

"URBS INCINERATA."

HISTORY
OF
CHICAGO.

FROM THE

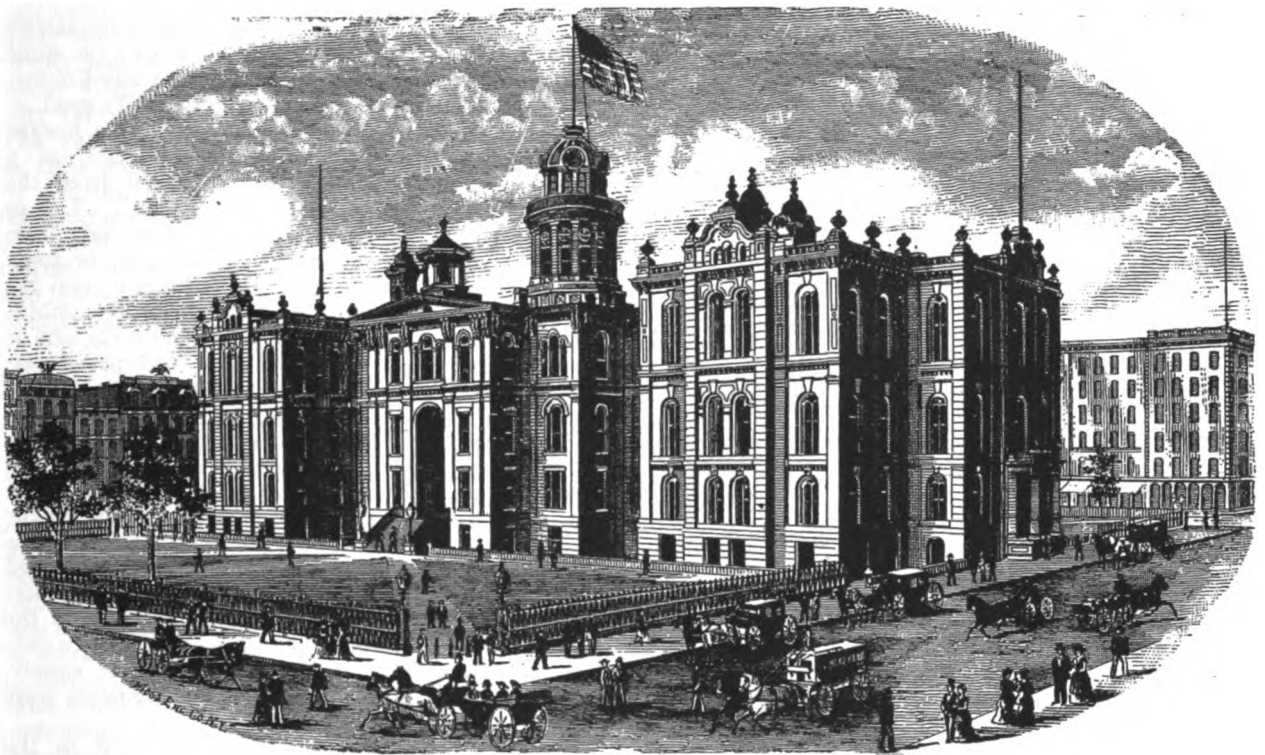
EARLIEST PERIOD TO THE PRESENT TIME.

IN THREE VOLUMES.

VOLUME II.—FROM 1857 UNTIL THE FIRE OF 1871.

BY A. T. ANDREAS.

CHICAGO:
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1885.



THE COURT-HOUSE BEFORE THE FIRE.

latter gentlemen fulfilling the contract. Work was begun November 3, 1869, on the north coffer-dam and by the last day of March, 1870, the masonry was completed from the center of the river to a point fifty feet north of the north dock line. With the exception of a change in grade from 1 in 16 to 1 in 20, the liberal use of asphaltum for the brick beds, and a head-way two feet higher, this subterranean passage varies little from the Washington-street tunnel. The LaSalle-street tunnel was opened to the public July 4, 1871. Its length is 1890 feet and its cost was \$566,000. The fire of October warped the railing around the open approach to the tunnel, as it did that of the east approach of the one on Washington Street, rendering a considerable portion of it unfit for anything but scrap iron. The stone coping was also somewhat damaged.

ELLIS S. CHESBROUGH, as the constructor of the two lake tunnels, stands among the world's great civil engineers. Previous to coming to Chicago, most of his professional life was passed upon eastern railroads. He was the son of Isaac M. and Phrania (Jones) Chesbrough, and on account of his father's failure in business, Ellis lost much schooling which otherwise would have been given him, working for various mercantile establishments in the city of Baltimore, where he was born, and where he spent his days up to his seventeenth year. At the age of fifteen his father became one of a company of engineers employed by the Baltimore & Ohio Railroad Company, and, through his influence, the son also obtained employment in the same line and with the same corporation. Ellis remained with the Baltimore & Ohio Railroad Company until 1830, when he entered the service of the State of Pennsylvania, in the survey for the projected Allegheny Portage Railroad. During the succeeding eleven years he was employed on the Patterson & Hudson, the Boston & Providence, the Taunton Branch, and the Louisville, Charleston & Cincinnati railroads, being a member of the engineering corps of Captain, afterward General, William Gibbs McNeill. In 1840, Mr Chesbrough was appointed superintendent of construction of the last named railroad, and held that position until the line was completed to Columbia, S. C. He then went to Providence, R. I., where his father resided, and, after spending a few months in the shops of the Stonington Railroad Company, was thrown out of employment by stress of hard times, tried farming and failed, and finally,

in 1844, returned to his profession. In 1846, he was appointed engineer of the Water Commissioners of Boston, and upon completing the structures along the line of the Cochituate aqueduct, was elected Water Commissioner, and subsequently City Engineer. Having been appointed chief engineer of the Board of Sewerage Commissioners of Chicago in December, 1855, Mr. Chesbrough presented a plan for a sewerage system of the city, which was adopted by the municipal authorities, and fixed his reputation as an expert in that specialty throughout the country. The next year he went to Europe to obtain information relative to the drainage of cities, and his report was published by the Board, and has been considered standard authority on the subject ever since. In 1861, when the sewerage and water systems of the city had become so cumbersome as to require a larger governing organization, a regular board of public works was established, Mr. Chesbrough being chosen chief engineer, and subsequently city engineer. The latter position he retained until succeeded by Dewitt C. Cregier, four years ago. The wonders which he accomplished for Chicago during that period, are detailed in that portion of the corporate history devoted to the grand march of public improvements from 1861 to 1882. For the past few years Mr. Chesbrough has retired from the active duties of his profession. His wife, formerly Miss Elizabeth A. Freyer, of Baltimore, Md., whom he married in 1837, is still living.

SEWERAGE SYSTEM.—Previous to the organization of the Board of Public Works, about 54.5 miles of sewerage had been constructed—6.02 miles in 1856; 4.86 miles in 1857; 19.29 miles in 1858; 10.45 miles in 1859; 13.07 miles in 1860; and .53 miles in 1861. Although but 2,826 feet were constructed in 1861, three-fourths of this amount was built by private, and interested parties. The board had no resources from which to draw, and suit was commenced against the Sewerage Commissioners for \$58,882.84, on orders which the Marine Bank refused to pay at par, and for \$107,746.53 against S. Lund, treasurer of the late board. In 1862, about three miles of sewers were constructed, principally of brick. The balance of the account due from S. Lund, now found to amount to \$108,696.53, had not been obtained. After the year 1863, when the finances of the city were somewhat embarrassed, the construction of sewers and the growth

of the system progressed favorably. Following is a table covering the period, commencing with the time the Board of Public Works assumed charge, up to and including 1871, the figures for 1861 being the number of feet constructed up to that year, with cost :

YEAR.	FEET BUILT.	COST.
1861	283,586	\$665,188 46
1862	2,856	3,617 31
1863	15,676	57,264 51
1864	39,605	169,299 29
1865	25,021	87,221 48
1866	29,948	137,643 02
1867	48,127	225,564 53
1868	89,661	416,730 51
1869	47,841	197,152 92
1870	139,705	654,141 26
1871	78,166	258,664 70
Totals	800,192 ft. or 151 288-528ths miles.	\$2,872,487 99

The damage to the sewerage system, by the great fire, was comparatively light, consisting of injury to man-hole and catch-basin covers, and in the extra expense occasioned in cleansing sewers and basins, caused by the deposits of lime and debris from burnt buildings. The loss in this department is estimated at \$42,000.

THE CITY HALL.—The joint building which had been completed in 1853 by the city and county for their municipal purposes, after a few years was found to be entirely inadequate to the public wants; and in 1869 the Board of County Commissioners and the Common Council of the city agreed upon an enlargement. Two wings and an additional story were added to it, and these were completed during the year 1870. The west



INTERIOR OF COURT-HOUSE RUINS.

half of the court house as it stood, was purchased outright by the city from the county, and entirely remodeled. This, with the additions, gave room for all the city officers, except those of the Board of Education. The cost to the city of its portion of the addition, including the purchase money for the half

bought from the county, together with the cost of remodeling and furnishing, was \$467,000. The original building was of marble, from the Lockport quarries of New York. The additions were built of the stone from the well-known Lemont quarries of Cook County.

THE WATER SYSTEM.—THE LAKE TUNNEL.—The early settlers of Chicago were ever gazing toward Lake Michigan as the source from which, as a people, they were eventually to be saved from the vileness of their then water "privileges." Up to 1858 they had not gone more than a few rods from the shore; nor did they make the attempt for some years thereafter. It seemed to slowly dawn upon the municipal authorities that, as servants of the public, they were called upon to look to the quality as well as the quantity of the drinking supply. Two new reservoirs, each having a capacity of half a million gallons, were erected in 1858, one being placed in the North and one in the West Division of the city. During that year the average daily supply was three million gallons. For several years the operations of the old works were uniform and satisfactory, except at periods during the coldest weather, when vast quantities of fish and ice collected at the mouth of the inlet pipe and threatened to cut off the supply entirely. The Board of Water Commissioners having met the immediate wants of the community as to quantity, now began seriously to consider the question of purity of the water supply. Surveys and estimates of various improvements were made.

During 1860 five plans were submitted to the Council for attaining the requisite purity. First, by extending a pipe one mile out into the lake; second, by building a tunnel one mile under the lake; third, locating the pumping works at Winnetka; fourth, by the construction of filter beds; fifth, by the erection of a subsiding reservoir. The suggestions did not receive much attention, but the people continued to cry for the purest water which could be obtained. The next year (1861) E. S. Chesbrough, as the newly appointed city engineer, submitted to noted chemists a number of samples of water, taken from the lake and river. One fact was ascertained which, at first, gave rise to some surprise, viz., that water taken from near Clark-street bridge, in the spring, was found purer than that taken from the lake, one mile from Cleaverville. This was afterward explained, on the ground of "freshets." The investigation continued from early in the spring to late in the fall, and the fact was demonstrated that the water of Lake Michigan, some distance from the shore, was superior in every respect to that used by any other city, and could not be excelled.

In 1862 Mr. Chesbrough made an elaborate report to the Common Council in regard to obtaining a better water supply, and then for the first time forcibly pointed out the benefits of the tunnel system, which he subsequently carried to a splendid engineering triumph. Meanwhile the water supply had increased from about three million of gallons daily, in 1858, to 6,400,000 gallons in 1863. The tunnel plan having been adopted in June of that year, an exploration of the lake bottom was commenced by Mr. Chesbrough, about twenty feet from shore. It was ascertained that the underlying stratum was a thick bed of blue clay, for some distance to the eastward. At about three-quarters of a mile from the shore, a boring

was made through the upper layer of sand and the thirty feet of blue clay, the water at that point being twenty feet deep. Two miles and a half east of the Water Works, at a point where is located the present crib, the strata revealed no change of consequence. The water in this locality was thirty feet deep, and as clear and cold as if flowing from living springs. At a depth of thirty-six feet the water was $51\frac{1}{2}^{\circ}$ in temperature, while it reached 60° on the surface. The revised city charter of February, 1863, had authorized the extension of aqueducts and inlet pipes into the lake and provided for their protection. Mr. Chesbrough's plan was formally adopted by the city, in September of that year. Proposals for constructing the tunnel were received on the ninth of that month. The contract was awarded to Messrs. Dull & Gowan, of Harrisburgh, Penn., their bid being \$315,139. That firm assumed all risks, incident to such works. The tunnel was to be completed November 1, 1865.

The inaugural ceremonies attending the breaking of ground for the tunnel took place March 17, 1864. Mayor Sherman, after addressing the people present, took a pick and, breaking the ground, declared the great work commenced. The majority of the Common Council, Messrs. Letz and Rose of the Board of Public Works, City Engineer Chesbrough, Comptroller S. S. Hayes, Dewitt C. Cregier, chief engineer of the water works; Colonel James Gowan and James J. Dull, contractors; U. P. Harris, chief engineer of the Fire Department, and others, were present. Each public official took a shovelful of earth and, placing it in a wheelbarrow, transferred that vehicle to Messrs. Dull & Gowan, the contractors, thus symbolizing the fact that the undertaking had been placed in their hands. After breaking ground the shore shaft was sunk. It was originally intended to construct the shaft wholly of brick, running it down from the surface of the ground to a depth of fifteen feet below the level of the lake; but the fact that a shifting quicksand had to be passed through, compelled them to abandon that plan of operation. The contractors were, therefore, authorized to run down an iron cylinder, of the same dimensions as the center of the crib, to a depth of twenty-six feet, and to the bottom of the sand bed. This inlet cylinder was nine feet in inside diameter. It was put down in four sections of about nine feet in length. From the shore shaft the tunnel extended two miles out in a straight line, at right angles with the shore. Excavations were commenced immediately after the ground was broken. In July, 1865, the giant crib* for the east end of the tunnel was launched, in the presence of Governor Oglesby and a large concourse of citizens. After being towed out in safety, two miles from the shore, it was there sunk. With regard to the character of the work, the material met with in the process of excavation was stiff blue clay throughout, so that the anticipation of the contractors in this respect was fulfilled. The soil was found to be so uniform, that only one leakage of water through the tunnel ever occurred, and that only coming at the rate of a bucketful in five minutes. This occurred in September, 1865. From that time no accident of any importance transpired. There were two or three slight escapes of gas. The first brick was laid at the crib end on the 22d of December, 1865, and on the last day of the year the workmen began to excavate from that end, at which time they had already 4,825 feet done from the shore. From

that time the work progressed steadily and with few interruptions.

In the early part of November, 1866, when within a few feet of meeting, the workmen, for the first



EXTERIOR VIEW OF COURT-HOUSE RUINS.

time, discovered sand pockets, which caused leakage, and delayed the final blow until December 6, 1866, when the last stone was placed by Mayor J. B. Rice. A large flag floated from the cupola of the old ante-fire Court House, in which building the Board of Public Works had their office. It was in honor of the final closing up of the tunnel arch at the point where the crib and shore sections met. The Board of Public Works had previously extended invitations to the Common Council, Board of Education, and many other prominent citizens, to witness the ceremonies.

At the time fixed, about two hundred of the guests were on the spot, awaiting anxiously the rare adventure before them. The invitations stated that a number of the guests were to make a tour of the tunnel from the shore shaft to the crib, and return by the lake, on board tug-boats, while others went out to the crib first, and returned by the tunnel railroad. Thousands of people were on the spot who had not received invitations, and who, of course, could not make the interesting voyage. The Board of Public Works had managed to have two trains of cars pass through the tunnel, from the shore to the crib, one leaving the shore shaft at ten o'clock, and the other at half-past twelve; also to have a tug-boat leave State-street bridge at corresponding hours for the crib. Twenty-one earth-cars were put in readiness for the tunnel, or subaqueous, trip, and the tug-boat "S. N. Crawford" was chartered for service for the supermarine voyage. The hour for starting was ten o'clock, at which time the entire party were on hand, full of eager expectation. When the hour arrived, J. B. Rice, then mayor, the general members of the Board of Public Works, the Common Council, and as many of the guests as could ride in the first train, were lowered into the shore shaft, where they entered the cars. The Mayor took the first car, and the other members of the party arranged themselves in the train, four persons occupying a car, one sitting in each corner. As the memorial stone was to be inserted upon the south side, the passengers were seated so as to face that point of the compass. The motive power of the train was a mule, which could be dimly discerned in the gloom ahead. When all was in order, the train started off through the tube-like passage, the mule cantering along

* In the construction of the crib, 675,000 feet of lumber and 200 tons of bolts and iron fastenings were used.

at a rapid pace. At the distance of a mile and a half from shore, the exact point where the two tunneling parties met, the train stopped. The Mayor and members of the Board of Public Works left their seats and advanced to the spot. Mr. Kroschell, the city inspector, said :

"Mr. Mayor, and Members of the Common Council: You have arrived at the spot where the two ends of the work are to be closed up. It only remains for you, Mr. Mayor, to place the last stone in position in this work, and we are going to help you to do it."

Mayor Rice then came forward, and, amid the cheers of the guests, spoke as follows :

"Members of the Board of Public Works, of the Board of Aldermen, Gentlemen, Contractors, and Fellow Citizens: At the commencement of this important work, the Mayor of the city, being its chief officer, and supposed to represent the sentiments of all our citizens, was appointed to remove the first shovelful of earth, thereby introducing the work, and showing the world that the great undertaking should be done. Now that this portion of it is completed, I have the great pleasure and the honor, as Mayor of the city, in like capacity to put the last finishing stroke upon this work, which is intended, as I understand, to show the world that the citizens of Chicago, through me, give this great enterprise their approval."

His Honor then took the trowel and the stone, a perfect white block of marble one foot long by six inches wide, inscribed with the words, "Closed December 6, 1866," and deposited the key-stone in its final resting place, remarking further, as he did so :

"Now, gentlemen, in behalf of the City of Chicago, I place the last stone in this great tunnel—the wonder of America and the world."

A number of pieces of American coins were deposited inside the stone by the guests, when the Mayor continued :

"Gentlemen, I announce to you all that the last stone in this great tunnel is laid, and that the work is completed."

It was now eleven o'clock, and the party, re-entering the cars, were soon at the crib shaft, appearing somewhat blinded by the light as they ascended from beneath the lake. The party who came by the tug were already there, and many were the congratulations exchanged. In a short time the second train from the shore arrived,

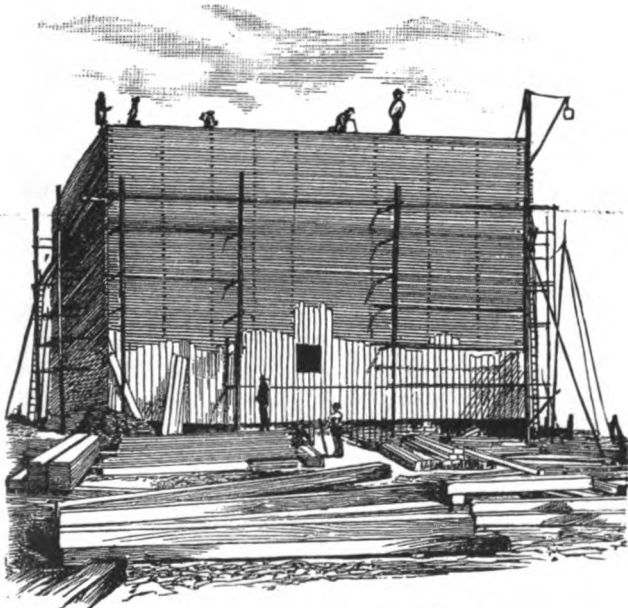
and the passengers were also elevated to the large room in the crib. At this juncture the cannons boomed, being fired simultaneously from the crib and shore. Some little time was spent in examining the wonderful structure, and then the regular order of exercises proceeded. J. G. Gindele, then president of the Board of Public Works, addressed the visitors in a brief speech. In response, Mayor Rice said :

"Members of the Board of Public Works, Aldermen of the City of Chicago, and Fellow Citizens, one and all: The remarks last made by the President of the Board of Public Works render it unnecessary for the Mayor of Chicago to speak a word; but, as I am here, I would gladly testify with such weak words as I can use, my appreciation of the wonderful work of which I have seen the completion to-day; and with heartfelt joy I stand here among you to-day—this day of gladness,—made doubly glad by the genius of man. This great work is completed. We have seen it. It is now a means of furnishing every inhabitant of the city of Chicago with pure, sweet water; and a supply in excess of the demand, sufficient for a million of inhabitants more. All honor and thanks to the men who conceived, and to the men who executed this great work. And I would congratulate the citizens of Chicago, here, that they have the healthy winds of our boundless prairies, that they have the life sustaining bread of our perfectly cultivated fields, that they have the pure refreshing water of our mighty lake, all of which tend to make Chicago the most favored of cities. I do not intend to enter into statistics as to when the tunnel was commenced, how it has progressed, how difficulties have been met with at every turn, how these difficulties have been surmounted, how men doubted at its commencement, how these doubts are forever set at rest; but I will unite with you all in saying: Hail! Chicago, metropolis of the great West, vast in her resources, fortunate in her citizens, whose genius, industry and integrity secure to us the use of all those advantages and blessings which are vouchsafed to us by the Creator and Dispenser of all the things which we have."

Addresses were also made by Aldermen Holden and Clark, and D. D. Driscoll, the corporation attorney. Mr. Chesbrough likewise made a short speech, in which he claimed that great credit and praise were due Messrs. Dull & Gowan, the contractors, upon whom the responsibility of the work rested. After partaking of a fine collation, prepared in the kitchen of the crib, the party who came by the tug started for the shore, via the tunnel railroad, and the Mayor, aldermen, etc., took passage on the tug.

The total cost of the tunnel to the city was \$464,866.05.

THE WATER WORKS.—The grounds upon which were erected the buildings of the water works of 1867, were bounded by Chicago Avenue, Pine and Pearson streets, and the lake.* They had a frontage of two hundred and eighteen feet on Pine Street, and extended from the lake westward a distance of five hundred and seventy-one feet. When, in 1863, it became evident that additional machinery would be required, in order to embrace the tunnel system, and otherwise extend the operations of the water works, it was found that the dimensions of the old building, pump-well and foundations would not admit of any such extension. Plans and specifications for a new engine, boiler, etc., were prepared early in 1864, and in July the contract was awarded to George W. Quintard, proprietor of the Morgan Iron Works, New York City. Various plans were suggested by which the new buildings required for the more extensive system could be erected, without disturbing the supply of water furnished the city by the old works. In pursuance of the plan finally adopted, the preliminary work of removing the north boiler and brick smoke-chimney, the wall of the main building, the boiler house and a portion of the water-tower of the old works, was commenced in March,



CRIB BEING BUILT.

*Most of the facts in regard to the construction of the water-works buildings are from the official reports of Dewitt C. Cregier, engineer under E. S. Chesbrough.

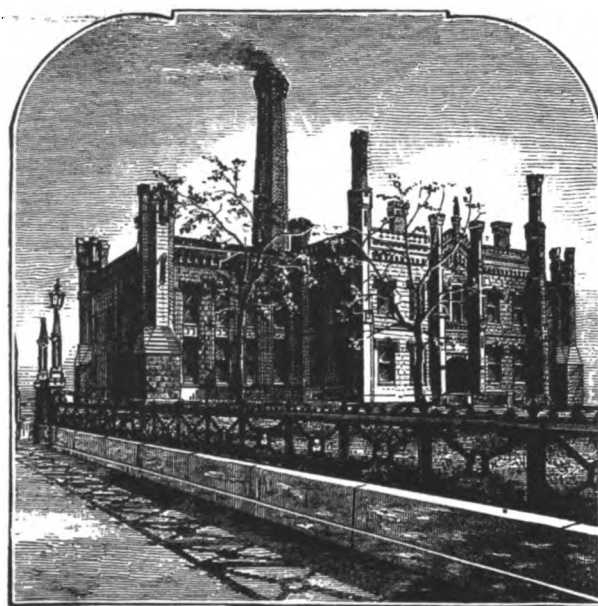
1866. Upon the site thus prepared a pump-well was sunk to the depth of twenty-one feet, being completed in March, 1867. The structure was located within a dozen feet of one of the engines then in use, and on account of the yielding nature of the soil, the work was proceeded with cautiously but successfully.

On March 25, 1867, water was first let into the tunnel. On that day the new water works were formally inaugurated by the laying of the corner-stone of a new tower, situated half a block west of the old one, and subsequently completed to a height of one hundred and thirty feet. Within this tower was to be constructed an iron column, three feet in internal diameter, to the top of which the water would be forced from the tunnel by the powerful machinery then being built. The water was thence forced by its own pressure through the mains, and to the tops of the highest buildings in the city. In consequence of the delay in completing the north wing of the main building, and the unfinished condition of the connection of the tunnel with the new pump-well, as well as the laying of the connecting mains between the engines and new water-tower, the engine was not used for some time after it was completed. On the 20th of July, 1867, the work alluded to had so far progressed as to admit water to the new pump-well, and the engines were put in operation.

The first stone for the engine foundations was set October 6, 1866, and the work completed during the following month. A new engine was now being built, in addition to the two then in use, it being constructed by George W. Quintard, proprietor of the Morgan Iron Works, New York City. The entire cost was \$112,350. It was first brought into play in July, 1867, and had a capacity of eighteen million gallons daily.

In the fall of 1867, the city commenced to erect a machine shop for the manufacturing of hydrants, stop valves, and for doing other work connected with the water system. The building was completed in February, 1868. It was two stories high, built of brick.

During the early part of 1869, the building for the new pumping works, and the beautiful water-tower, were completed. The former was erected upon the site of the old works, and owing to the care necessary to guard against accident to the water supply, operations had naturally been conducted slowly. The style of architecture was castellated Gothic, with heavy battlemented corners, executed with solid rock-faced ashlar stone and cut-stone trimmings, all the details being of a massive and permanent character. The dimensions of the engine-room were one hundred and forty-two feet long, sixty feet wide, and thirty-six feet in the clear. The central portion of the main front was divided into two stories, the upper part being devoted to draughting rooms and sleeping apartments for the engineers. The lower part was divided by the main entrance. A large reception room, engineers' offices, etc., comprised the ground floor. The roof of the main building was constructed of massive timbers, covered with slate and pierced with the necessary ventilators. Midway between the floor and ceiling, and extending around the entire interior space of the building, was a handsome gallery, from which could be viewed the operations of the engines. Below the main floor of the principal building there was a space extending over the whole area, nine feet high, in which were located the pumps, delivery mains, etc., and from which the pump-wells, connected with the lake tunnel, descended. The boiler rooms were placed nineteen feet apart, and were situated in the rear of the main building. Between the boiler rooms was the smoke-stack,



WATER-WORKS BUILDING.

which rose to a height of one hundred and thirty feet from the ground.

About one hundred feet to the west of the main building was the imposing water-tower. The exterior of the shaft was octagonal and rose one hundred and fifty-four feet from the ground to the top of the stone work, which terminate in a battlemented cornice. The whole was surmounted by an iron cupola, pierced with numerous windows, from which might be obtained a magnificent view of the lake, the city and surrounding country. The exterior of the tower was divided into five sections. The first section was forty feet square and surrounded the base of the shaft. The floor and roof of this portion was of massive stone, the latter forming a balcony. The bottom of the interior was hexagonal. Here the base-piece of the stand pipe (a casting weighing six tons) was placed, having six openings, supplying thirty-inch gates, to which the water mains were connected. From this base a thirty-six inch wrought iron stand-pipe ascended to a height of one hundred and thirty-eight feet. Around this pipe was an easy and substantial iron stairway, leading to the cupola on the top, and lighted throughout with alternating windows. The whole structure was looked upon as thoroughly fire-proof, being composed wholly of stone, brick and iron. Much credit was justly accorded to W. W. Boyington, the architect of the buildings, for the professional skill, taste and judgment displayed in the work entrusted to him.

The year 1869, then, marks the virtual establishment of the second system of Water Works, although it has since been extended to such magnificent proportions, to keep pace with the wonderful growth of the city, that the fine accomplishments of the past are lost sight of in the splendid achievements of the later period. Up to March 31, 1869, the cost of the water system, including all expenditures for works then in progress had been \$3,146,383.14; this expenditure having been met by the issuing of over two million and a half in bonds, and by water rents. During the year 1868-69 thirty and a half miles of water pipe were laid, making over two hundred and eight miles then in use. Even then the extent of pipes laid exceeded that of any cities except New York, Brooklyn and Philadelphia. One important improve-

ment suggested at this time, and subsequently carried out, in order to meet an insufficient supply of water, was an extension of the system of two-foot mains around the three divisions of the city, making, in fact, a continuous main of about thirteen miles in length.

In October, 1869, the plans and estimates for the establishment of the West-side water works, on the corner of Twenty-second Street and Ashland Avenue, were submitted to the City Council. But as they were not completed until six years thereafter, a history of this important extension of the water service must be deferred to the third volume.

During 1870-71, the tunnels under the canal and river at Division Street, and under the river at Chicago Avenue, and at Adams Street, to accommodate the water mains passing to the West Division of the city, at these points, and the tunnel under the South Fork of the South Branch at Archer Avenue, for the water main passing to the southwestern portion of the city, were all completed and put in use. The grounds at the water works were fenced and preparations made to beautify them. A fourth engine, constructed in Pittsburgh, of thirty-six million gallons daily capacity, was also in place at the works and nearly ready for use. It was designed to increase the combined capacity to seventy-one million gallons.

The great fire of 1871 swept away most of the buildings connected with the pumping works, damaging the machinery so badly that the water supply (and therefore all means of checking the conflagration) was cut off. The loss on buildings and machinery was about \$75,000. The machine shop connected with the works, including much valuable machinery was almost a total loss, while the damage to the North and South Side reservoirs was some \$20,000, and nearly three miles of water-service pipe were melted or otherwise injured. The total damage to the water works system was \$248,910.

While the three engines were disabled, a partial supply of water was furnished some sections of the city by pumping into the pipes from the river, at different points, and by making connections with wells at the corner of Western and Chicago avenues, at Wahl's glue factory, at the Northwestern Distillery and at Lincoln Park. Many of the inhabitants living in the vicinity of Union and Jefferson parks obtained their supply from the artificial lakes, thus preventing much threatened distress. The damage to the engine house was repaired, the machine shop reconstructed upon the old foundation, and the engines so promptly put in working order that the one of 1867 was running October 17, 1871; that of 1857 on November 10, and that of 1853 on the 30th of November.

The following table shows the amount of assessments for the maintenance of the water system made by the Board of Public Works since it was created, in 1861, up to the time of the fire—the fiscal periods end with April 1 for the years specified :

1862	\$12,635 49
1863	46,493 67
1864	389,169 31
1865	103,576 35
1866	802,574 56
1867	317,206 18
1868	1,354,436 48
1869	2,395,683 03
1870	2,836,852 48
1871	2,359,835 89

Total..... \$10,648,463 44

The following table will show the great strides

which Chicago has made in the development of her water system from 1858 to 1871, inclusive, the period covered by this volume :

YEAR.	Daily Supply Gallons.	Estimate made in 1851, based on 35 gals. per inhabitant.	Capacity of Works.	Revenue.	Miles of pipe laid.	Miles of pipe in use.
1858	2,991,413	2,340,000	20,000,000	\$102,179		72.4
1859	3,877,119	2,520,000	20,000,000	122,948	12.7	85.1
1860	4,703,525	2,700,000	20,000,000	131,162	5.9	91.0
1861	4,841,520	2,880,000	20,000,000	150,290	4.3	95.3
1862	6,074,739	3,060,000	20,000,000	150,920	9.6	104.9
1863	6,400,298	3,240,000	20,000,000	190,886	10.5	115.4
1864	6,913,259	3,420,000	20,000,000	224,246	11.9	127.3
1865	7,610,459	3,600,000	20,000,000	252,441	13.9	141.2
1866	8,681,536	3,780,000	20,000,000	301,124	11.0	152.2
1867	11,562,273	3,960,000	20,000,000	337,468	22.6	174.8
1868	14,724,999	4,140,000	38,000,000	420,656	33.8	208.6
1869	18,633,278	4,320,000	38,000,000	476,968	31.3	239.9
1870	21,766,260	4,536,000	38,000,000	539,318	32.5	272.4
1871	23,464,877	4,752,000	38,000,000	446,265	15.3	287.7

RIVER, HARBOR AND MARINE.

HARBOR AND RIVER IMPROVEMENTS.—The location of the streets of the city, the course of the river and the condition of the sand-bars at the beginning of 1858, varied but little from descriptions given in the first volume of this history. The charts made between 1854 and 1858 by S. S. Greely show the former position of Fort Dearborn, the ancient river bed, the sand-bar at its mouth and the grounds and the buildings of the Illinois Central Railroad Company. The distance from the east line of Michigan Avenue, at Randolph Street, to the shore of Lake Michigan (according to the plat of the Fort Dearborn Addition to Chicago) is given at about seventy-five feet. The distance from the same point to the shore line, as laid down by Surveyor John Wall, in 1821, was one hundred and seventy-five feet, continuing northeasterly to a point at the intersection of St. Clair and Illinois streets. In 1836 the west line of the sand-bar was one hundred and fifty feet east of the line of 1821. In the map of 1858 a large area of "made land" is shown on the lake side of the sand-bar. West of "Slip A" was the Illinois Central freight house. Between this building and the old channel of the river was the Michigan Central freight house, and west of it was a second structure of a like character. South of the latter freight house was the passenger depot belonging to the Illinois Central Railroad Company, while, standing on the southeast corner of Michigan Avenue and River Street, was the old United States Marine Hospital, sold in 1864. Diagonally across from the Marine Hospital was the block house and two small buildings belonging to Fort Dearborn. The south building, or officers' quarters, stood on what is now River Street, nearly at the foot of Rush-street bridge; while the north building stood on land, which was subsequently excavated, and now forms the south channel at that point. The light-house stood on the river bank, just west of Rush-street bridge. The above particulars are given that the general reader may obtain an idea of the appearance of the harbor, the river's mouth, and the surrounding country in the year 1858.

The Government seemed still loath to recognize Chicago's importance as a commercial emporium, even by so much as making a modest appropriation by which her decaying harbor piers could be kept in repair. The city herself therefore took up the matter, trusting to the future for re-imbusement. In the fall of 1859 a