to conduct them, but no church was organized until February, 1812, when Rev. Thaddeus Osgood, an itinerant minister, organized the body now known as the First Presbyterian Church of Buffalo, with 8 male and 21 female members. The war and the burning of the village almost extinguished it, but in 1815 it was resuscitated, and grew as the place grew. In 1823 a brick edifice was built. A Methodist church had been founded in 1809, but it had no permanent organization until 1818. In that year 8 persons, who "called themselves Methodists, mostly transient and poor", were formed into a society. In the early part of the year they erected a small building, 25 by 35 feet, in 48 days, which was the first church edifice in Buffalo. In 1842 the houses of worship existing in the city were: 3 Presbyterian, 2 Episcopal, 1 Baptist, 1 Methodist, 3 German Protestant, 2 African, 1 Unitarian, 1 Universalist, 2 Roman Catholic, and 1 Bethel.

The village of Buffalo was incorporated in April, 1813, but the bustle and incidents of the war prevented all action under the charter then given. A bill giving a new charter was enacted April 5, 1816, and the village accepted it, and was organized under it on the 6th of May following. The trustees appointed by the act continued to hold office until the first election, which took place on the first Monday of May, 1817. The powers of the board of trustees, however, were extremely limited until they were augmented by a new charter in the year 1822. Ordinances were made, and taxes imposed by the freeholders and inhabitants, in meetings convoked by the trustees, who appear to have been mainly executive officers. The first tax ever imposed in Buffalo—one of \$1,400, to be apportioned according to the assessment-roll for that year—was passed in November, 1816; at the same time the inhabitants directed their attention to the security of the village from fire, passed some wholesome precautionary ordinances, provided for the purchase of hooks and ladders, and required the trustees to ascertain the practicability of procuring a supply of water, by means of water-courses, aqueducts, reservoirs, or otherwise, and, if in their opinion the object could be thus obtained, to purchase any real property or privileges that might be necessary. Nothing, however, seems to have been effected under this resolution, except that in the following March a fire company was organized. In 1817 a school was maintained for most of the time, being kept in such rooms as could from time to time be obtained. In that year the first organization under the common-school law of the state took place, the whole village being embraced under one district. A tax of \$554 25 was levied to build a school-house. This was built, but as no conveyance of a lot was obtained the building had to be removed several times. As population increased the district was divided and subdivided, and new schools were opened. In 1832 there were 16 public and private schools in the city, but the scholars all told would not equal in number those attending one or two of the great schools of the present day.

On the 26th of July, 1820, the freeholders and inhabitants adopted a code of by-laws, and an extremely short one it was, consisting of only nine enactments, intended to prevent the keeping of damaged meats, fish, etc.; to compel their owners to remove dead animals; to prevent the firing of crackers, etc., and the lighting of bonfires, always excepting the burning of shavings, in the streets; to prevent nuisances in and obstruction of streets, lanes, alleys, and sidewalks; to enforce cleanliness in market- and slaughter-houses, and make them subject to the inspection of the trustees; and to prevent driving on sidewalks and driving faster than a trot in the streets. These and all the other by-laws enacted before the city was incorporated would hardly fill two columns of an ordinary newspaper. In May, 1821, \$200 was appropriated to build a public market, and it was provided that the rent to accrue from it should "be expended exclusively on making wells and reservoirs". But two days afterward this act was rescinded, and the trustees were authorized to contract with any individual to build a market "without taxing the village". In April, 1822, an ordinance was passed to prevent the sale of meats anywhere "except at the new public market", under a penalty of \$2. In May, 1823, the market-house was appraised at \$306 75, but it does not appear that it

ever became village property. In May, 1823, the first attempt was made, by ordinance, to prevent domestic animals from running at large. In June, 1826, the names of the streets were changed and their Dutch appellations discarded by a resolution of the trustees. In this, being the first year in which any licenses were issued by the village authorities, 14 tavern and 64 grocery licenses were granted. The general tax, including 5 per cent. for the collector, was \$1,270 50. In 1830 the tax was only \$5,000.

The fire department was augmented in December, 1824, by the formation of a second fire company. Nothing further of note seems to have been done in this respect until 1831, when a tax of \$3,000 was imposed for the exclusive purpose of constructing wells and reservoirs and the purchase of fire-engines, etc. In November \$2,000 was paid for a fire-engine and 200 feet of hose, and the third fire company was organized. Two engine-houses had been built and another engine ordered.

The sidewalks of the village were undefined and unregulated until 1825, and the streets were mere roads until 1835. In June, 1826, the village was divided into five ward districts, "for the better improvement of the streets and highways therein". No order for paving sidewalks was made until July, 1829, when Main street was ordered to be flagged and railed at the expense of the owners. In 1831 a general road superintendent was first appointed. From these and previously-stated facts it is apparent that Buffalo had now attained to considerable proportions. In the first few years after the war of 1812 its growth had been slow, but in 1825 it took a start, and from that time to the present its increase in population and wealth has been wonderful. Although the cause of its start in 1825—the completion of the Erie canal—was only an isolated event, yet that with which the Erie canal is synonymous, viz, commerce and navigation, has made this event the keystone of Buffalo's prosperity. The history of this prosperity is to a great extent identical with the history of the navigation and commerce of the great lakes.

The keel of the first vessel on lake Erie was laid on the 26th of January, 1679, by Sieur de La Salle, the renowned explorer. This vessel was built at the mouth of the Chippewa river, a short distance above Niagara falls, for the use of the Jesuit father, Hennepin. It made one trip to the upper lakes, and, on its return voyage, disappeared. Whether its was because this voyage ended so inauspiciously or for some other reason, its successors were very few. After the revolutionary war, as long as the military posts on the northwestern frontier were in the hands of the English, American boats were not allowed to navigate the lakes, and as no settlements of importance existed on them (excepting the old French settlements in the neighborhood of these posts, and they were under the influence and jurisdiction of the British government), few vessels were required, and of course few were built. From 1796 on, however, numerous vessels were launched on the lakes.

Although the Holland company founded Buffalo, or rather New Amsterdam, for the purpose of having a post on lake Erie, its chances for becoming the commercial metropolis that they anticipated looked for a long time very dubious, for its harbor, if it could be called such, was very poor. While the mouth of Buffalo creek was always obstructed by a formidable bar, and sometimes utterly closed by it, Black Rock, just below, presented an excellent harbor, which easily monopolized the infant commerce of the lakes. In 1805 Congress established the collection district of Buffalo Creek, and provided that the collector should reside at Buffalo; but business experienced such inconvenience thereby that, in 1811, Black Rock was made the port of entry for the district during nine months of the year, and Buffalo during the other three months. Up to the war of 1812 nothing had been done to open the mouth of the creek, which, even as late as that time, was in the dry season a mere rivulet.

In 1818, on the application of the citizens of Buffalo, the state legislature authorized the survey of the mouth of Buffalo creek, with a view to the construction of a harbor, and in the next year authorized a loan of \$12,000 for carrying out the work. A pier was built upon the outer side of the channel of the creek, extending into the lake about 80 rods, reaching 12 feet of water; and in 1821 a channel was formed of sufficient depth to admit vessels of ordinary size into the creek, giving assurance of the success of what had been considered a doubtful experiment. On the 19th of August, 1822, was passed the first ordinance "to prevent obstructions of the navigable waters of Buffalo creek within the limits of the village", merely providing against leaving vessels, boats, or hulls unmoored or unfastened.

The construction of a channel and harbor by the citizens of Buffalo won for that place the honor of being the western terminus of the Erie canal. The argument which decided the fate of the rival communities of Buffalo and Black Rock was held before the canal commissioners at the Eagle tavern in Buffalo, in the summer of 1822. Both sides were represented by able counsel, and the cause was the most important ever argued in Erie county. De Witt Clinton presided and summed up the arguments. Buffalo won the day, and Black Rock sank into an obscurity from which it finally disappeared when it was incorporated within the limits of Buffalo. The Erie canal was opened for navigation on the 26th day of October, 1825. A procession was formed in which rode De Witt Clinton, who, with a committee from New York, had arrived the previous evening. They were escorted to the canal, where they embarked upon the canal-boat "Seneca Chief", which then proceeded upon the first eastern trip ever made through the Erie canal. The remainder of the day was devoted to banquets, speeches and odes, hymns of praise, and solemn prayer. The future greatness of Buffalo was secured. The tide of its prosperity began to rise at once. Its population of 2,412 in 1825, rose to 8,636 in 1830. Its subsequent development into a city was the natural fruit of the labors of the men who made for it a harbor and fixed it as the terminus of the Erie canal.

The state legislature passed an act to incorporate the city of Buffalo, April 20, 1832. On the 26th of May an election was held, and on the 28th the first city government was organized. E. C. Sprague, in speaking of the condition of the place at that time, says:

It was a little city erected upon the substance of things hoped for rather than things seen. It contained a few scattered brick buildings, and perhaps twenty handsome dwellings, mostly of wood; but the bulk of the city consisted of frame houses, generally from one to two stories high, even on Main street. * * * The streets were unpaved, and the darkness of Main street was made visible by a few oil lamps. * * * The daily street costume of some of our leading citizens in 1832 was a black or blue dress coat, with costly gilt buttons, a voluminous white cravat, a ruffled shirt, accompanied by the "nice conduct" of a gold-headed cane. Main street presented a picturesque variety, including elegantly-dressed gentlemen and ladies, blanketed and moccasined Indians, and emigrants in the strange costume of foreign lauds. Most of the business was done upon the west side of Main street, between Mohawk and Exchange. * * * It appears by the directory of 1832 that the city contained 6 churches, 8 "institutions", including some debating societies, 2 banks, and an insurance company, and a library of "nearly 700 volumes". * * * Sixty mails a week during winter and 88 during the season of navigation were "received, made up, and dispatched at the post-office". Of the amount of property shipped from this port it is stated that no certain information could be obtained, but we are informed that there were "10 storehouses", for the transaction of lake and canal business. Even then, however, the steamboats on the lakes, though few in number, were among the best in the country, and were crowded with passengers, who had arrived from Albany on the canal and were seeking a home in Ohio and Michigan. There were some 40 manufacturing establishments in the city, perhaps altogether not equaling in capital and men employed one of the great establishments of the present day.

Mr. Sprague says that "the city was visited in 1832, and in other years, by cholera and by fire", but gives no details. As to his statement that "during the speculations of 1835 it rose 'like a rocket', and in 1837, 'dropped like a stick'", abundant information is furnished by Guy H. Salisbury in a paper on "Buffalo in 1836 and 1862". He says:

The year 1836 will long be remembered as one of crisis, not only in our own locality, but throughout the nation. It opened with universal prosperity apparently covering the land; it closed with almost universal bankruptcy spread widely around. The cause of the change was speculation, in Buffalo as elsewhere, chiefly in land. One citizen of Buffalo, of great respectability and unblemished integrity, then advised the purchase of land at \$125 per foot, that in three years afterward could not have been sold for \$25 per foot. Another valued improved lots at \$60 per foot that were subsequently sold, after 12 years' interest, taxes, and assessments had been paid, for \$7. As far as the records show, there were some 12,000 deeds, mostly for city property, recorded during the period spoken of—being about 3,000 more than had been made in the entire county since its organization a quarter of a century previous. Assuming that there were as many transfers by contract as by deed—a low estimate—the aggregate number of conveyances must have reached nearly 25,000, and the entire amount of purchases could have been little less than \$25,000,000. The buildings erected here during 1835 and 1836 were estimated at that time to have cost \$2,830,000. Some of them were palace-like mansions, costing from \$20,000 to \$30,000 exclusive of their extensive and valuable grounds. But the crash was sure to come, and when it did come the collapse was complete. It was many years before Buffalo fully recovered from its effects. The unnatural stimulation of business and the subsequent depression made an important epoch in Buffalo's history.

In 1836 the city had less than 16,000 inhabitants. It had but a single street paved, and that for only one-fifth of a mile in length. It had but one mile of sewers, imperfectly constructed, scattered through three streets. There was but a single railroad running into the city—that from Niagara falls—of less than 20 miles in length, with no connection with any other road. There were but four omnibuses, making hourly trips through a part of Main street, and literally a "one-horse railroad", that made occasional trips between the Terrace market and Black Rock ferry. The entire receipts of flour during the year were 139,178 barrels; of wheat, 304,090 bushels; of corn, 204,355 bushels; of oats, 28,640 bushels. The canal tolls collected here in 1835 amounted to only \$106,213. The shipping belonging to the port in 1836 aggregated but 8,541 tons.

The first elevator in the world was built in Buffalo. Here, in 1841, Joseph Dart determined, as he says, "to try the use of steam-power in the transfer of grain for commercial purposes." The "experiment from the very first working was a decided and acknowledged success". Dart says that the elevator, "a simple apparatus, consisting merely of a series of buckets attached to a leather or canvas and rubber belt revolving upon pulleys", was invented by Oliver Evans, a Delaware miller, in the latter part of the last century. This simple apparatus in time came to be used in all flouring-mills. Its application to the transfer of grain in its movement toward a market was an idea of Dart's—an idea from which has sprung the mighty elevator of the present day.

In 1841 it became evident to Dart that there was to be a very speedy and immense increase in the future grain business of this port, and that this increasing trade demanded largely-increased facilities for its accommodation. Already, with nearly 2,000,000 bushels received in 1841, unfavorable delays in the transshipment at this port were frequent, and were the occasion of much vexation and expense. Up to this time the universal method of transfer was to raise the grain from the hold of the vessel in barrels, by tackle and block, to weigh it with hopper and scales swung over the hatchway of the canal-boat, or carry it into the warehouse in bags or baskets on men's shoulders. The most that could be accomplished in a day, with a full set of hands, was to transfer some 1,800 or 2,000 bushels, and this only when the weather was fair. Dart's first elevator, erected in the autumn of 1842, raised without difficulty 1,000 bushels an hour at the start, and later, by putting the buckets nearer together, it raised 1,800 or 2,000 bushels per hour. Its storage capacity was 55,000 bushels. In 1865 there were 27 elevators, besides 2 floating elevators, storing, some of them, 600,000 bushels each, and altogether fully 6,000,000 bushels, and capable of moving in a single day more than the entire receipts at this port at the time Dart's first elevator was built.

The subject of sewers seems to have attracted attention first in 1834-'35. Sewers were then constructed in Ellicott and Oak streets, but of a very inferior character. They were but 5 or 6 feet deep, constructed of dry brick,



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with a board bottom, the bricks laid up progressing inward until they met at the top, and held in place as soon as laid by the soil thrown upon them. Even these wretched sewers did good service for many years, but they have been replaced by sewers of modern construction. In 1847 a committee of the board of aldermen was created, called the "committee on paving, sewers, and lights". The committee had its hands full. The call for paving was pressing, and paving was begun at once on a very large scale. Public lamps, of which there had been none, were erected on Main street—oil lamps—so insufficient as to be a constant subject of ridicule for the local editors; and the first great receiving-sewer in Michigan street, from the canal to Batavia street, was constructed. Its cost was at that time considered enormous, the tax proposed being \$12,500—a sum then unprecedented in such improvements. Several minor sewers were constructed during the season of 1847, and on February 15, 1848, the committee submitted a report recommending a general system of sewerage. The report contemplated so large an expenditure as somewhat to alarm the property-holders, and was not adopted. Within a few years, however, its recommendations were in the main carried out, and the city was provided with what was then a satisfactory sewerage system.

In 1847, and for several years following, Buffalo was essentially a maritime town. Its harbor was serviceable but narrow and inconvenient, and the frequent arrivals and departures crowded the water-way so as to give an air of wonderful life and activity to the region of the wharves. Passenger-steamboats were in their glory; elevators were not yet universally adopted, and vast numbers of longshoremen were supported by handling freight by inconvenient processes; canal-boats were small and numerous. Gradually the bustle ceased; elevators drove away the longshoremen; the harbor itself grew apace; new canals were opened, basins constructed, and a larger commerce diffused itself over a larger surface, and made a smaller exhibit than before. Railroads and propellers ruined the business of the "floating palaces", and they were left to rot at their wharves. Buffalo flourished year by year from 1847 to 1857, affected by no serious drawbacks, dependent mostly on its commerce, and the manufactures which commerce stimulated into existence, and with a gradual yet certain transfer of the passenger traffic from the water to the land-routes. The panic of 1857 destroyed the illusive prosperity. Real estate sank rapidly to a rational value; elevators sent the wholesale trade in merchandise to the seaboard cities. Gradually recovering from the effects of the panic, the city resumed its wonted prosperity, but learned a lesson from the past. It needed a permanent business, separated from the lake commerce and independent of its fluctuations, to hold it steady in future crises. It found the object of its search in manufactures, and in a short time Buffalo changed from a maritime to an essentially manufacturing city, and so it has remained up to the present time.

The population of Buffalo, in which there was originally a large New England element, now contains a very large proportion of Germans. The first German to put foot on the soil of Buffalo came in 1821. In 1828 about 70 had already settled here, and in that year a number of other families came. Mr. Sprague says that—

These emigrants were the forerunners and forefathers of that great German population which has contributed so largely to the prosperity, and exercised such a powerful influence upon the character, of our community. What that influence is likely to be in the future may to some extent be judged by a single fact. It appears from the report of the board of health for 1879, that in 1878, of the children born in this city, 1,975 were of German descent; of all other descents, 2,056—a difference of only 81.

BUFFALO IN 1880.

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

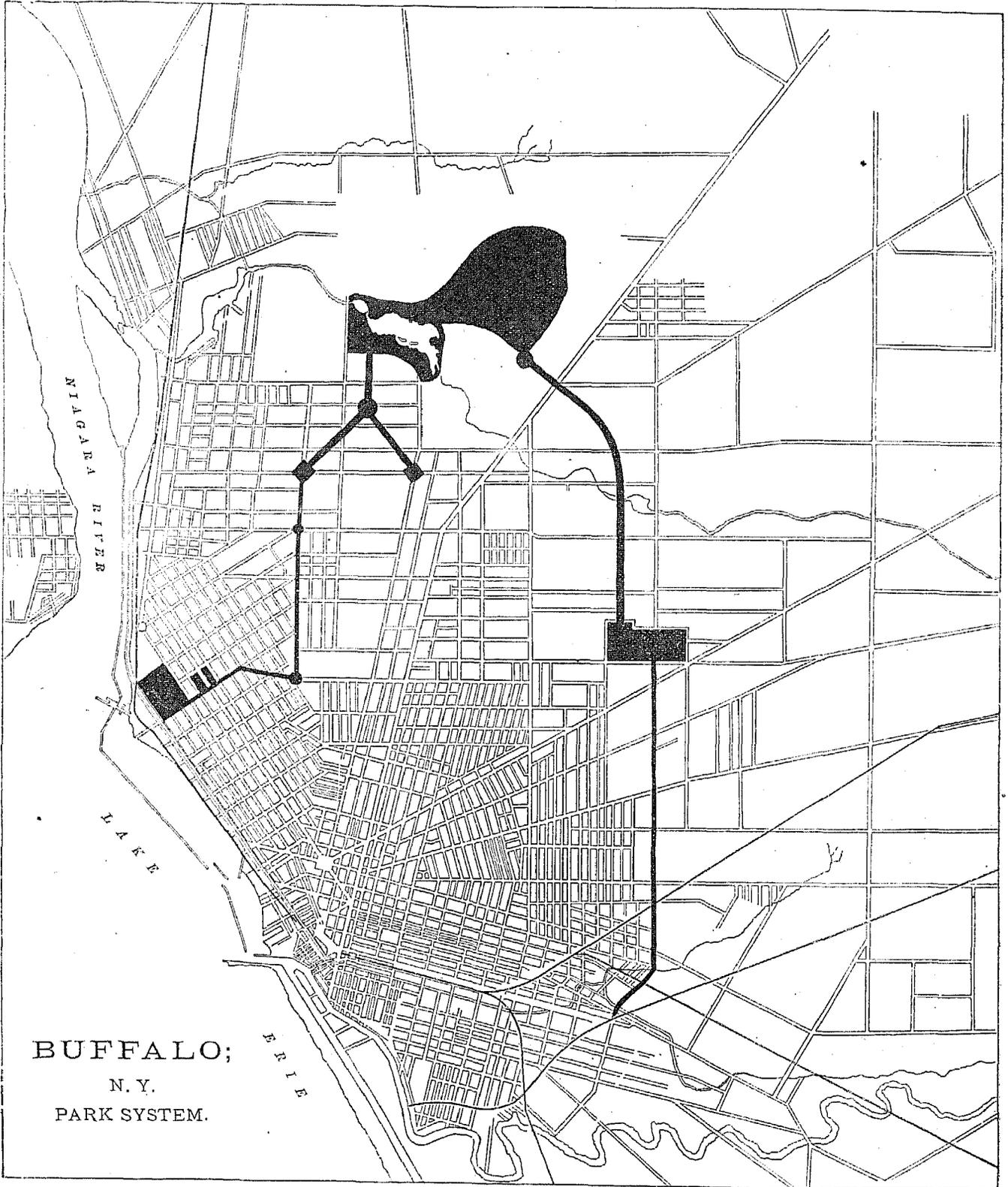
LOCATION.

Buffalo, a city, port of entry, and the seat of justice of Erie county, lies at the eastern extremity of lake Erie and at the head of the Niagara river, in latitude $42^{\circ} 50'$ north, longitude $78^{\circ} 52'$ west from Greenwich, and is 300 miles west of Albany by the Erie canal. The city is delightfully situated, having a water-front of almost 5 miles, with numerous substantial and extensive piers, breakwaters, basins, and canals. The city extends down the Niagara river 5 miles, and at right angles with it almost the same distance, but the northern and eastern portions are not very thickly settled. The harbor is formed by the Buffalo river, a small stream, which is navigable for about 2 miles from its mouth. The entrance is protected by a breakwater, 1,500 feet long, on the south side of the river, and there is also another on the north side, by which a capacious harbor is formed. The site on the lake-front gradually rises, and at a distance of about 2 miles becomes an extended undulating plain, with an average elevation of 50 feet above the surface of lake Erie. A portion of the water-front is a bold bluff rising 60 feet above the water, and affording a fine view of the city, Niagara river, the Canada shore, lake, bay, and the hilly country to the northeast.

RAILROAD COMMUNICATIONS.

Buffalo is touched by the following lines of railroad:

The Buffalo and Southwestern railroad, to Jamestown, on lake Chautauqua, is operated by the New York, Lake Erie, and Western railroad.



BUFFALO;
N. Y.
PARK SYSTEM.

GAS.

There are 3 gas-works in Buffalo, all owned by private corporations. Their average daily production is as follows: Buffalo Gas Works, 240,000; Buffalo Mutual, 160,000; and Citizens' Gas Light Company, 150,736 cubic feet—making a total of 550,736 cubic feet. The charge per 1,000 feet is: To private consumers, \$2 50, less 10 per cent.; and to the city, \$2 net for lamps, and \$2 25 net for public buildings. There are 5,030 street-lamps, and each one costs the city annually about \$26, including lighting, care, etc.

PUBLIC BUILDINGS.

The city owns and occupies for municipal purposes, wholly or in part: The city hall, police headquarters and 8 police stations, municipal court-rooms, fire-department headquarters and 21 station-houses, and 8 markets. The total valuation of all the city property, including land, but not including the city hall, is \$5,241,945. The city and county hall is owned in common with the county, and its total cost was \$1,328,675 78. The city paid half of this and the county half; but as the city is part of the county it paid as such also, so that the city's portion was nearly five-sixths of the total cost, or \$1,107,244 65.

PUBLIC PARKS AND PLEASURE-GROUNDS.

Total area of all parks and approaches, 600 acres, as follows:

The *Park*, area 350 acres, is situated 4 miles north of the city hall, and has a quiet pastoral landscape, with little architectural or horticultural decoration. Its most notable features are a grand sweep of undulating turf 150 acres in extent, and containing many large, well-grown trees, 46 acres of water in an irregular basin about 25 feet below the general level of adjoining slopes, and 3 groves of natural wood.

The *Parade*, area 56 acres, is situated 2½ miles east of the city hall, and consists of a plain with a gentle and uniform slope. There are 20 acres of smooth turf well adapted for military drills or popular sports, a large refreshment-house, and ample accommodations for social festivities.

The *Front*, area 32 acres, is situated 1½ mile northwest of the city hall on the crest of a steep bluff, 50 or 60 feet above the level of lake Erie, at the mouth of the Niagara river. Its special feature is the extensive view afforded by the elevation of the site. This park adjoins the military reservation of fort Porter, and, as the latter is always open to the public, the area of the park is practically increased to 50 acres.

In addition to the above there are 8 small circles and squares in various parts of the city, with a total area of 42 acres. The park-approaches consist of: One avenue, 100 feet wide and 2 miles long, from the Parade south; 1 parkway, 200 feet wide and 2 miles long, from the Parade to the Park; 1 parkway, 1½ mile long, 200 feet wide; and 1 avenue, 2 miles long, 100 feet wide, connecting the Park with the Front. The accompanying diagram of the city shows the location of the several parks and their approaches.

The following table shows the statistics of cost and the estimated number of annual visitors to the park:

	Total.	Park.	Parade.	Front.	Places.	Approaches.
Cost of land and construction.....	\$1,250,000	\$610,000	\$100,000	\$105,000	\$50,000	\$325,000
Cost of annual maintenance	20,000	10,500	2,000	1,500	2,000	4,000
Estimated number of visitors annually:					Not recorded.	
On foot	125,000	40,000	40,000	45,000	Do.	
In carriages	700,000	250,000	175,000	275,000	Do.	
On horseback	7,000	4,000	1,000	2,000		

The system of parks and approaches was designed by Messrs. Frederick Law Olmstead and Calvert Vaux. All the lands acquired here have been worked over, and about 75,000 trees and shrubs, embracing 400 different varieties, have been set out in plantations. All the grounds have been provided with ample surface and sub-drainage, while the sewerage and water-supply systems of the city have been extended in every direction.

The parks are controlled by a board of 16 commissioners, inclusive of the mayor, who is *ex officio* a member. One-third of the board is appointed biennially by the mayor and confirmed by the common council. The term of office is six years, and the members receive no salary.

PLACES OF AMUSEMENT.

Though Buffalo is well provided with theaters, halls, etc., no detailed information regarding them was furnished.

DRAINAGE.

The principal part of the city of Buffalo is bounded along its west bank by the Erie canal and its basins, which shut off its shore from the open waters of lake Erie. The water used to supply the locks of the canal below, and

largely to supply mills situated opposite the lower part of the city, is drawn in through the open slips, and passes slowly through the canal, affording a perceptible current, but with no sufficient velocity for the removal of organic matter before its decomposition. At the south end of the main part of the city, a branch of the Erie canal, called the "Main and Hamburg Street canal", 1 mile long and 100 feet wide, penetrates the city in an easterly direction.

This canal, the harbor, and the Erie canal proper bound this principal portion of the city and receive all its waste water, whether surface-wash or sewer flow.

East of the city a broad, incompletely-settled area reaches some miles out to extensive stock-yards. North of the ridge, substantially on the line of High street, is a largely built-up district, of which the drainage-flow is naturally toward the north, and thence by natural depression westerly to the canal.

This district includes the Park and the extensive buildings and grounds of the state lunatic asylum.

The drainage of the central portion of the city is of that natural-growth sort which begins with wooden and stone culverts, and becomes of better and better quality as time goes on and as brick and sewer-pipe are more largely used. Sewers were built here and there as they were needed in a time of small population, and in many cases were extended later to districts for which their older and lower portions were too small. Additions, alterations, and emendations have been carried out from time to time, according to requirements and according to the changing notions of citizens and of city engineers. Even now, if a sewer is called for by property-owners, it is built without reference to any well-matured plan, but according to a rough judgment of present and future needs. The result, as is indicated by the sewer-map, is a very costly and not very efficient medley of sewers of various sizes, many of which have no record but that based on tradition. The more recent work is, so far as the records of the engineer's office are concerned, well described. Most of these sewers, old and new, are without manholes, and a large proportion of them have their mouths entirely submerged. There is no pretense of ventilation, and the sewer-gas difficulty is as troublesome here as in many of the older eastern cities.

The most palpable controllable nuisance of a few years back was the deficient drainage of the flat eastern district, in which the stock-yards are located; the natural streams were sluggish, many depressed lots were filled with stagnant water, and filth and saturation pervaded the whole district. In 1876 this difficulty was largely remedied by the construction of a very large sewer, built to include the waters of Mill creek, starting in the vicinity of the stock-yards, and delivering into the head or eastern end of the Hamburg canal. This sewer, at its lower part, is 12 feet wide and 9 feet high. Above Swan street it is reduced to 10 feet wide and 6.5 feet high; and thence to its upper line, at the south line of Batavia street, it is reduced to 5 by 7.5 feet, 4.66 by 7 feet, 4.1 by 6.25 feet. Its total length is 11,143 feet. It is one of the most important sewers in the city, and was built at a contract price of \$78,600. The northern drainage area, "Bird Avenue sewer district", north of High street, was next provided with a sewer, called the Bird Avenue sewer, which delivers into the Erie canal at the foot of Bird avenue. This is of recent construction.

The Mill Race sewer and the Bird Avenue sewer were both built under the direction of George E. Mann, esq., city engineer. Although affording relief to the districts to which they furnish outlets, they of course only aggravate the foul condition of the canals. At the present time (1880) the most serious problem in connection with the sewerage of Buffalo is connected with the purification of the Main and Hamburg Street canal. Some relief was secured by the use of forcing-wheels to establish an artificial current, leading to an indraught of fresh water from lake Erie, but the canal is still in a most foul and objectionable condition. Mr. Mann, in 1875, suggested as the only feasible means of remedying the condition of this body of water the construction of a large intercepting sewer, beginning at Mill Race sewer, intercepting all the sewers of the city as far as Albany street, 1 mile above Bird avenue, and delivering there into Niagara river, of which the surface is 4 or 5 feet below the level of the canal.

This project was taken up by J. S. Youngs, esq., city engineer, early in 1880. In March, Mr. Youngs was authorized by the city council to employ "one or more sanitary engineers to examine and assist in perfecting his plans for a proper system of sewerage for the whole city, and especially for a speedy and permanent abatement of the Hamburg Canal nuisance", \$3,000 being appropriated to defray the expenses attending the preliminary work on the plans, or to pay said sanitary engineers. Mr. J. W. Adams, of Brooklyn, and Mr. Moses Lane, of Milwaukee, were selected for this service. Their report, submitted to the city council July 29, 1880, recommended the construction of a sewer along the north bank of the Hamburg canal, thence through private property to the Terrace, through the Terrace and Court street to Fourth street, and thence parallel with the canal to the outlet at Albany street. The cross-section of the sewer at the upper end of the canal was to be equivalent to a circle 11 feet in diameter. At Genesee street the section was increased to the equivalent of 12 feet in diameter, and beyond Pennsylvania street it was to be a full circle 12 feet in diameter. The level of the invert of the sewer at Hamburg street was to be 5 feet below the ordinary level of the canal, and the grade of 1 to 5,000 throughout its length brought its invert at Albany street about 9 feet below the level of the canal and about 4 feet below the ordinary level of the river. It was to be furnished with a flushing-gate at Hamburg street, and another at Ohio Basin slip, securing a strong flow at all times, the amount taken in at Hamburg street being sufficient for the purification of the canal by an equivalent indraught of fresh water from the lake. This sewer was to intercept all of the sewers of the city discharging across its line, and, for relief during storms, overflows were recommended at Georgia, Virginia,

Hudson, Jersey, and Connecticut streets. A subsidiary sewer was recommended to be laid in Genesee street, giving a more direct outflow to the sewage of a large area whose drainage now flows to the Hamburg canal. The estimated cost of this sewer was about \$1,700,000, not including the serious item of right of way.

Final action has not to this time (December, 1880) been taken. The works described above relate exclusively to this principal part of the city, which lies within the angle of the Erie and the Hamburg canals. The more easterly and southerly portions of the city are still little improved in the matter of drainage.

SANITARY AUTHORITY—BOARD OF HEALTH.

By the revised city charter, the board of health of Buffalo is composed of the comptroller, the city engineer, and the president of the common council. In addition to this the board appoints a city health physician, who is associated with it. The annual expenses of the board when there is no declared epidemic is \$12,500, as follows: For salaries of health physician, canal inspector, and pest-house keeper, \$2,916 25; for abating nuisances in Main and Hamburg Street canal, \$6,650; and for incidental expenses, \$2,933 75. In case of an epidemic the expenses of the board are limited to no fixed sum. The authority of the board in ordinary times is confined to recommending to the common council "such work as it deems necessary". By the city charter the board is required to take effectual measures to prevent the entrance of pestilential or infectious diseases into the city, to abate nuisances, and to exercise a general care over the sanitary condition of the city. During epidemics the authority of the board is unlimited. The street commissioner, salary \$2,000 per annum, acts as the executive officer of the board. There are 10 district health physicians and 10 health inspectors appointed by the board, but none of them have police powers. The board meets once a week and disposes of any business brought before it. When nuisances are reported (there being no regular inspections made) the complaint is referred to the street commissioner, "for the purpose of having the same inspected". In the case of defective house-drainage, privy-vaults, cesspools, and sources of drinking-water, the health inspectors examine and report to the board. In case of defective sewerage the board recommends the necessary means of correction to the city council. The board exercises full control over the conservation and removal of garbage. The board has no regulations concerning the pollution of streams and harbors. Excrement is removed by persons who are licensed by the board. Burial permits are granted by the city clerk on certificates of death signed by the attending physician, and these certificates must be presented within 24 hours after death.

INFECTIOUS DISEASES.

All small-pox patients are isolated; either at home, when the house is strictly quarantined and a sign placed on the door, or removed to the public pest-house, situated on Ferry street, in the northeast corner of the city near the city line. Scarlet-fever patients are neither isolated nor quarantined at home. All children sick with contagious diseases are excluded from the public schools, as are also all children who are members of a family in which diseases of a contagious nature exist. Vaccination is compulsory, and of late years it has been done at the public expense.

REGISTRATION AND REPORTS.

Diseases are not registered. A record of all deaths is kept by the city clerk. The board makes no report; the health physician, however, makes an annual report, which is published in pamphlet form for distribution. Dr. A. H. Briggs, health physician, who furnished the above information regarding sanitary matters, writes: "The medical profession are united in the opinion that the board of health should be composed in whole or in part of medical men."

MUNICIPAL CLEANSING.

The following, from the mayor's annual report for 1880, is all that could be obtained regarding the street-cleaning, etc., of Buffalo:

The condition of the streets and alleys during the year has been no worse, and perhaps better, than in former years. The contract for cleaning the same was awarded, covering from May 15, 1880, to May 15, 1881, for the sum of \$17,900. It is pretty certain that the work could not be done any more thoroughly than it has been done, for that sum. * * * To save labor the contractors wet the streets down so as to make the mud very disagreeable to both vehicles and pedestrians; the hot sun then causes sudden and abundant evaporation, deleterious alike to health and comfort. Some of our most enlightened citizens and physicians are loud in condemnation of the system, and it is evident that if the paved streets are properly cleaned and swept, the need of sprinkling, for any purpose, would be removed, while the expense of sprinkling would go far toward meeting the expense of thorough cleaning.

POLICE.

The police force of Buffalo is appointed and governed by the board of police commissioners, a body composed of the mayor *ex officio*, the superintendent of police, and one other person as acting commissioner, who is nominated by the mayor and confirmed by the city council. The mayor, and the acting commissioner appointed by him, meet and select the superintendent of police, who holds office for five years, or until his successor is qualified, and is required to give bonds for the faithful performance of his duties in the sum of \$10,000. If at any time the mayor and the acting commissioner shall fail to agree upon a suitable person, the fact is communicated to the city council

and the president of that body joins with the commissioner for the purpose of selecting a superintendent of police. The superintendent is the chief executive officer, subject to the rules and regulations of the police department and the orders of the board of police; his salary is \$2,300 per annum. The members of the force, in the several grades, and the salaries of each, are as follows: 8 captains and 9 deputies, at \$1,000 a year each; 16 sergeants, at \$850 a year each; and 142 patrolmen and 16 doormen, at \$750 a year each. The uniform consists of a frock coat, pantaloons, and vest of navy-blue cloth, the pantaloons having a white welt on the outer seam, and a navy-blue cloth cap, with wreath surrounding a number in white metal. The men furnish their own uniforms. Locust batons are provided by the department; the members of the force are supposed to carry revolvers, which they furnish themselves. The patrolmen's hours of service are, out of every 48, 18 on street duty, 18 on reserve, and 12 off duty. The force patrols all the streets in the city.

During the year 1880 there were 9,012 arrests made by the police, the principal causes being: Assault and battery, 1,302; burglary, 98; disorderly persons, 125; disorderly conduct, 1,880; drunkenness, 2,535; insanity, 97; larceny (all grades), 863; vagrancy, 1,047; and malicious mischief, 226. They were disposed of by fines, imprisonment, held for trial, turned over to other institutions, and some discharged. The total value of property reported to the police as stolen during the year was \$26,837 53, and of this \$14,713 59 was recovered and returned to the owners. The number of station-house lodgers during 1880 was 3,203, as against 2,497 during 1879. Free meals are not provided for these lodgers. There were 256 lost children found and returned to their homes by the police during the year. By the regulations, the police are required to co-operate with the fire department by attending all fires for the purpose of protecting property and keeping order, and with the health department by reporting all nuisances. Special policemen are appointed by the police board when their services are required. Their pay must not exceed \$3 a day, and, while on duty, they have the same standing as the regular force. The yearly cost of the police force (1880) is \$164,000 58.

FIRE DEPARTMENT.

During the present year the Buffalo fire department has been re-organized and its management placed under the supervision and control of 3 commissioners, appointed by the mayor. For a long time the department had been conducted in part on the paid and in part on the volunteer plan. The volunteer companies have been disbanded, the city buying their effects, and Buffalo now has a paid fire department, the working force of which consists of 187 men, 81 horses, 14 steam fire-engines, 14 hose-carriages, 5 chemical engines, 3 hook-and-ladder trucks, and about 24,500 feet of leather hose. The new arrangement has hardly been in operation long enough to make possible an extended report on the working of the department. It is reasonable to expect, however, that the greater efficiency of a paid over a volunteer department will soon become apparent to the citizens.

PUBLIC SCHOOLS.

The number of buildings employed for school purposes in Buffalo is 53, of which 42 are the property of the districts in which they are located, 5 are rented, and 6 are furnished by charitable institutions in which the schools are maintained for the inmates. Of the buildings owned by the city, 38 are of brick, 3 are of wood, and 1 is of stone. The average number of teachers employed during the year 1880 is 439. The whole number of pupils registered in the several schools in the city during the school year ending December, 1880, was 18,529, and the average daily attendance was 14,822—nearly 80 per cent. of the registration. In his annual report for 1880 (from which the above is taken) the superintendent says:

The number of children of legal school age, or between the age of 5 and 20 years, residing in the city, is estimated at about 50,000; of this number there are probably 33,000 between the age of 5 and 16 years, the usual limits of the age of pupils attending the public and private schools. The number of children attending the public schools in the last year, not including the Central school, in which the pupils will average more than 16 years, was about 14,000, and the number of pupils in parochial and private schools about 9,000, or, in all, 23,000, proving that almost 10,000 children between the age of 5 and 16 years were irregular in attendance at school, wholly deprived or disinclined to accept school privileges. Doubtless a great many of these children are usefully employed, many are unable to attend school for various reasons, but a large proportion of the number are truants, or idle and vicious children, who should be compelled to attend, not the district schools, but schools specially provided for their accommodation.

TRADE AND COMMERCE.

The following summary, regarding the trade and commerce of Buffalo for 1880, is taken from the statistics prepared under the direction of the Buffalo board of trade:

The receipts of flour and grain by lake aggregated 112,053,702 bushels, including flour reduced to its equivalent of wheat. The railroads centering here, with the exception of the Lake Shore and Michigan Southern, do not make any report of their traffic; the receipts of grain by this road, added to the receipts by lake, given above, give a total of 150,241,502 bushels. The exports by lake for the past season included 589,670 tons of coal, 114,125 barrels of cement and plaster, 225,982 barrels and 17,725 tons of salt, and 25,670 tons and 21,084 bars of railroad iron. The first arrivals by lake this season were, steam, March 19, and sail, March 20, both vessels being from Toledo. The Welland canal opened April 30 and closed November 27; the north channel of the straits of Mackinaw opened April 5; the Sault Ste. Marie canal opened April 20 and closed November 15.

MIDDLE STATES: BUFFALO, N. Y.

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COMMERCE AND NAVIGATION.

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

Customs district of Buffalo Creek, New York.	1879.	1880.
Total value of imports.....	\$3,307,693	\$3,742,631
Total value of exports:		
Domestic.....	\$224,705	\$325,027
Foreign.....	\$7,791	\$4,958
Total number of immigrants.....	815	1,017

Customs district of Buffalo Creek, New York.	1879.		1880.	
	Number.	Tons.	Number.	Tons.
Vessels in foreign trade:				
Entered.....	473	81,134	576	88,652
Cleared.....	420	70,266	549	81,874
Vessels in lake trade:				
Entered.....	3,444	2,029,260	4,579	2,702,638
Cleared.....	3,523	2,029,402	4,624	2,717,073
Vessels registered, enrolled, and licensed in district.	220	102,102	219	101,257
Vessels built during the year.....	9	1,936	9	2,152

MANUFACTURES.

The following is a summary of the statistics of manufactures of Buffalo for 1880, being taken from tables prepared for the Tenth Census by Silas J. Douglas, chief 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 18 years.	Females above 15 years.	Children and youths.			
All industries.....	1,183	\$26,847,937	15,033	1,795	1,193	\$7,442,109	\$27,552,088	\$42,937,701
Agricultural implements.....	4	341,500	255			86,773	129,800	423,500
Baking and yeast powders (see also Drugs and chemicals).....	7	38,200	13	1	1	6,950	61,800	79,400
Belting and hose, leather.....	3	120,000	39		21	18,500	285,000	322,000
Billiard tables and materials.....	3	13,500	5		1	3,500	7,100	16,060
Blacksmithing (see also Wheelwrighting).....	59	66,175	65		4	33,227	41,108	121,945
Bookbinding and blank-book making.....	6	73,800	37	44	3	30,600	53,900	104,100
Boots and shoes, including custom work and repairing.....	131	490,146	549	84	47	268,309	579,157	1,068,296
Boxes, fancy and paper.....	4	10,500	10	72	12	15,100	44,190	72,225
Boxes, wooden packing.....	6	27,590	43			14,053	34,550	61,812
Brass castings.....	7	40,600	37		4	18,900	36,373	71,400
Bread and other bakery products.....	59	352,550	238	43	27	125,805	605,993	924,420
Brick and tile.....	9	161,495	226		70	100,750	45,270	201,040
Brooms and brushes.....	3	13,700	16	7	4	3,796	23,379	43,892
Carpentering.....	15	45,600	120			56,780	127,275	224,100
Carriages and sleds, children's.....	3	47,800	29	4		14,000	37,500	75,400
Carriages and wagons (see also Wheelwrighting).....	23	205,900	281		7	143,221	184,081	410,631
Clothing, men's.....	52	1,090,900	649	853	11	576,425	1,798,067	2,747,475
Coffee and spices, roasted and ground.....	5	120,300	22	4	3	11,706	187,000	230,500
Confectionery.....	10	173,700	121	75	17	77,770	262,680	433,800
Cooperage.....	17	251,857	315		26	130,340	232,245	432,162
Cutlery and edge tools (see also Hardware).....	6	98,400	33		14	46,039	50,900	115,100
Dentistry, mechanical.....	7	5,375	6		2	3,635	6,800	22,500
Drugs and chemicals (see also Baking and yeast powders; Patent medicines and compounds).....	5	314,600	54	14	1	25,000	137,635	204,900
Dyeing and cleaning.....	4	31,350	12	14	1	4,090	3,230	12,500
Engraving, steel.....	4	4,100	4			2,850	1,100	7,500
Engraving, wood.....	5	6,600	10			16,100	1,325	30,550
Files.....	5	12,400	32		1	13,625	6,000	20,500
Flouring and grist-mill products.....	7	940,000	120			53,934	2,081,532	2,251,348
Foundry and machine-shop products.....	41	3,080,918	2,011		162	936,543	1,935,038	3,577,029
Furniture (see also Mattresses and spring beds; Upholstering).....	33	578,200	371	15	52	218,549	370,065	773,031

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.			
Furs, dressed	5	\$85,000	19	37	3	\$14,378	\$86,500	\$136,750
Glucose.....	3	1,750,000	775	5	17	485,000	2,000,000	3,075,000
Hardware (see also Cutlery and edge tools).....	9	280,000	223	3	41	106,025	174,844	382,003
Hats and caps, not including wool hats	6	17,950	12	11	2	6,150	17,050	30,200
Iron and steel	4	1,700,000	688	.....	25	212,278	685,353	887,012
Iron forgings	3	255,000	180	.....	5	69,000	225,000	400,000
Leather, curried	3	93,000	64	.....	2	26,233	430,250	510,500
Leather, tanned.....	7	1,077,000	375	.....	2	140,442	1,446,300	1,757,600
Liquors, malt	28	1,859,975	360	.....	.....	179,962	916,171	1,636,020
Lithographing (see also Printing and publishing).....	4	100,000	128	6	9	99,400	185,910	331,800
Lock and gun-smithing.....	4	4,500	7	.....	.....	4,050	10,850	20,500
Looking-glass and picture frames.....	8	39,700	40	3	8	13,205	45,730	86,700
Lumber, planed (see also Wood, turned and carved).....	17	1,133,000	561	.....	59	243,820	734,541	1,210,406
Malt	34	1,342,000	275	.....	.....	91,840	1,512,752	2,002,893
Marble and stone work	21	274,050	477	7	2	189,649	132,820	433,023
Masonry, brick and stone.....	16	27,250	123	.....	6	47,700	50,250	144,350
Mattresses and spring-beds (see also Furniture).....	7	19,098	10	3	3	6,074	31,945	64,032
Musical instruments, pianos and materials	3	40,000	44	.....	.....	22,450	13,114	42,079
Painting and paperhanging.....	29	40,157	175	.....	6	98,070	110,135	238,438
Patent medicines and compounds (see also Drugs and chemicals).....	12	1,098,100	78	47	2	60,471	261,345	654,027
Photographing.....	21	46,500	28	4	7	15,338	13,275	64,300
Plumbing and gasfitting	17	99,300	152	.....	16	77,390	151,500	238,200
Printing and publishing (see also Lithographing).....	31	319,000	424	80	97	261,303	372,318	975,022
Pumps, not including steam pumps.....	4	13,000	19	.....	.....	9,375	7,850	25,200
Refrigerators	4	125,000	212	13	25	88,700	113,500	264,500
Roofing and roofing materials.....	5	19,321	38	.....	.....	13,951	36,791	62,728
Saddlery and harness	31	37,344	93	.....	2	41,433	30,498	105,344
Shipbuilding.....	17	576,560	709	.....	.....	323,390	455,252	859,766
Shirts.....	7	20,300	10	61	2	21,760	24,300	60,500
Slaughtering and meat-packing, not including retail butchering.....	6	372,500	239	.....	.....	170,433	3,023,924	3,441,280
Soap and candles	7	579,000	153	4	43	81,095	831,114	1,176,340
Starch	3	245,000	134	40	15	77,091	373,176	625,300
Stereotyping and electrotyping	3	39,000	30	.....	1	26,400	9,600	58,000
Stone and earthen-ware	3	8,500	10	.....	.....	4,675	2,275	17,800
Tinware, copperware, and sheet-iron ware	53	203,050	213	.....	21	115,417	269,470	492,317
Tobacco, cigars and cigarettes.....	40	196,929	250	11	41	114,470	241,758	404,946
Trunks and valises	6	33,000	43	.....	1	16,596	43,500	70,800
Upholstering (see also Furniture).....	6	4,450	5	.....	1	1,900	3,200	15,600
Vinegar.....	6	52,100	13	.....	.....	9,342	53,403	84,200
Watch and clock repairing	16	13,000	25	.....	3	14,533	10,493	42,099
Wheelwrighting (see also Blacksmithing; Carriages and wagons).....	35	33,325	72	.....	4	31,795	33,354	107,603
Wirework.....	5	119,300	93	10	42	55,305	114,614	203,500
Wood, turned and carved (see also Lumber, planed).....	5	46,000	36	6	19	35,910	56,630	115,526
All other industries (a)	31	2,264,332	1,490	214	175	643,535	2,663,731	4,023,591

a Embracing artificial limbs; awnings and tents; baskets, rattan and willow ware; bluing; boot and shoe findings; boot and shoe uppers; boxes, cigar; bridges; carriage and wagon materials; cars, railroad, street, and repairs; coffins, burial cases, and undertakers' goods; cordage and twine; dentists' materials; drain and sewer pipe; electrical apparatus and supplies; electroplating; envelopes; fertilizers; flavoring extracts; fruits and vegetables, canned and preserved; furniture; chairs; glass, cut, stained, and ornamented; gloves and mittens; glue; gold and silver leaf and foil; gold and silver, reduced and refined; grease and tallow; hairwork; housefurnishing goods; ink; iron bolts, nuts, washers, and rivets; iron pipe, wrought; iron railing, wrought; iron work, architectural and ornamental; jewelry; laths; lead, bar, pipe, sheet, and shot; liquors, distilled; lumber, sawed; mantles, slate, marble, and marbleized; millinery and lace goods; models and patterns; musical instruments, organs and materials; oil, linseed; oil, lubricating; paints; paperhangings; paving materials; perfumery and cosmetics; scales and balances; show-cases; silversmithing; springs, steel, car, and carriage; stamped ware; stencils and brands; toys and games; type founding; umbrellas and canes; whips; and window blinds and shades.

From the foregoing table it appears that the average capital of all establishments is \$22,694 79; that the average wages of all hands employed is \$412 97 per annum; that the average outlay in wages, in materials, and in interest (at 6 per cent.) on capital employed is \$30,942 53.

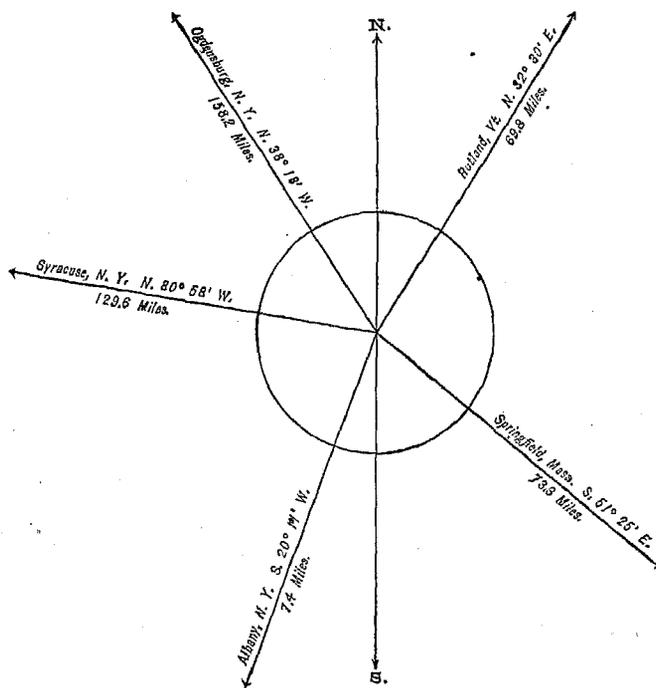
COHOES,

ALBANY COUNTY, NEW YORK.

POPULATION

IN THE
AGGREGATE,
1850-1880.

Year	Inhab.
1790.....	.....
1800.....	.....
1810.....	.....
1820.....	.....
1830.....	.....
1840.....	.....
1850.....	4,229
1860.....	8,800
1870.....	15,357
1880.....	19,416



POPULATION

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

Male	8,701
Female	10,715
Native	11,844
Foreign-born	7,572
White	19,409
Colored	7

Latitude: 42° 46' North; Longitude: 73° 42' (west from Greenwich); Altitude: 20 to 140 feet. (a)

FINANCIAL CONDITION:

Total Valuation: \$5,341,100; per capita: \$275 00. Net Indebtedness: \$141,214; per capita: \$7 27. Tax per \$100: \$2 52.

HISTORICAL SKETCH.

Previous to the incorporation of the Cohoes Water Power Company in 1826, the place now occupied by the city of Cohoes was but a small hamlet. Its situation is very advantageous for manufacturing purposes, and as early as 1811 an unsuccessful attempt had been made to establish cotton, iron, and lime manufactories. The progress of the place was slow, and in 1830 it contained but 150 inhabitants. At that time there was neither post-office, church, tavern, nor store within its limits. In 1831 a flour-mill was built. In 1832 the manufacture of woolen knit goods was begun, and in 1834 that of axes and edge-tools. In 1836 the Harmony cotton-mills were incorporated.

a Above tide-water at Troy.

But the general progress of Cohoes was slow until 1846-'47, when a more rapid growth set in and the place began to develop. In 1848 Cohoes was incorporated as a village, and since that time its growth has been steady and rapid. In 1869 it was incorporated as a city. No very extensive fires have occurred. The population is composed very largely of foreigners, Americans, Canadian-French, and Irish predominating in about equal numbers, with a fair sprinkling of Germans.

COHOES IN 1880.

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

LOCATION.

The city lies in latitude $42^{\circ} 46'$ north, longitude $73^{\circ} 42'$ west from Greenwich, on the right bank of the Mohawk river, at its junction with the Hudson, a little below Cohoes falls, and on the Erie canal near its junction with the Champlain canal, 8 or 9 miles north of Albany. The river here is not navigable. The altitude of the city, above tide-water at Troy averages 80 feet, the lowest point being 20 and the highest 140 feet.

RAILROAD COMMUNICATIONS.

Cohoes is on the Troy and Schenectady branch of the New York Central and Hudson River railroad, and on the Albany and Saratoga branch of the Delaware and Hudson Canal railroad.

TRIBUTARY COUNTRY.

The country immediately tributary to Cohoes is generally devoted to farming and the raising of supplies for the domestic trade.

TOPOGRAPHY.

The soil of the site of the city is a clay loam resting upon a very thick mass of North River shale. This shale outcrops in many parts of the city, and has been bored to the depth of 2,300 feet without passing through it. The surface varies considerably in level. There are no ponds or marshes near the city. The country within a radius of 5 miles is rather open, with but little wood.

CLIMATE.

Highest recorded summer temperature, 98° ; highest summer temperature in average years, 86° . Lowest recorded winter temperature, -20° ; lowest winter temperature in average years, -12° . The climate is not much affected by adjacent waters or by elevated lands. Southerly winds produce rain, northerly winds produce cold, and the westerly, the prevailing wind, accompanies fair weather. Winds seldom blow from the east, and, when they do, generally bring rain-storms.

STREETS.

The total length of streets is 42 miles, and of these, $1\frac{3}{4}$ mile is paved with stone blocks, $2\frac{3}{4}$ miles with broken stone, one-third of a mile with wood, and $1\frac{1}{4}$ mile with gravel. The cost per square yard, as nearly as can be estimated, is, for wood, \$3 40, and for stone blocks, \$2 50. The stone-block pavement is considered the most economical. Sidewalks are paved with flagging and with asphalt. Gutters are laid with flag- and cobble-stones. About one-third of the streets have trees planted along the sides at the curb. Street repairs are made by the superintendent of streets, and the cost, including his salary, is about \$3,500 per annum. Experience here indicates a preference for day work, especially as the superintendent has a force of men in his employ for cleaning streets. No stone-crusher or roller is used. There is a horse-railroad, with a length of $3\frac{1}{4}$ miles, in the city. There are 7 cars and 64 horses used, and 33 men are employed. The average number of passengers carried daily is 1,200, at rates of fare of 5, 8, and 10 cents, according to distance. There are no omnibus lines in the city.

WATER-WORKS.

The water-works are owned by the city, and their total cost is \$160,000. The pumping system is used, and the pressure in the mains varies from 20 to 70 pounds to the square inch, according to localities. The average amount pumped per diem is 1,250,000 gallons. The pump—an ordinary piston-pump—is driven by water-power, no steam being used. The cost of raising 1,000,000 gallons 1 foot high is 20 cents. The yearly cost of maintenance, aside from the cost of pumping, is \$16,000, and the yearly income from water-rates is \$21,000. A few water-meters are used.

GAS.

The gas-works are owned by a private corporation. The charge to consumers is \$3 25 per 1,000 feet. The city pays \$23 50 per annum each for street-lamps, 75 in number.

PUBLIC BUILDINGS.

All of the buildings occupied by the city for municipal purposes, wholly or in part, are rented.

PUBLIC PARKS AND PLEASURE-GROUNDS.

There are no public parks or pleasure-grounds in Cohoes.

PLACES OF AMUSEMENT.

There are no theaters in the city. There is one general hall used for lectures, concerts, balls, etc., with a seating capacity of about 900. There are no concert- or beer-gardens.

DRAINAGE.

There is no regular system of sewerage, the sewers being built according to the requirements of each case as it comes up. The outlets of the sewers are generally below the surface of the Hudson river, into which they discharge. Deposits are removed by hand and by flushing. This work is done by the superintendent of streets in the ordinary course of repairs and in connection with other work, and no estimate of the cost can be given; it is said to be inconsiderable. The whole cost of construction is assessed per front foot, except in the case of trunk sewers, of which the cost is assessed according to benefit.

CEMETERIES.

There are connected with the city one public and one private cemetery. The former is situated in the western division of the city, three-quarters of a mile from the center; the latter is the property of the Roman Catholic church, and is situated in the southerly division, about three-quarters of a mile from the center of the city. There are and have been no church-yard interments. The number of interments in the public cemetery could not be ascertained. In the Catholic cemetery it is estimated that upward of 5,000 burials have been made, and in some places the bodies are said to lie two deep. Burial permits are not required in the public cemetery, but for removals through the city a permit is required. Graves must be 6 feet deep, and this seems to be the only regulation regarding interments. The charge for single interments in the Catholic cemetery is \$2. In this cemetery, lots are taken care of by the curator, to whom their owners pay a small sum for the service. There are no special regulations, and, within certain bounds, each owner does as he sees fit with his lot. As the matter of revenue is entirely in the hands of the pastor, it could not be learned. Mayor Thorn appends the following to the schedule on this subject:

Very many of the protestant interments from this city are made in the Albany Rural, in the Troy Oakwood, and in the Waterford cemeteries. We have no decent place in this city for interments, and as our neighbors have provided excellent and beautiful ones we borrow from them to a very large extent.

MARKETS.

Cohoes has no public or corporation markets. The distribution of meats, poultry, fish, vegetables, etc., is done wholly by private enterprise.

SANITARY AUTHORITY—BOARD OF HEALTH.

The chief sanitary authority of Cohoes is vested in a board of health, an independent organization, composed of 4 members—the mayor, city clerk, and 2 aldermen—with a physician as health officer of the board, who is appointed annually by the common council. The annual expense of the board, when there is no declared epidemic, is about \$1,200, for salary of health officer, printing, etc. During an epidemic the board may increase its expenses to whatever extent may be necessary to provide quarantine for persons afflicted with the disease, and for the care, medical or otherwise, of the sick poor. In the absence of an epidemic its authority extends to the suppression and removal of nuisances, and to whatever may be necessary for the preservation of the public health. During an epidemic it has the full powers granted to boards of health by the state law of April 10, 1850. The executive officer of the board is the health officer. He reports monthly upon the sanitary condition of the city, specifies points which he thinks need attention, and recommends the best course of action. He also executes all orders of the board. The health officer is the one upon whom the health interests of the city are chiefly dependent. He is not a member of the board, and has no vote. The business of the board is based largely upon the reports of the health officer, through whom it orders whatever action it deems best. The regular meetings are on the first Monday of each month.

There are no assistant health officers, but all policemen are empowered to act as inspectors, to report nuisances, and to enforce the ordinances and regulations of the board. Annual inspections are made in June, and also whenever nuisances are reported. When nuisances are reported the parties responsible are ordered to remove or abate the same; if this is not done at once the board does it and the cost of the work is assessed upon the property. The inspectors are required to note all defective house-drainage, privy-vaults, cesspools, and sources of drinking-water, and report the same to the board, which corrects the same so far as it can be done. The same plan is pursued toward defective sewerage and street-cleaning. The board exercises full control over the conservation and removal of garbage. The board has no regulations concerning the burial of the dead, except in cases of small-pox, when interments must be made between 9 p. m. and 6 a. m. The pollution of streams is forbidden by ordinance. Excrement can be removed only at night and under the superintendence of the police.

INFECTIOUS DISEASES.

Small-pox patients are isolated, sometimes by being sent to the pest-house (the county pest-house is used), and sometimes by being quarantined at home. Scarlet-fever patients are not isolated. In case of the breaking out of a contagious disease in the public or private schools the board may close the same, or compel children from affected families to remain away. Vaccination is compulsory only for children attending the public schools, and this is done at the public expense.

There is no system for the registration of births. Deaths are recorded by the undertakers and reported to the health officer, who makes an annual report of mortality to the board, which transmits the same to the city council.

MUNICIPAL CLEANSING.

Street-cleaning.—The streets are cleaned both by the city and by the abutters, but mainly by the city with its regular force. The work is done wholly by hand, no sweeping-machines being used. The principal streets are cleaned once a week, and it is reported as being efficiently done. The cost of the work is slight. The sweepings are deposited on vacant lots outside the city.

Removal of garbage and ashes.—Garbage is removed by the city, the work being done under contract. It is required to be kept in vessels and placed convenient for removal twice a week in summer and once a week in winter. It is allowed to keep ashes and garbage in the same vessel. The final disposal of garbage is by feeding it to hogs. The cost of removal to the city is \$85 per month. So far as known, no injury to health has resulted from the system.

Dead animals.—The removal and burial of dead animals is a part of the duty of the garbage-contractor, and the cost of the same is included in his contract price. The number of carcasses removed is small, being probably not over 20 per annum. The system is reported to work well.

Liquid household wastes.—Chamber-slops are generally thrown into privy-vaults, except where there is connection with the sewers. Nearly all of the liquid household wastes of the city are delivered into sewers; considerable is run into the street-gutters and very little into cesspools. The cesspools are lined with stone, without mortar, and are freely porous. They are unprovided with overflows, and when full are covered with fresh earth and another one is dug. Street-gutters, into which household wastes are run, are flushed during dry periods. In a few instances the cesspools receive the wastes from water-closets. It is reported that no contamination of drinking-water results from the overflow or underground escape of the contents of vaults and cesspools. Cesspools can be cleaned out only at night.

Human excreta.—It is estimated that about 5 per cent. of the houses in the city have water-closets, nearly all of which deliver into the sewers, and the remainder depend on privy-vaults. The privy-vaults are the object of the scrutiny of the health officer. They are cleaned only at night, between the hours of 11 p. m. and 4 a. m., and the night-soil is taken out of the city and buried, none of it being allowed on land within the gathering-ground of the public water-supply.

Manufacturing wastes.—All manufacturing wastes are run into the sewers and power canals.

POLICE.

The police force is appointed by the board of police commissioners, and is under their sole direction. The chief of police is the executive officer, and he has entire immediate control of the force, under the orders of the board; his salary is \$1,000 per annum. The remainder of the force and their respective salaries are as follows: 1 sergeant, at \$900 a year; 1 special court officer and detective, at \$600 a year; 1 special watch, at \$1 per day; 1 jail physician, at \$100 a year; 1 jailer, at \$500 a year; and 10 patrolmen, at \$800 a year each. The uniform is of blue cloth, with stiff-front cap to match clothing, in winter; and blue flannel, with sack blouse and dark straw hat, in summer. The men provide their own uniforms. The patrolmen are armed with clubs and revolvers. The tours of duty are 12 hours each, and the men have one day off each week.

During the past year the total number of arrests made by the force was 737, the principal causes being drunkenness, breach of the peace, larceny, and violations of the excise law. In their final disposition, 367 paid fines,

85 went to the penitentiary, 2 to the insane asylum, 128 were discharged, etc. The amount of property lost or stolen and reported to the police, during the year, was very small. The number of station-house lodgers for the year was 229, as against 220 in 1879. The force co-operates with the fire department by attending fires, preserving order, and preventing thefts, and with the health department by acting as inspectors and reporting nuisances. Special policemen are appointed by the commissioners, mostly upon private requests, but at no expense to the city. At elections special policemen are also appointed who serve for the day only. During the past year there were no casualties in the force, and only 65 days were lost through sickness. The yearly cost of the police force (1880) is \$13,598.

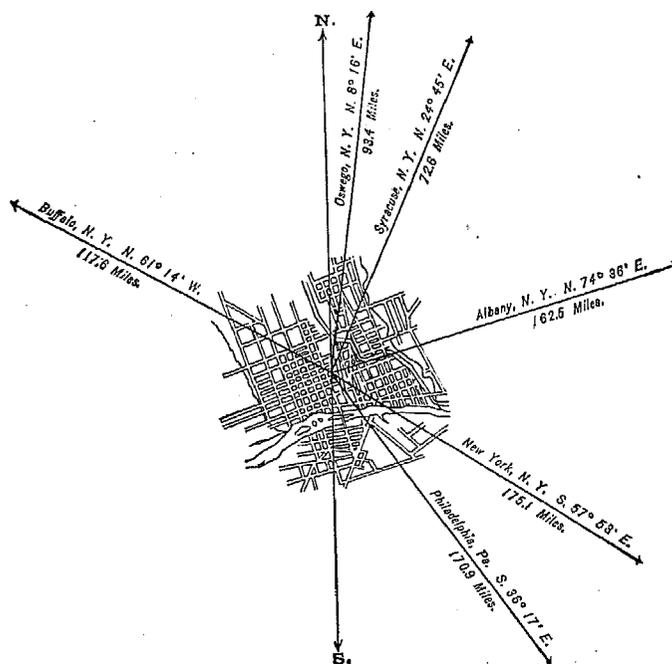
ELMIRA,

CHEMUNG COUNTY, NEW YORK.

POPULATION

IN THE
AGGREGATE,
1850-1880.

Year	Inhab.
1790	.....
1800	.....
1810	.....
1820	.....
1830	.....
1840	.....
1850	8,166
1860	8,682
1870	15,863
1880	20,541



POPULATION

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

Male	9,749
Female	10,792
—	
Native	16,967
Foreign-born	3,574
—	
White	19,835
Colored	* 706

* Including 4 Indians.

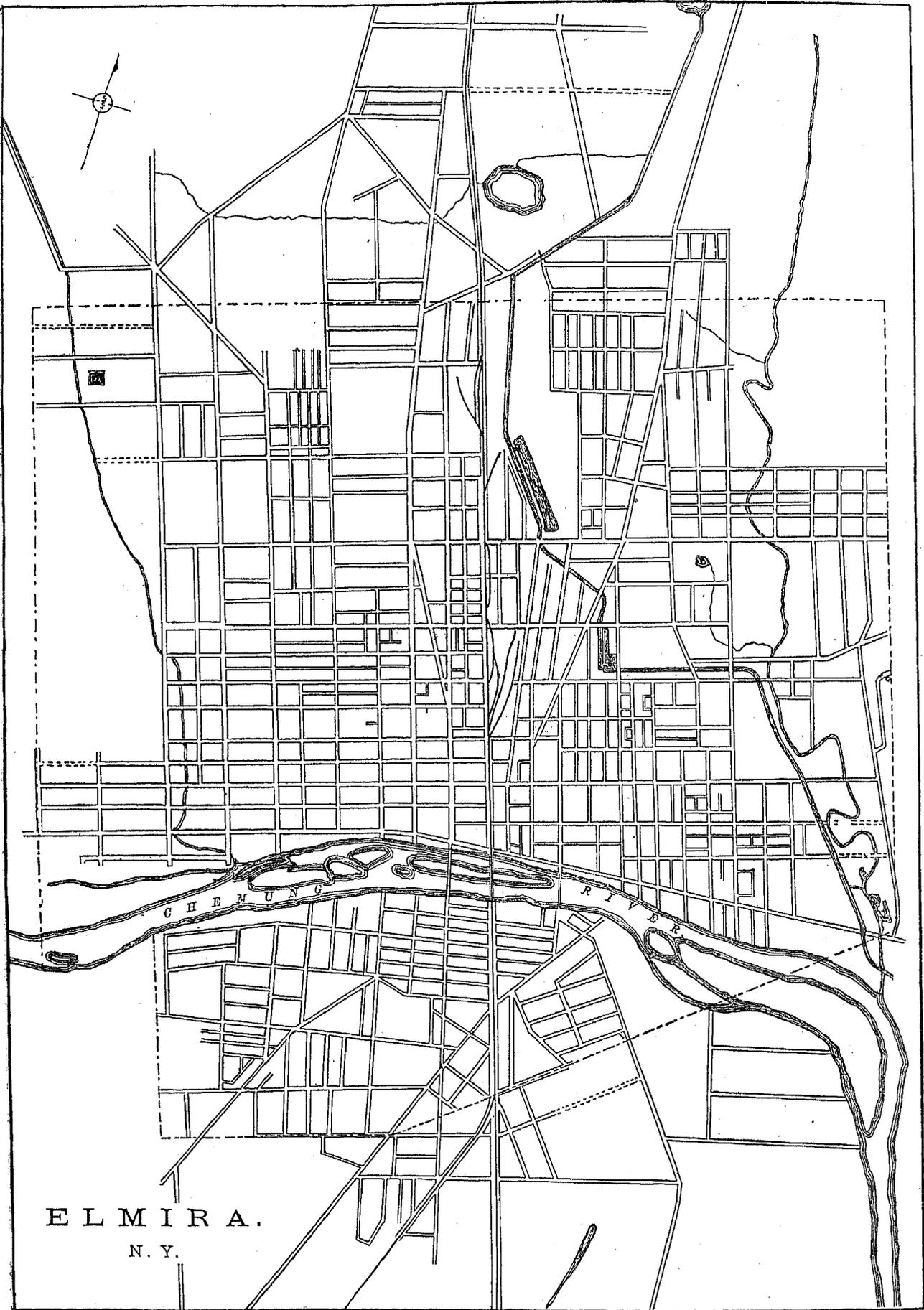
Latitude: 42° 5' North; Longitude: 76° 50' (west from Greenwich); Altitude: 864 feet.

FINANCIAL CONDITION:

Total Valuation: \$10,797,029; per capita: \$526 00. Net Indebtedness: \$270,400; per capita: \$13 16. Tax per \$100: \$1 93.

HISTORICAL SKETCH.(a)

The first settlement of Elmira was made in 1786, and the settlers planted their first field of corn in 1788. The original name of the place was "Newtown" or "Newtown Point", and this name was changed to Elmira in 1828. In 1864 it was granted a city charter, and at the present time it consists of seven wards. The growth of the city has been progressive, the war of the rebellion bringing it into prominence as a distributing camp, and adding materially to its population and prosperity. Immense barracks were erected here (they have since been removed), and it was also the site of a military prison, where many confederate prisoners were confined. In 1866 one-half of the business portion of the city was destroyed by fire, but was immediately rebuilt with substantial brick buildings. The periods of depression are unimportant, the growth having been a progressive and healthy one. The early settlers were from New England, and some from New York, New Jersey, and Pennsylvania. The present population is composed of various nationalities, but no particular state or nationality has supplanted those previously established. The industries of the city are largely manufacturing.



ELMIRA.
N. Y.

ELMIRA IN 1880.

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

LOCATION.

Elmira lies in latitude 42° 5' north, longitude 76° 50' west from Greenwich, on the Chemung river, a tributary of the Susquehanna, and a little north of the Pennsylvania state line. The river on which it is situated is not navigable. The altitude of the city is 864 feet above sea-level.

RAILROAD COMMUNICATIONS.

Elmira is touched by 5 railroads, as follows:

The New York, Lake Erie, and Western railroad (formerly the Erie railway), between New York and Buffalo.

The Northern Central railroad, from Baltimore, Maryland, to Canandaigua.

The Lehigh Valley railroad, to New York.

The Utica, Ithaca, and Elmira railroad, to Canastota.

The State Line railroad.

TRIBUTARY COUNTRY.

The country immediately tributary to Elmira is largely agricultural, with large grain and dairy interests. The city is also the base of supply for a portion of the Blossburg bituminous coal region of Pennsylvania. There are several stone quarries outside of the city. In addition to the extensive trade enjoyed by the city with the surrounding country there are several manufactories, including the large shop of the Pullman Car Company, and the workshops of the New York, Lake Erie, and Western, and the Northern Central Railroad Companies.

TOPOGRAPHY.

The soil is alluvium overlying drift—gravelly loam—with underlying rock, at the depth of about 90 feet, of Chemung sandstone and shale, belonging to the Chemung group of the Devonian period. The site of the city is in a denuded valley 864 feet above sea-level, with a plateau of country surrounding it having an elevation of 500 to 600 feet above the city level. Within 5 miles of the city there are several small peat swamps, but they are unimportant and are fast drying up. There is one pond, called Eldridge lake, near the city, of clear water, and about 1 mile in circumference.

CLIMATE.

The record of the thermometer at Elmira was not reported. The mean temperature in summer, taken from the record of the Smithsonian Institution, is 64.97°; in winter, 26.34°, and during the year, 45.46°.

STREETS.

Total length, 75 miles. Of these, 2½ miles are paved with wood, the original cost of which was \$3 per square yard, but it is now being torn up and replaced with stone blocks that cost \$1 62½ per square yard. The sidewalks are of brick, wood, asphaltum, and stone flags. The gutters are of flag- and cobble-stones, while in some portions of the city a shallow trench answers for a gutter. Nearly all the streets have trees planted in regular order between the plank and the curb. They are chiefly maple and elm, and the manner of planting is left to the discretion of the abutters. Repairs on streets are done by day work, and the annual appropriation for this purpose (1880) is \$12,450. A steam stone-crusher has just been purchased. There is one street-railroad in the city with a total length of 9½ miles, using 14 cars and 28 horses, and employing 13 men. There were 203,468 passengers carried during the year, and the rates of fare are 5, 10, and 15 cents. There are no omnibus lines.

WATER-WORKS.

The works for the water-supply are owned and operated by a private corporation. Their total cost was \$329,841 73. The chief supply is by gravitation, with pumping into a reservoir part of the year to make up any deficiency. The pressure in the mains varies from 20 to 28 pounds to the square inch. The greatest amount of water pumped per diem is 2,000,000 gallons, and the least 1,000,000 gallons. The yearly cost of maintenance, aside from cost of pumping, is \$4,825 31, and the yearly income from water-rates, \$27,894 32. Water-meters are used, but only very few.

GAS.

Gas is supplied by a private corporation to general consumers at \$2 70 per thousand, and to the city at \$2 45 per thousand. There are 165 street-lamps.

PUBLIC BUILDINGS.

The city owns and occupies for municipal uses, wholly or in part, 1 city hall and 1 hospital. The former was an old abandoned court-house that was purchased many years ago from the county and moved to its present site, while the latter was originally the county jail.

PUBLIC PARKS AND PLEASURE-GROUNDS.

Eldridge Park, situated in the northerly part of the city, with an area of 1 acre, is the only park in Elmira. The land was deeded to the city, and the park is controlled by the common council.

PLACES OF AMUSEMENT.

There are 2 theaters in the city: the opera-house, with a seating capacity of 1,475, and the Academy of Music, with a seating capacity of 1,000. The buildings pay no license, but all exhibitions pay a license, varying from \$2 to \$30 each. The total sum received by the city from this source during the past year was \$168. There are no concert- or lecture-halls in the city.

DRAINAGE.

The sewerage-works of Elmira prior to 1880 consisted of only a few public sewers regulated according to the local requirements of each case, and discharging into the Chemung river. In some cases the outfalls are submerged, and in others above water and fully exposed. The rise of the river in times of freshet is sometimes as much as 18 feet above its ordinary level. It is reported that no artificial flushing has been done, and that deposits have been removed only from the catch-basins, for which the cost is not known. The cost of sewerage works has been paid by the city from public funds raised within the ward where each improvement is made. The cost of each inlet-basin is about \$40, and of each manhole of average depth about \$50. No further information is furnished beyond the fact that the city is about to adopt a system of sewerage (*a*) providing for a flow of $5\frac{1}{4}$ cubic feet per minute per acre.

CEMETERIES.

There are 5 cemeteries in or partly in the city:

Woodlawn Cemetery, area 98 acres, is situated between Walnut and Davis streets, on the northern limits of the city.

Second Street Cemetery, area 4 acres, is situated between Second, Third, and Columbia streets and College avenue.

Jewish and Southport Cemeteries, with a combined area of $3\frac{1}{2}$ acres, are situated on Fulton street, near the southern limits of the city.

Saints Peter and Paul Cemetery, area 10 acres, is situated at the extreme southwestern corner of the city, and partly outside the limits.

The first two of the above are owned by the city and the others by private corporations. There have been about 7,000 interments in Woodlawn cemetery from the city, but the number in the other cemeteries could not be learned. During the past year the number of burials in the several cemeteries was as follows: Woodlawn, 242; Saints Peter and Paul, 107; Southport, 21; and Second Street, 16. Burial permits are issued on the certificates of the attending physician, and all graves must be 5 feet deep. The city cemeteries are under the control and management of the commissioners of cemeteries, and other cemeteries are under charge of the corporations to which they belong.

MARKETS.

There are no public or corporation markets in the city.

SANITARY AUTHORITY—BOARD OF HEALTH.

Under the revised city charter of Elmira, the common council constitutes the board of health, with the mayor as chairman and the city clerk as secretary of the board. The members receive no compensation for this duty. The expenses of the board, in ordinary times, are \$800 annually for salaries, and during an epidemic any increase of expense deemed necessary is met by additional taxation. In absence of an epidemic the board has authority to abate nuisances and to do all things necessary to protect the lives and health of the citizens, so far as cleanliness, ventilation, and purification are concerned. During an epidemic the board can erect hospitals, establish quarantine, and carry out such other measures as in its judgment may be necessary to overcome or limit the disease. The health officer, salary \$400 per annum, is the chief executive officer. He is appointed annually by the common council, and must be a physician. His duties are to suggest sanitary reforms, abate nuisances, and see that the

^a This system of sewerage was adopted by the city council October 17, 1881, and the city, by act of the state legislature, was authorized to issue bonds for the purpose of paying the cost for an amount not to exceed \$100,000 in all, and not more than \$20,000 in any one year.

rules and regulations of the board are carried out. Two assistant health officers, at salaries of \$200 per annum each, are employed. Neither the health officer nor his assistants have police powers, but they can at any time call on the regular policemen for assistance in the execution of their duty. Inspections are made only as nuisances are reported. When nuisances are reported they are inspected, and, if found to exist or to be detrimental to the public health, they are ordered abated. Defective house-drainage, privy-vaults, cesspools, and sources of drinking-water are noticed only when reported as nuisances. Defective sewerage is corrected only when the city is threatened with a lawsuit for damages resulting to the adjoining property. Street-cleaning is under the control of the city. The board does not exercise much control over the conservation and removal of garbage. Interments are not allowed in the cemeteries without the attending physician's certificate as to cause of death.

INFECTIOUS DISEASES.

In some instances small-pox patients are quarantined at home, and in others they are removed to the pest-house situated about a mile and a half from the city limits. Scarlet-fever patients are quarantined at home. The board has not as yet taken cognizance of the breaking out of contagious diseases in public or private schools. The board of education excludes from the public schools children from families in which there is known to be a contagious disease, and re-admits them only upon a physician's certificate. Vaccination is compulsory only as regards school-children, and is done at the public expense only in the case of indigent pupils. Physicians are required to report to the board all cases of contagious disease coming under their notice. All births and deaths are reported to the city clerk, who keeps the records. There is no system of registration for diseases.

REPORTS.

The board makes no reports. Its proceedings are published in the daily papers. H. D. Wey, esq., who communicated the foregoing information regarding sanitary matters, says:

The board of health, to be effective, should be removed from politics. The common council is largely a political body, consequently the medical profession is not in sympathy.

MUNICIPAL CLEANSING.

Street-cleaning.—The streets are cleaned both by the city and by private abutters. The latter collect the dirt and the former removes it. The work is done entirely by hand, no sweeping-machines being used. The paved streets are cleaned once a week, and the others, save raking the stones, once a year. The sweepings are used to fill up low ground and also for garden fertilizer. The cost is not stated. It is reported that some streets are neglected and they become receptacles for ashes, and frequently for garbage, the ordinance against throwing these substances into the streets not being enforced.

Removal of garbage and ashes.—The city ordinances provide for the removal of all garbage and house-offal by persons regularly licensed for the purpose, unless the householders prefer to remove it themselves. The garbage is required to be kept in suitable vessels and put out on the sidewalks when called for. It is forbidden to keep garbage and ashes in the same vessel. The ordinances, it is reported, are not enforced. The garbage is either fed to pigs or chickens, or thrown in the ash-pile, and the ashes are used for filling up sunken lots. In some instances the garbage is thrown out on the ground.

Dead animals.—The carcass of any animal dying within the city limits is removed by the owner and buried at his own expense.

Liquid household wastes.—Chamber-slops and kitchen and laundry wastes are run into the sewers, or, where sewers do not exist, into cesspools, none being allowed to pass into the street-gutters. The cesspools are porous, are not provided with overflows, receive the wastes from water-closets, and are cleaned by the owners when full. It is reported that cases of typhoid fever have frequently been traced to the contamination of wells from the overflowing or underground escape of the contents of privy-vaults and cesspools.

Human excreta.—About one-fortieth of the houses in the city are provided with water-closets—one-half delivering into the sewers and one-half into cesspools—and the remainder depend on privy-vaults. The vaults are required to be 4 feet deep. None of them are water-tight. They are required to be cleaned by licensed scavengers between the hours of 11 p. m. and 3 a. m. from April 1 to November 1, and the night-soil is used as a fertilizer. It is reported that this work is very imperfectly done and that the contents from the vaults are often scattered along the road during removal. The water-supply is taken from the river, and the company would probably resist the placing of night-soil along the banks.

Manufacturing wastes.—The liquid refuse from the tanneries is run into the river.

POLICE.

The police force is appointed and governed by the board of police commissioners. The board consists of 4 members, appointed by the city council, with the mayor as presiding officer, but without a vote. The executive

officer is the chief of police, with a salary of \$1,200 a year, and he has general supervision of the force. There are 1 captain, salary \$960 a year; 16 patrolmen, at \$720 a year each; and 2 constables, at \$660 a year each. The uniform is of dark-blue cloth with brass buttons. A complete suit costs \$75, and each man furnishes his own. Each patrolman carries a club. The tours of duty are 12 hours each, and the total length of streets patrolled by the force is 10 miles. During the past year the police made 1,102 arrests, the principal cause being intoxication. In most cases, fines from \$5 to \$28, or imprisonment from 5 to 60 days, were imposed. The total amount of property lost or stolen and reported to the police was \$500, and of this \$250 was recovered. There were 200 station-house lodgers during the year, as against 300 in 1879. The police force co-operates with the fire department in preserving order and preventing thefts at fires. One special policeman is appointed to attend calls by telephone during the night. The yearly cost of the police force (1880) is \$13,560.

FIRE DEPARTMENT.

The annual report of the chief engineer for the year ending January 31, 1879, shows the force of the department to consist of 1 chief engineer, salary \$300 a year; 1 assistant engineer, at \$150 a year; 3 foremen, at \$150 a year each; 2 steamer drivers, at \$600 a year each; 2 hose-cart drivers, at \$480 a year each; 2 engineers, at \$500 a year each; 1 tower-keeper, at \$600 a year; 15 firemen, at \$100 a year each; and 1 driver of hook-and-ladder truck, at \$2 for each fire—total force, 28. The apparatus in use consists of 4 steam fire-engines, 2 hose-carts, and 1 hook-and-ladder truck. There is 5,700 feet of hose in the department, 2,800 feet being good, 1,400 feet poor, and 1,500 feet condemned. There are 6 horses in use. Water is taken from 131 hydrants—126 public and 5 private. The fire-alarm telegraph has 55 signal-boxes—20 public and 35 private.

The annual report of the city chamberlain for the past year shows the total expenditures for the fire department to have been \$18,838 69. Of this, \$6,125 was for water.

MANUFACTURES.

The following is a summary of the statistics of manufactures of Elmira for 1880, being taken from tables prepared for the Tenth Census by E. B. Pickering, special agent:

Mechanical and manufacturing industries.	No. of estab-lish-ments.	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	263	\$2,698,762	2,283	324	121	\$1,024,161	\$3,132,115	\$4,877,300
Blacksmithing (see also Wheelwrighting)	14	20,400	19			7,470	63,317	24,895
Boots and shoes, including custom work and repairing	25	364,625	396	75	16	205,857	469,191	760,425
Bread and other bakery products	6	5,200	6	2	1	3,525	12,700	20,000
Carpentering	30	20,050	92		2	41,561	70,600	135,047
Carriages and wagons (see also Wheelwrighting)	6	162,300	50			20,060	40,800	86,200
Clothing, men's	8	135,000	82	127	3	63,670	170,212	260,250
Cooperage	5	5,800	11			4,197	4,925	11,900
Flouring- and grist-mill products	5	52,000	10			8,414	105,790	124,710
Foundry and machine-shop products	3	46,500	31		1	12,391	27,245	52,365
Furniture	4	98,000	68	2	3	37,140	63,200	167,000
Leather, tanned	4	205,000	69			25,900	450,852	540,600
Liquors, malt	3	130,922	18			7,664	38,959	69,506
Lumber, planed	6	170,000	39			13,312	170,000	207,900
Marble and stone work	0	81,150	52	2		21,393	52,613	95,998
Masonry, brick and stone	10	8,500	86			42,700	49,218	113,169
Painting and paperhanging	22	16,375	76		2	25,692	27,840	73,750
Photographing	6	17,800	3	2	2	2,318	3,903	13,739
Plumbing and gasfitting	4	32,000	23			13,155	43,000	75,000
Printing and publishing	6	140,000	120	5	41	69,100	38,662	138,908
Pumps, not including steam-pumps	3	11,000	8		1	2,375	8,200	13,000
Saddlery and harness	7	21,600	31			15,201	21,078	44,320
Tinware, copperware, and sheet-iron ware	12	40,600	110	56	4	45,839	67,768	131,900
Tobacco, cigars and cigarettes	22	69,850	117	10	14	43,817	112,822	211,000
Wheelwrighting (see also Blacksmithing; Carriages and wagons)	0	4,150	7		1	3,006	2,600	9,940
All other industries (a)	37	830,940	741	43	30	279,404	1,074,614	1,495,718

a Embracing agricultural implements; boxes, cigar; brick and tile; brooms and brushes; carpets, wood; confectionery; cutlery and edge tools; dentistry, mechanical; drain and sewer pipe; files; iron and steel; leather, curried; lime; looking-glass and picture frames; lumber, sawed; mattresses and spring beds; mineral and soda waters; mixed textiles; musical instruments, organs and materials; musical instruments, pianos and materials; roofing and roofing materials; sash, doors, and blinds; saws; show-cases; soap and candles; upholstering; vinegar; wirework; and woolen goods.

From the foregoing table it appears that the average capital of all establishments is \$10,261 45; that the average wages of all hands employed is \$375 43 per annum; that the average outlay in wages, in materials, and in interest (at 6 per cent.) on capital employed is \$16,419 02.

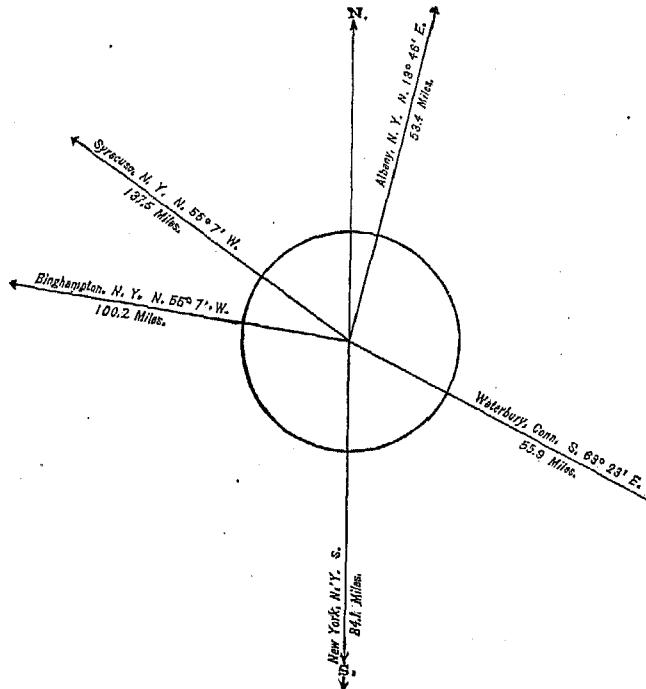
KINGSTON,

ULSTER COUNTY, NEW YORK.

POPULATION IN THE AGGREGATE, 1850-1880.

	Inhab.
1790.....	
1800.....	
1810.....	
1820.....	
1830.....	
1840.....	
1850.....	a 10,232
1860.....	a 16,640
1870.....	b 6,315
1880.....	c 18,344

a Township including Kingston and Rondout. *b* Town of Kingston. *c* City formed by union of Kingston, Rondout, and Wilbur in 1872.



Latitude : 41° 55' North ; Longitude : 74° (west from Greenwich).

POPULATION

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

Male	8,953
Female	9,391
—	
Native.....	14,506
Foreign-born	3,838
—	
White.....	17,864
Colored	*480

* Including 1 Chinese.

FINANCIAL CONDITION:

Total Valuation : \$6,577,904 ; per capita : \$359 00. Net Indebtedness : \$644,880 ; per capita : \$35 15. Tax per \$100 : \$3 93.

KINGSTON.

The city of Kingston is situated in latitude 41° 55' north, and longitude 74° west from Greenwich, on the west bank of the Hudson river, 90 miles north of New York city and 55 miles south of Albany. It received a charter from Governor Stuyvesant in 1661, under the name of Wiltwick ; was first settled in 1665, and was incorporated by patent in 1667. On February 19, 1777, the first state convention of New York adjourned from Fishkill to Kingston, and there, April 20, the first constitution of the state was adopted. The legislature, which met in Kingston in the following September, was dispersed by the approach of a British force under Sir Henry Clinton, and the village was burned October 7, 1777. It was rebuilt, and in 1805 was incorporated as a village. In 1872, Kingston, with Rondout and Wilbur, was incorporated as a city. It is the terminus of the Delaware and Hudson canal, and of the Ulster and Delaware and Wallkill Valley railroads, and is the location of a very large cement manufactory. Its wharfage-front extends 4 miles along the Hudson, and each year it ships to New York city large quantities of blue flagging-stone, brick, ice, lime, and lumber.

Though every opportunity was offered to the authorities of Kingston for a full representation of the city, no information was furnished.

LOCKPORT,

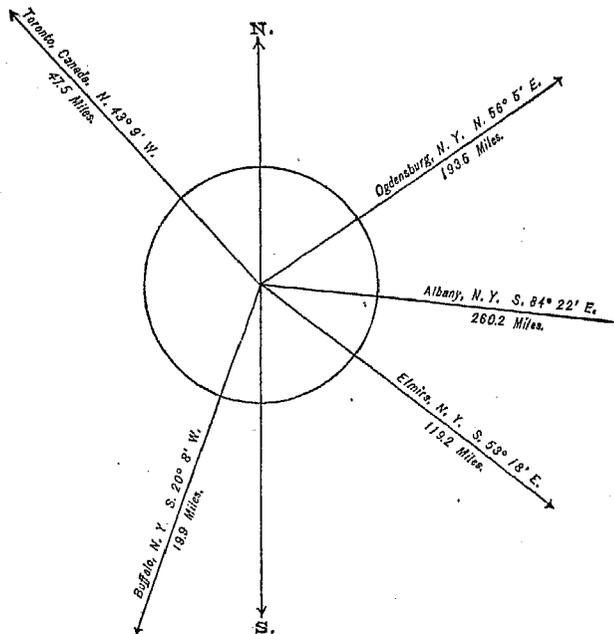
NIAGARA COUNTY, NEW YORK.

POPULATION

IN THE
AGGREGATE,
1850-1880.

	Inhab.
1790.....	
1800.....	
1810.....	
1820.....	
1830.....	
1840.....	
1850.....	a 12,323
1860.....	a 13,523
1870.....	b 12,426
1880.....	b 13,522

a Township of Lockport. *b* City of Lockport—township not included.



POPULATION

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

Male.....	6,374
Female.....	7,148
—	
Native.....	10,250
Foreign-born.....	3,272
—	
White.....	13,325
Colored.....	* 197

* Including 1 Indian.

Latitude: 43° 11' North; Longitude: 78° 46' (west from Greenwich); Altitude: 394 to 655 feet.

FINANCIAL CONDITION:

Total Valuation: \$5,911,523; per capita: \$437 00. Net Indebtedness: \$108,667; per capita: \$8 04. Tax per \$100: \$1 93.

HISTORICAL SKETCH.

It has been truly said that the Erie canal has made Lockport. The nucleus of the village was formed here by contractors and laborers on the canal then in process of construction. The place received its name from the construction here of two series of 5 locks each—each lock with a lift of 12 feet—by which boats are passed up and down the “mountain ridge”, a height of 60 feet.

Lockport was incorporated as a village in 1829, with a population of 3,000. Its prosperity is largely due to its fine location in the center of a good grain- and fruit-growing country, to the valuable water-power afforded by the Erie canal in its descent of 60 feet at this point, and to inexhaustible quarries of limestone and sandstone. Its first newspaper was published in 1824. Two years previously the place was selected as the site of the county buildings. The growth of the city has been steady and healthy, without periods of serious depression or of great activity. It has had no extensive fires or floods. The population is of mixed nationality, the laboring class being mostly of foreign birth.

LOCKPORT IN 1880.

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

LOCATION.

The city lies in latitude 43° 11' north, longitude 78° 46' west from Greenwich, on the Erie canal, 65 miles from Rochester and 18 miles from Niagara Falls. The canal here has a depth of 7 feet and a width of 70 feet, with a capacity for boats of 240 tons. Within the limits of the city the canal changes from the lake Erie to the Genesee level.

RAILROAD COMMUNICATIONS.

The city is touched by the following railroads:

The New York Central and Hudson River railroad, between New York and Buffalo.

The Lockport and Buffalo railroad, between Lockport and Buffalo.

TRIBUTARY COUNTRY.

The country immediately tributary to the city is a rich farming one, grapes and apples being largely grown. The local trade is generally with the farmers.

TOPOGRAPHY.

Lockport lies on the brow of a ridge about 60 feet in height. The soil is varied, including clay loam, sand, and gravel. The underlying rock, which in many places crops out, is pure limestone. The natural drainage is good. The surrounding country for a radius of 5 miles is considerably wooded, and contains no lakes or ponds.

CLIMATE.

The highest recorded summer temperature occurred in 1864, when for twelve days the average was 91°; highest summer temperature in average years, 80°. Lowest recorded winter temperature, February 6, 1855, —22°; lowest winter temperature in average years, —15½°. Lake Ontario, 12 miles north, has a modifying influence on the climate. There is a great deal of miasma said to be caused by low marshes lying 5 or 6 miles north of the city.

STREETS.

The total length of streets is 55 miles, and of these, 1.85 mile is paved with stone blocks and 4.5 miles with broken stone. The cost per square yard of each, as nearly as may be estimated, is, for stone blocks \$1 28, and broken stone 60 cents. Sidewalks are laid with sandstone, flag, and plank. Gutters are paved with sandstone. Trees are planted along the sides of the streets. The streets are repaired both by contract work and by day work, the preference being for the former. No steam stone-crusher or roller is used. There are no omnibus lines or horse-railroads in the city.

WATER-WORKS.

The water-works are owned by a private corporation. The Holly system is used, but the company declines to furnish information. The city pays annually \$1,500 for water for all purposes, including hydrants (133), fountains, public buildings, street-sprinkling, etc.

GAS.

The gas-works are owned by a private company. The charge per 1,000 feet is \$2 50. The number of street-lamps is 500. The gas company declines to give any further information.

PUBLIC BUILDINGS.

The city-council chambers are rented by the city for the purpose.

PUBLIC PARKS AND PLEASURE-GROUNDS.

There are 2 parks in the city, with a total area of 10 acres:

Dudley's Square, in the eastern part of the city, area 8 acres.

Public Park, on the west side of the city, area 2 acres.

Dudley's square was given to the city by Charles E. Dudley and others, while the Public park cost \$7,000, including land and improvements. No statistics as to the number of visitors to the parks were to be had. The parks are laid out and controlled by the common council.

PLACES OF AMUSEMENT.

Lockport contains one theater, known as Hodge opera-house, with a seating capacity of 2,000. Theaters pay an annual license to the city of \$25. Of concert-halls and lecture-rooms, etc., there are: Arcade hall, seating capacity, 500; Daniels hall, arranged especially for dinner- and supper-parties, etc., accommodates from 500 to 600; and 6 society halls. In the summer some of the beer-sellers have temporary gardens, but there are no regular concert- and beer-gardens in the city.

DRAINAGE.

No information on this subject was furnished.

CEMETERIES.

No information on this subject was furnished.

SANITARY AUTHORITY—BOARD OF HEALTH.

The chief sanitary authority of Lockport is vested in a board of health, an independent organization, composed of the mayor, city clerk, health officer, and three aldermen. The health officer is a physician, and is appointed by the common council. The mayor appoints the health committee, the three aldermen. The annual expense of the board, in absence of any declared epidemic, is from \$300 to \$500, for salary of inspector and for disinfectants. There is no provision for an increase of expenses in case of an epidemic. The authority of the board, in the absence of an epidemic, extends to the preservation of the public health by any means it may deem necessary. During an epidemic the board may establish quarantine, and generally exert all needed authority for the preservation or betterment of the health of the city. The chief executive officer of the board is the health officer. The business of the board is transacted at meetings held only on the call of the mayor, who is president *ex officio*. All complaints received are referred to the health inspector. One assistant health officer or health inspector is employed, at a salary of \$1 50 per day. He is not a physician and has no police powers. Inspections are made regularly. When nuisances are reported and found to be such, the parties responsible are notified to abate them. If they do not do it suit is brought against them. It is the custom, concerning the correction of defective house-drainage, privy-vaults, cesspools, sources of drinking-water, etc., to notify the proper parties to remedy the defects. The same also applies to defective sewerage, street-cleaning, etc. The board exercises no special control over the conservation and removal of garbage. The only regulation of the board concerning the burial of the dead is that graves must be not less than 5 feet deep. The board forbids the throwing of any noisome substance into any canal, slip, basin, or running stream in the city. Excrement is not allowed to be removed, except under directions of the board, between June 1 and September 15, and at all other times of the year only between the hours of 11 p. m. and 4 a. m.

INFECTIOUS DISEASES.

Small-pox patients are isolated, either by removal to a pest-house or hospital, or by quarantine at home. In the latter case a card is placed on the building, marked "small-pox". There are no special regulations as to scarlet-fever patients. The board is specially careful about the illness of school-children, and requires all infected with contagious diseases, or exposed to them, to remain away from schools. Vaccination is compulsory only on school-children, and is done at the public expense.

MUNICIPAL CLEANSING.

Street cleaning.—The streets are cleaned by the abutters, wholly by hand, and the scrapings are removed by the city with its regular force. The cleaning is done on the principal (Main) street every Friday, and on the others only as needed. The work is reported as being well done, and the annual cost to the city is about \$1,000. The cost to private parties is not known. The sweepings that are suitable for the purpose are used for filling low lots, etc., while the remainder are buried. Regarding the system, Mayor Pound says:

For a city of our size, where the work is done under the direction of the common council, it is a fair plan. I think the entire work ought to be done for the street-cleanings, which are valuable for manure.

Removal of garbage and ashes.—Garbage is removed both by the city and by householders. What the city does is done with its own force. There are no regulations as to the conservancy of garbage while awaiting removal, other than that it must not become a nuisance. Ashes and garbage may be kept in the same vessel. The garbage is usually buried, while the ashes are used for filling. The cost of removal, to the city, is included in the street-cleaning, no separate account being kept. The system is considered adequate by the city authorities.

Dead animals.—The carcass of any animal dying within the city must be removed and buried by the owner, if he is able; otherwise the work is done by the health inspector. The annual cost of this work is slight and the number small. The system is reported to work "well enough".

Liquid household wastes.—The chamber-slops are mostly run into the sewers, as are nearly all the liquid household wastes of the city. A very little of the wastes is run into street-gutters, and a little into dry wells and cesspools, in

low places. So far as known, the cesspools do not receive the wastes from water-closets. They are cleaned out in the same manner and at the same time as privy-vaults. Certain wells have been thought to be contaminated by the overflowing or underground escape of the contents of cesspools and privy-vaults.

Human excreta.—About one-tenth of the houses in the city have water-closets, most of which deliver into the public sewers, and the remainder depend on privy-vaults; none of the latter are believed to be water-tight. There are no regulations as to their construction. They can not be cleaned between June 1 and September 15, except under direction of the board of health, and during the rest of the year must be cleaned only between the hours of 11 p. m. and 4 a. m. If, however, they become nuisances, they can be ordered to be cleaned at any time. The dry-earth system is not used. The night-soil is ultimately used as manure, none of it being allowed on land within the gathering-ground of the public water-supply.

Manufacturing wastes.—There are no special rules regarding the final disposal of liquid or solid manufacturing wastes, except that they must not become a nuisance.

POLICE.

No information on this subject was furnished.

PUBLIC SCHOOLS AND FIRE DEPARTMENT.

Regarding schools and fire department, the mayor says:

The union school system originated here. Our public schools are under the control of a board of education. The union school is what I think would be called a high school in your state [Rhode Island]. There are classical and English courses in it. There are secondary schools preparing students for the union school. Graduates from the union-school classical department are prepared for college, though not so well prepared as the students from Fall River and other places in New England. We raise about \$20,000 to \$22,000 per annum for the support of our school system.

Our fire department consists of 6 companies—4 hose companies, 1 hook-and-ladder company, and 1 engine company. We have the Holly system of water-supply, which is used for extinguishing fires. Our fire department costs \$4,500 per annum, but is a volunteer organization, and this sum is expended in keeping apparatus in repair, heating houses, etc.

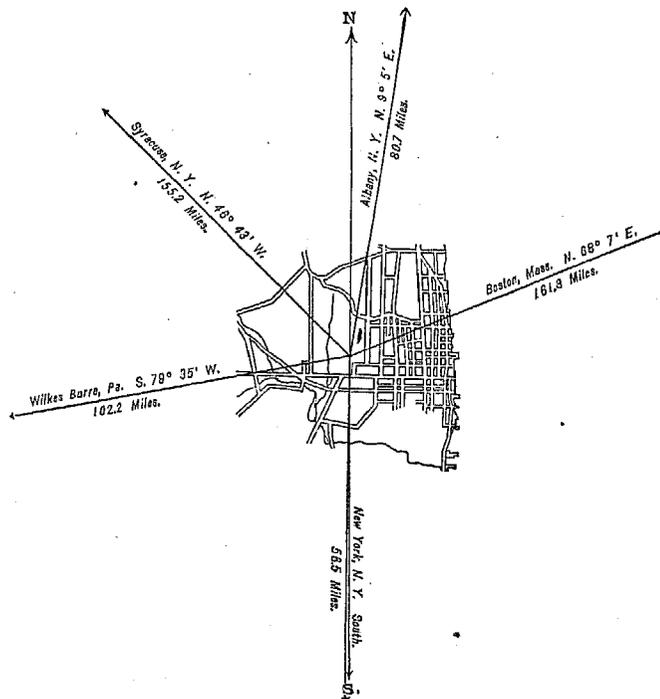
NEWBURG,

ORANGE COUNTY, NEW YORK.

POPULATION
IN THE
AGGREGATE,
1790-1880.

	Inhab.
1790.....	2,365
1800.....	3,258
1810.....	4,627
1820.....	5,812
1830.....	6,424
1840.....	8,933
1850.....	11,415
1860.....	15,196
1870.....	a 17,014
1880.....	18,049

a City of Newburg incorporated 1865; all previous figures refer to the township.



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

Male	8,397
Female.....	9,652
—	
Native	14,273
Foreign-born	3,776
—	
White.....	17,473
Colored	*576
<small>* Including 2 Chinese and 1 Indian.</small>	

Latitude : 41° 31' North ; Longitude : 74° (west from Greenwich) ; Altitude : 0 to 500 feet.

FINANCIAL CONDITION :

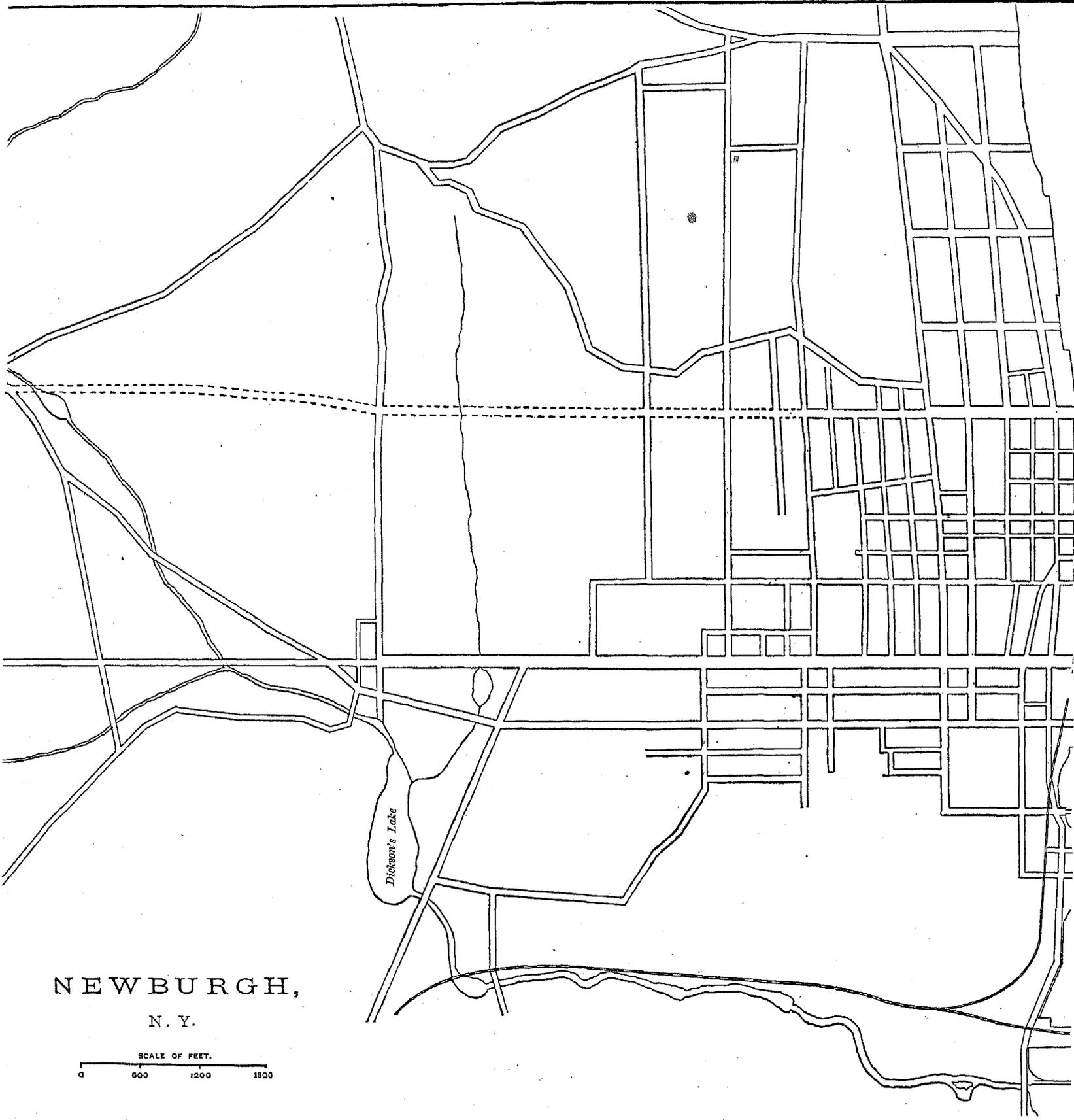
Total Valuation: \$8,798,010; per capita : \$487 00. Net Indebtedness: \$313,400; per capita: \$17 36. Tax per \$100 : \$1 48.

HISTORICAL SKETCH.

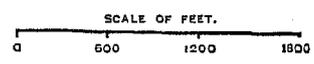
The present city of Newburg is included in lands purchased by Governor Dougan, of New York, in 1684, and conveyed by patent ten years later to Captain John Evans. This patent was annulled in 1699, and the lands were granted out in ten parcels in the years between 1714 and 1739. In the year 1688, Louvois, the war minister of Louis XIV, in order to cripple the enemies of France, gave orders for the devastation of the Palatinate, a strip of territory on the middle Rhine, now included in Bavaria, Baden, Hesse-Darmstadt, and the states of Rhenish Prussia. The French generals, eager to prevent as much suffering as possible, gave the people warning of the fate awaiting them. Quickly gathering such things as they could carry, the poor Germans fled for their lives, and wandered about in Europe for some years seeking a new home.

A party of them came to England in 1708, and the English government, which had been for a long time debating the wisdom of collecting the poor outcasts from the Palatinate and sending them to America as colonists, determined to send this party to the banks of the Hudson. Queen Anne, who was greatly interested in the fugitives, herself bore the expense of their passage to New York, where they landed in the winter of 1708-9. They were at once sent to the region about Quassaick creek, 60 miles above New York. In 1719 they were granted a patent of the tract on which they lived, and were assigned the name of the "Palatine parish by Quassaick". The Germans were chiefly farmers accustomed to tilling the fertile lands of the Palatinate, and the soil of Quassaick seemed to them so barren that after a few years most of them sold their lands and removed to richer fields. Their places were filled by newcomers, known among the old settlers as "the Dutch and English new inhabitants", since they belonged to the English and Reformed Dutch churches, while the early settlers were Lutherans. By the year 1743 the settlement had passed almost entirely from the hands of the Germans to those of the Scotch and English, and had received from them the Scotch name of Newburg. Not only did the newcomers change the civil institutions of the settlement, they also changed its religious organization. With the withdrawal and death of many of the old settlers the Lutheran society had become very small, while the newcomers, chiefly Episcopal, desired to have a church of their own, and to obtain for its support the income of the glebe lands, which, under the patent, were devoted to the support of the Lutheran minister and the school-master. Accordingly, in 1747, the settlers met and appointed two trustees to obtain an Episcopal minister for the settlement. This the Lutherans opposed, until a decision of the council of the province in 1749, refusing to set aside the election and act of the Episcopal trustees, practically put an end to the Parish by Quassaick. In the year 1752 another patent of the glebe lands was made to Alexander Cobden and Richard Albertsan, as trustees, who, with their successors, were to constitute the parish of Newburg, and to hold and use the glebe lands for the maintenance of an Episcopal minister and of a school-master. The land thus granted was at once divided into streets and lots, and the growth of the parish became more rapid. The population increased as other patents within the district were taken up and settled, and in 1762 Newburg was set off from the precinct of Highlands and made a precinct by itself.

The records of the town of Newburg date from the following year, when the citizens met and elected the precinct officials. Newburg then included the present towns of Marlborough and Plattekill, which ten years later were incorporated as the town of New Marlborough, leaving Newburg with its present bounds. Although so long under the almost direct control of the provincial government, and hence likely to be influenced by it in favor of the king, the great majority of the people of Newburg were zealous adherents of the patriot cause. The news of the battle of Lexington led to the formation of a "committee of safety and observation", under whose auspices a canvass of the precinct was made and 174 names obtained to a paper promising support and obedience to the continental and provincial congress, while the names of 54, who refused to sign, were recorded. Newburg contributed new and cordial support to the continental armies, and in 1782, after the defeat of Cornwallis, Washington encamped his army at New Windsor and Newburg, making the latter his headquarters. Here in the old Hasbrouck mansion he met his officers, among them La Fayette and Steuben, as general and host; here he was offered the crown of America; here he quelled, by his will and prompt measures, the hostility arising in the army against Congress, and demonstrated anew his great ability and pure patriotism. At Newburg the army celebrated the declaration of peace, on April 19, 1783, happy eighth anniversary of a sad event, and here took place the sad scenes of parting which followed the disbanding of the forces. The place was greatly impoverished by the war, yet it owed to the war an important addition to its population, for many of the refugees driven from New York by the British occupation came to Newburg, while many of the officers and men of the disbanded army concluded to make their last camping-ground their future home. The early settlers, though building their houses near the river, had made no good landing-place, so the army found it necessary to construct a pier at Third street. Around this pier streets and lots were laid out in 1782, and this plot, lying between First, Montgomery, and South streets, and the Hudson river, was named the township of Washington. It increased rapidly, and in 1790 was the most populous portion of the town. The period from the close of the Revolution to the opening of the Erie canal in 1823 is the period of Newburg's comparatively greatest growth and prosperity. Although in 1785 the people were so poor that they had to ask aid from the legislature, by 1811 the town paid one-quarter of the whole tax of the county. In the year 1788 Newburg received the name of "town" in place of "precinct". Its business increased rapidly, the lumber and ship-building industries becoming of special importance. In the year 1800 a portion of the people threw off the town title and were organized as the village of Newburg. The citizens were engaged in many enterprises to increase the wealth and importance of the town. In 1801 a company, with a capital of \$126,000, was incorporated, and empowered to construct a turnpike-road from Newburg to the Delaware river. Other roads followed, and the village and town soon brought to themselves much of the trade of western and southern New York and of northeastern New Jersey. In 1819 the citizens of Newburg subscribed largely toward the construction of a steamer to ply on lake Cayuga and continue the Newburg stage-lines to Ithaca. The canals and railroads which brought prosperity to so many places caused the decline of Newburg's prosperity. The Erie canal drew away nearly all the trade of western New York to Albany and the towns along the canal. The Delaware and Hudson canal took to Kingston the trade of southern New York and a remnant of the western trade; and finally Newburg was left with only the New Jersey and the local trade. The citizens, seeing their village left on one side in the march of progress,



NEWBURGH,
N. Y.



made strenuous efforts to induce the Erie Railway Company in building its road to run the main line through Newburg. This they found impossible, but they succeeded in obtaining a branch road joining the main line at Turner's, toward the expense of which Newburg contributed over \$200,000. Although the branch, which was completed in 1849, proved a benefit to the village, the construction of other branch roads drew off much of the advantage Newburg had hoped to obtain. For some years business was prostrated, houses became tenantless, and tradesmen shut up their shops and removed to more favorable localities. With the civil war and the impetus which business then received, Newburg became a prosperous, although it can never hope to be a large or important, city. The village was made a city in 1865, and in 1880 had 18,049 inhabitants, while the town has but 3,918. The harbor of Newburg is said to be the finest on the Hudson. Between 1830 and 1840, when the citizens were looking eagerly for industries to take the place of those lost by means of the canals, a company fitted out a number of vessels and began the business of whaling, but after a moderate success the industry was abandoned. In the year 1804 an agitation began which resulted, in 1819, in the completion of a system of water-works, supplying the village from certain springs. This supply was kept up until, in 1860, a new one was obtained from Little pond. Gas was introduced in 1852. The first newspaper, the *Newburg Packet*, was established in 1795, and has had many successors. The city possesses a fine public library, formed by the union of many earlier libraries, and has 22 churches. The present condition of the city may be seen from the statistical accounts which follow.

NEWBURG IN 1880.

The following statistical accounts, collected and furnished by H. B. Benkard, esq., of Newburg, show the present condition of the city:

LOCATION.

Newburg is situated in latitude 41° 31' north, and longitude 74° west from Greenwich, on the west bank of the Hudson river, about 60 miles north of New York city. Its average altitude is 250 feet above tide-water, the lowest point being at the level of the tide, the highest rising 500 feet above it. The Hudson is here deep enough to accommodate vessels drawing more than 28 feet of water, and steamers run regularly between New York and Troy, touching at Newburg, which thus has water communication with all the important places on the Hudson.

RAILROAD COMMUNICATIONS.

Two branches of the New York, Lake Erie, and Western railroad have their termini at Newburg—the Newburg and New York, and the Warwick Valley railroads, connecting the city with New York and the towns of northeastern New Jersey. A ferry to Fishkill connects Newburg with the New York Central and Hudson River railroad, and with the New York and New England railroad, the eastern terminus of which is Boston, Massachusetts. Another railroad, the New York, West Shore, and Buffalo, is in process of construction, and will run directly through the city.

TRIBUTARY COUNTRY.

The country about Newburg is mainly agricultural. There are many fine country-seats and valuable farms in the vicinity. Before the era of railways nearly all the agricultural produce of northern New Jersey and Pennsylvania was shipped to New York by way of Newburg, but this trade is almost entirely gone.

TOPOGRAPHY.

The land on which Newburg is situated rises as it recedes from the Hudson river. The city is thus on a hill-side, with a soil warm and productive. The underlying rock is slate and limestone. The natural drainage is excellent. Orange lake, about 6 miles west and 500 feet above the river, covers about 400 acres, and is the only lake or pond of any size in the vicinity. The country is generally open and bare of trees.

CLIMATE.

Careful records of temperature have been kept at the Newburg academy, and the Smithsonian tables of temperature furnish the following statistics: In the years from 1828 to 1870 the highest recorded temperature was 105°, in July, 1849; the lowest recorded temperature was -27°, in January, 1835. The average summer temperature is 70.67°, while the average temperature in winter is 28.57°, the yearly average being 49.99°. The presence of the Hudson, which is here a mile wide, tends to reduce both the extreme heat of summer and the extreme cold of winter.

STREETS.

Newburg has about 50 miles of streets. Of these about 3 miles are paved with cobble-stone, 500 feet with Belgian-block pavement, about 300 feet with broken stone, while the rest are all dirt roads. The cost of the cobble-stone pavement per square yard is from 60 to 75 cents, and of the Belgian pavement \$3 50. The total cost of work on the streets is about \$6,000 per annum. The sidewalks are of blue flagstone, and the gutters of flagstone or of cobble-stone. Trees are planted along the streets to a considerable extent. Repairs are done by day labor, under the direction of the street superintendent. A steam stone-crusher has been in use of late and has given general satisfaction. There are no horse-railroads or omnibus lines.

WATER-WORKS.

The total cost of the construction of the water-works of Newburg from 1852 to 1880 has been \$421,396 40. The works are upon a gravity system, but it often happens that pumping must be resorted to, as the level of the water in the springs and pond falls below the pipe supplying the city. The income from water-rates during the past year was \$27,791 91, the average annual income being about \$27,500. Only 5 meters are in use; these are of the Worthington pattern, and lead to a great saving in the amount of water used.

GAS.

Private persons are supplied with gas either by the Newburg Gas Light Company or by the Consumers' Gas Company. The city contracts with the latter company for lighting the streets, paying \$30 a year for each light. There are 171 gas street-lamps and 176 naphtha-lamps; the latter cost the city \$24 each per year. The daily average production of gas is 65,000 feet, and the charge per 1,000 feet is from \$2 25 to \$2 50. The gas used is that produced from steam by the Lowe process, the old coal-gas being abandoned.

PUBLIC BUILDINGS.

The total value of the buildings owned by the city and used for municipal purposes is stated to be \$300,000. Newburg has no city hall, the municipal offices being in a building hired by the city at an annual rental of \$750.

PUBLIC PARKS AND PLEASURE-GROUNDS.

The only public pleasure-ground of the city is the estate used by Washington as headquarters during the encampment of his army at New Windsor and Newburg in the years 1782 and 1783. It is situated on Washington street, between Liberty, Golden, and South William streets, and contains about 3 acres. It is owned by the state, which pays half of the annual cost of maintenance, \$500, the city also paying \$500, the other half. The house contains a good collection of manuscript and revolutionary relics. The park is open to the public, and during the past thirty years the janitor reports that there have been 258,722 visitors.

PLACES OF AMUSEMENT.

The opera-house, so called, is the only theater in Newburg; it seats about 800. A license of \$5 is paid to the city for each entertainment. The assembly rooms and Townsend hall, each seating about 300, are used for concerts and lectures. There are no concert- or beer-gardens in the city.

DRAINAGE.

The situation of Newburg on the west bank of the Hudson river enables it to be drained by sewers having an almost precipitous descent. The extent of its public sewers in 1880 was nearly 8 miles. As a rule they have carried the storm-water, but, in case of obstruction, the accumulations of water under so great pressure causes considerable damage. Mouths of outfalls are submerged, except at very low tide, and there is no provision for ventilation. There is no systematic plan for the sewerage of the city, but each piece of work is done according to the local and immediate requirements. Cement pipes of sizes according to requirement are extensively used. Brick sewers are made from 12 inches to 4 feet in diameter. The ordinary depths at which they are laid are 9 or 10 feet. Contract prices range from \$1 50 to \$3 per linear foot. The average cost of manholes and catch-basins is stated to be from \$95 to \$150 each. The cost is usually assessed upon property benefited upon the basis of frontage, but some sewers have been paid for by a general tax upon the city.

CEMETERIES.

There are 3 cemeteries within the city limits. These cemeteries, the *Old Burying-ground*, *Saint George's Cemetery*, and *Saint Patrick's Cemetery*, are all quite small and are not greatly used. The number of interments in them can not be stated. No burial is allowed until a permit has been obtained from the city clerk or the health officer. *Cedar Hill Cemetery*, situated 5 miles north of the city, and *Woodlawn*, 2 miles south of Newburg, are now chiefly used by the inhabitants of the city for burials.

MARKETS.

Newburg has no public or corporation markets.

SANITARY AUTHORITY—BOARD OF HEALTH.

The chief sanitary authority of Newburg is vested in a board of health appointed annually by the mayor. It consists of 4 members, one of whom must be a physician, and is independent of the city government. The annual expenses of the board vary from \$300 to \$500, which includes the salary of the health officer, \$250, the pay of such assistants as are employed, and all incidental expenses. The members of the board receive no salary. In case of an epidemic the board can increase its expenditures to any amount it may think necessary. Its powers both in the absence of and during an epidemic are absolute over all matters pertaining to the public health. The chief executive officer of the board is the health officer, who is appointed annually by the mayor with the consent of the common council; he must be a physician, receives a salary of \$250, and must attend at the office of the board from 11 to 12 a. m. each day to grant burial permits, keep the statistics of diseases, deaths, and births, and to transact any business properly coming before him. Regular meetings of the board are held monthly, and special meetings whenever summoned. Such assistant inspectors are employed as are deemed necessary.

NUISANCES.

Inspections are made whenever nuisances are reported. The health officer makes the inspection and reports to the board of health. If a nuisance exists, a notice is served on the owner or occupant of the premises, ordering him to abate or remove it. If this order is disregarded, the board makes the abatement and charges all expense upon the estate. Defective house-drainage, privy-vaults, cesspools, sources of drinking-water, etc., are controlled by the board, which also has power to compel those living near a sewer to connect their drains with it.

GARBAGE.

No house-offal is allowed to be thrown into the streets. The city contracts for the removal of offal from the houses, and the board of health interferes only when the removal causes a nuisance.

BURIAL OF THE DEAD.

Interments are not allowed until a permit of burial has been obtained from the health officer, who is bound to grant one on receipt of a certificate of death.

INFECTIOUS DISEASES.

Small-pox patients are removed to a pest-house on the outskirts of the city. Scarlet-fever patients are quarantined at home under the direction of the board of health. The board has full power to take any action it may deem best in case contagious diseases break out in the public or private schools. Vaccination is compulsory, and is sometimes done at the public expense.

REPORTS.

The health officer makes an annual report to the board of health, and this report is generally published. It includes, besides the regular health report, the statistics of diseases, births, and deaths, which are kept by the health officer acting as a registrar of vital statistics.

MUNICIPAL CLEANSING.

Street-cleaning.—The streets are cleaned by the abutters, a contractor then removing the collected heaps of sweepings. The work is done wholly by hand, and costs the city \$200 each year. The business streets are cleaned three times a week, the other streets twice a week.

Removal of garbage and ashes.—The city contracts for the removal of garbage, which is taken by the contractors beyond the city limits. While awaiting removal it must be kept separate from ashes. These are also removed by contractors. The annual cost to the city is about \$200.

Dead animals are removed by the superintendent of streets. The cost of this service is small, only a few animals being removed each year.

Liquid household wastes.—In that part of the city where there are sewers all household wastes are run into them. Away from the sewers cesspools are used, although in several thickly-settled streets the wastes are run into the street-gutters. The cesspools are generally porous and rarely provided with overflows; frequently they receive the wastes from water-closets. Numerous cases of the contamination of drinking-water by the soakage from vaults and cesspools have occurred, and the board of health is anxious to compel all persons to use the public water-supply and abandon the wells. Cesspools must be cleaned whenever the board of health so orders, and the permission of the board must always be obtained before cleaning will be allowed.

Human excreta.—Although water-closets are extensively used throughout the city, there are yet fully 2,000 privy-vaults in use. Most of these are not water-tight and are a constant source of filth. The ordinances of the city require that all vaults constructed in the future shall be made of brick or stone and be water-tight. If near a sewer, they must be connected with it. A permit must be obtained from the health officer before cleaning or opening any vault. The ultimate disposal of the night-soil is not stated, but none is allowed to be used as a fertilizer on lands within the gathering-ground of the public water-supply.

Manufacturing wastes.—No information on this subject was furnished.

POLICE.

The police force of Newburg is appointed by the mayor, subject to confirmation by the common council. The men are appointed for life, and hold office during good behavior. The chief executive officer is the city marshal, who receives a salary of \$900 per annum, and has the general charge of the department. The rest of the force consists of 2 sergeants, salary \$750 each per annum; and 10 patrolmen, at salaries of \$700 each. The uniform is a navy-blue suit, with brass buttons, and with a white stripe upon the trousers. In summer a straw hat is worn, in winter a dark-blue derby. The men provide their own uniforms. They are armed with billies and revolvers, and patrol about 50 miles of streets, each patrolman being on his beat 6 hours.

During the past year the police made 740 arrests, the principal cause being drunkenness. About \$500 was stolen and reported to the police, and of this \$350 was recovered and returned to the owners. There were 278 station-house lodgers in 1880, against 400 in 1879; no meals are furnished to these. The police are required to co-operate in all ways with the other departments of the city government. Special policemen are appointed by the mayor for terms not exceeding two weeks. They have the same powers and pay as the regular force, and are under the control of the marshal or mayor, as the latter may determine. The cost of the force in the past year (1880) was about \$11,000.

FIRE DEPARTMENT.

The fire department of Newburg is composed of volunteer members, confirmed by the common council. The chief executive officer is a chief engineer, who, with 3 assistant engineers, is elected for a term of three years by the members of the department. The force consists of about 430 men, who constitute 3 engine, 7 hose, and 1 hook-and-ladder companies. The apparatus consists of 2 steam fire-engines, 1 ~~1~~ engine, 1 hook-and-ladder truck, 7 hose-carriages, 3 four-wheeled tenders, 3 two-wheeled hose-carts, 3 sets of bob-sleighs, 1 reserve hook-and-ladder truck, and 1 reserve hose-carriage. The department has about 9,000 feet of hose. Water is supplied from 181 hydrants. During the year ending June, 1880, there were 22 alarms of fire. The value of the property destroyed was \$3,556 56, and an insurance of \$1,825 56 was paid upon it. The annual expense of the department was about \$5,000.

PUBLIC SCHOOLS.

During the past year 3,348 pupils were registered in the public schools. The average daily attendance was 2,219. The amount raised for school purposes during the year was \$31,400. The schools are also supported by a fund known as the "glebe fund", which now amounts to \$17,955 61. A very close connection is maintained between the schools and the public library, which contains 12,204 volumes. The board of education has eight members, who serve terms of 4 years each, 2 being elected each year.