

FIFTH ANNUAL REPORT

OF THE

BOARD OF COMMISSIONERS

OF THE

CENTRAL PARK.

1862.

Amer. Geographical and Statistical Society.

From Andrew H. Green
Donation

June 18th 1868. No. 19.

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BOARD OF COMMISSIONERS

OF THE

CENTRAL PARK.

JANUARY, 1862.

AMERICAN
GEOGRAPHICAL
SOCIETY.

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Board of Commissioners of the Central Park.

OFFICERS AND COMMITTEES,

MAY, 1862.

CHARLES H. RUSSELL,
J. F. BUTTERWORTH,
WALDO HUTCHINS,
THOMAS C. FIELDS,

ANDREW H. GREEN,
HENRY G. STEBBINS,
R. M. BLATCHFORD,
M. H. GRINNELL.

President.

R. M. BLATCHFORD.

Treasurer and Comptroller.

ANDREW H. GREEN.

Vice-President.

HENRY G. STEBBINS.

Secretary.

THOMAS C. FIELDS.

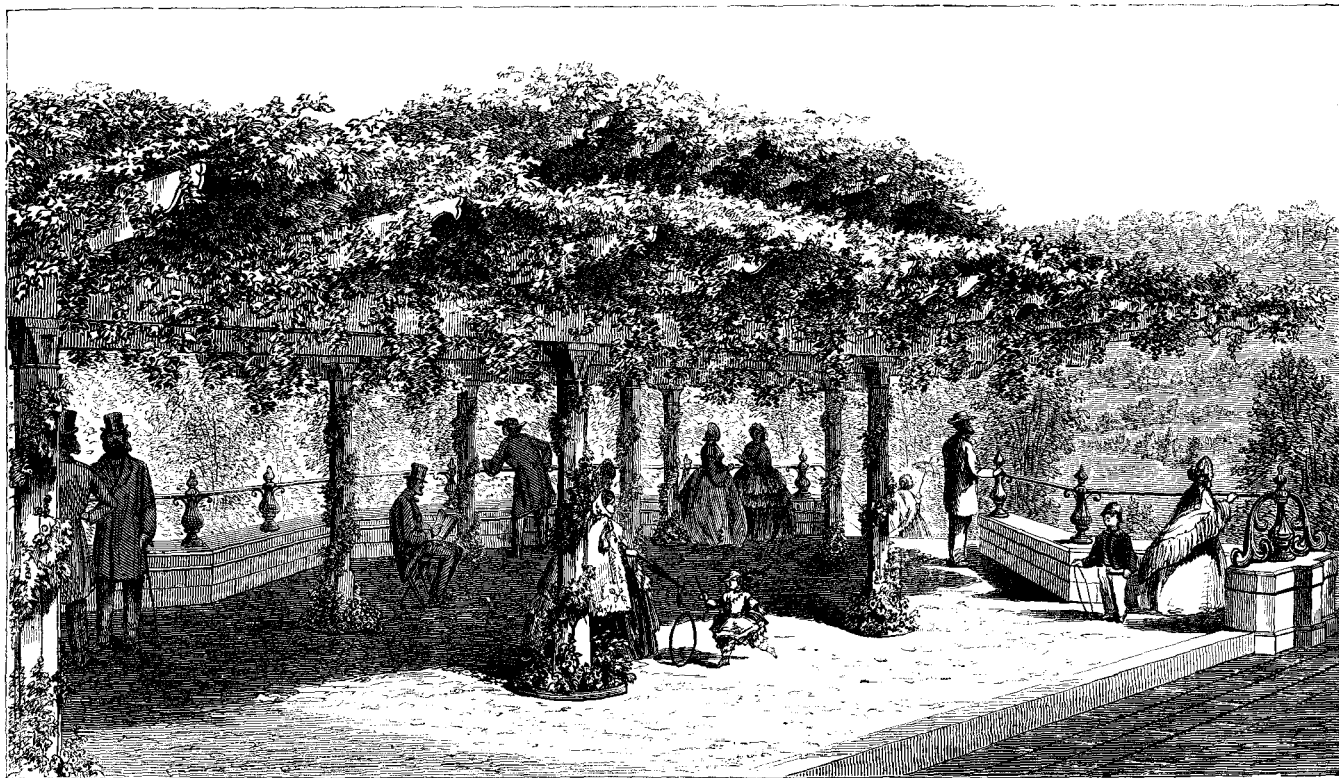
Finance.—Messrs. RUSSELL, GRINNELL, BUTTERWORTH.

Executive.—Messrs. GRINNELL, STEBBINS, GREEN, HUTCHINS, RUSSELL.

Auditing.—Messrs. STEBBINS, GRINNELL, FIELDS.

By-Laws and Ordinances.—Messrs. HUTCHINS, FIELDS, GREEN.

Statuary, Fountains, and Architectural Structures.—Messrs. STEBBINS,
RUSSELL, BUTTERWORTH.



VINE-COVERED WALK OVERLOOKING THE MALL.

REPORT.

*To the Honorable the Common Council
of the City of New York :*

The Board of Commissioners of the Central Park has the honor to present to your Honorable Body, this, its report for the year ending with the 31st day of December, 1861.

During this memorable period, when the general disturbance of the regular pursuits of industry suddenly deprived many persons of the employment by which they were accustomed to gain a subsistence, the eccentric movements of commercial and monetary affairs rendered it somewhat difficult to determine upon the proper measures to be adopted in the conduct of a work, usually affording employment to large numbers of men.

The Board, at the opening of the year, was clear in its general view of the expediency of reducing the amount of its expenditures, while, at the same time, it was apparent that the condition of the work was such as to render its suspension inadmissible.

On one hand it was urged that the general stagnation in business affairs rendered it wise to extend public improvements, in order that occupation might be afforded

to those unemployed ; and, on the other, that public improvements should be suspended, in order that the surplus means of the community might be directed to the advancement of those measures necessary to establish the authority of the Government throughout the Union.

Giving these conflicting views due consideration, the Commissioners of the Park took measures to diminish their expenditures, and, at the same time, to retain such of the employees as were needed to finish structures requiring completion, to prevent their being damaged by the action of the weather, and to open to the public use further portions of the Park then unfrequented.

This policy has been so generally carried out by the Board as to admit of much of the force being gradually absorbed in other vocations, and so effectually as to produce the following results :

The total expenditures for construction, for	
the year 1860, were	\$873,354 95
The total expenditures for construction, for	
the year 1861, were	479,163 66
	<hr/>
Diminution of expenditures,	<u>\$394,191 29</u>
Total number of working days for the year,	260
Average number of working days per month,	21
Total number of mechanics, laborers, carts,	
teams, masons, stone-cutters, carpenters,	

blacksmiths, &c., employed during the year	
1860, was	3,579
Total during the year 1861, about	1,500
	<hr/>
Decrease,	2,079
	<hr/>
The largest force engaged at any one time (exclusive of men employed by contractors),	
during the year 1860, was	2,506
The largest force engaged during 1861 was	1,224
	<hr/>
Decrease,	1,282
	<hr/>
The average force per day for year 1860 was	1,528
“ “ “ 1861 “	950
	<hr/>
Decrease,	578
	<hr/>
The average force employed by contractors,	
during the year 1860, was,	200
The average force during 1861, was,	300
	<hr/>
Increase,	100
	<hr/>
Average number of foremen, for the year 1860,	
was,	46
Average number for year 1861,	30
	<hr/>
Decrease,	16
	<hr/>
Average number of assistant foremen, for the	
year 1860, was,	32
Average number for year 1861,	18
	<hr/>
Decrease	14

The Board of Supervisors, at a period when the year was well advanced, addressed the Commissioners of the Park a communication covering a preamble and resolution, adopted by that Board at a meeting on the 24th of April, relative to suspending the work at the Park. A copy of this preamble and resolution, with the reply of this Board thereto, and subsequent resolutions of the Board of Supervisors, are given in an appendix to this report, marked A.

In view of the existing state of public affairs, and the advanced condition of the Park, the Board deem it the wiser course to spread its expenditures for construction over a longer period of time than has been heretofore intended. The annual demand for money will be thus diminished, and the work will be quite as economically accomplished.

The following is a statement showing the aggregate quantities of work done, and materials furnished, during the past year, including contract work:

5,270	cubic yards	rock excavation,	by Park force.
142,500	"	"	earth excavation and filling by Park force.
57,520	cubic yards	earth, soil, and stone filling,	by contract (obtained from sources exterior to the Park).
323,400	cubic yards	rock and earth excavation and fill- ing,	by contract.
4,660	cubic yards	stone and brick masonry	in bridges.
2,180	"	"	masonry in transverse road walls.

- 1,090 cubic yards brick and stone masonry in sewers, silt-basins, and other structures.
- 3,230 lineal feet, brick sewers.
- 26,220 " " vitrified and hydraulic cement pipes and common tiles, in road, walk, and bridge drainage.
- 465 silt and surface basins, for road and walk drainage, and stop-cocks.
- 21,709 superficial feet asphaltum on bridges.
- 25,075 lineal feet iron and cement water-pipe laid.
- 232 hydrants set.
- 17 stop-cocks set.
- 169 branches inserted.
- 1 drinking hydrant set.
- 79 acres of ground fertilized, and mainly seeded.
- 8,000 cubic yards manure (compost) used.
- 25,120 lineal feet drain tiles laid, agricultural drainage.
- 1,300 lineal feet stone drains laid, agricultural drainage.
- 52,743 trees and shrubs of all kinds planted.

MATERIALS PURCHASED OR FURNISHED UNDER CONTRACTS.

- 897,170 common hard and Philadelphia brick.
- 3,519 barrels cement.
- 21,575 cubic yards gravel.
- 1,754 " " sand.

- 6,400 lineal feet vitrified pipes.
- 11,457 " " hydraulic cement pipes.
- 8 tons of powder.
- 15,811 lineal feet curb and gutter-stones, for road purposes.
- 1,674 cubic yards granite, graywacke, gneiss, Belleville and Dorchester stone, for bridges, &c.
- 23,200 trees and shrubs of all kinds.

The aggregate quantities of work done since the commencement of the Park, up to January 1st, 1862, are as follows :

- 1,992,000 cubic yards earthwork, materials excavated and removed.
- 288,380 cubic yards rock excavation.
- 69,480 " " masonry of all kinds.
- 20,730 feet length of brick sewers.
- 35,000 cubic yards stone broken for roads and concrete.
- 18,184 cubic yards sand furnished for masonry.
- 165 tons of powder furnished for blasting.
- 45,075 cubic yards gravel, furnished for roads and walks.
- 86,308 trees and shrubs of all kinds planted.
- 4,835,720 brick furnished in 1859, 1860, 1861.
- 33,142 barrels cement furnished in 1859, 1860, 1861.
- 206,115 feet of drain tile laid.
- 8,133 " " stone drains laid.
- 71,244 " " iron and cement water-pipe laid.

466 hydrants set.

64 stop-cocks set.

589 branches inserted.

Five urinals of different designs have been erected, and the number will be increased during the coming year.

During the past year, Bridges Nos. 7, 9, 14, and 16, commenced last year, have been completed, or nearly so.

Bridges Nos. 17, 19, and H, have been commenced and completed, or nearly so, this year.

The number of evergreen trees and shrubs planted

in 1861, is 9,710

The number of deciduous trees, shrubs, and vines

planted in 1861, is 43,033

Total number planted in 1861 . 52,743

Of these, 19,542 were from the nurseries of the Park.

The Park is to be supplied with water taken from the Croton mains, and distributed by a system entirely independent of that of the Croton Board.

This system, mainly completed, is composed of more than ten miles of iron and cement water-pipe, with nearly five hundred hydrants, from which, by means of hose, water can be spread over the whole surface of the Park, and the lawns, foliage, and roads effectually irrigated.

The completion of the new Croton main across the High Bridge will hereafter furnish a steady supply of water for the Park, and enable the Board to increase the number of drinking hydrants, which are much required.

The Terrace, the main architectural structure of the Park, is well advanced and already serves the objects for which it was designed.

The general use of this and the other archways of the Park demonstrates their utility, as an additional provision against accidents.

The system of agricultural tile drainage has been continued, with some improvements. About five miles of this drainage was laid during the year.

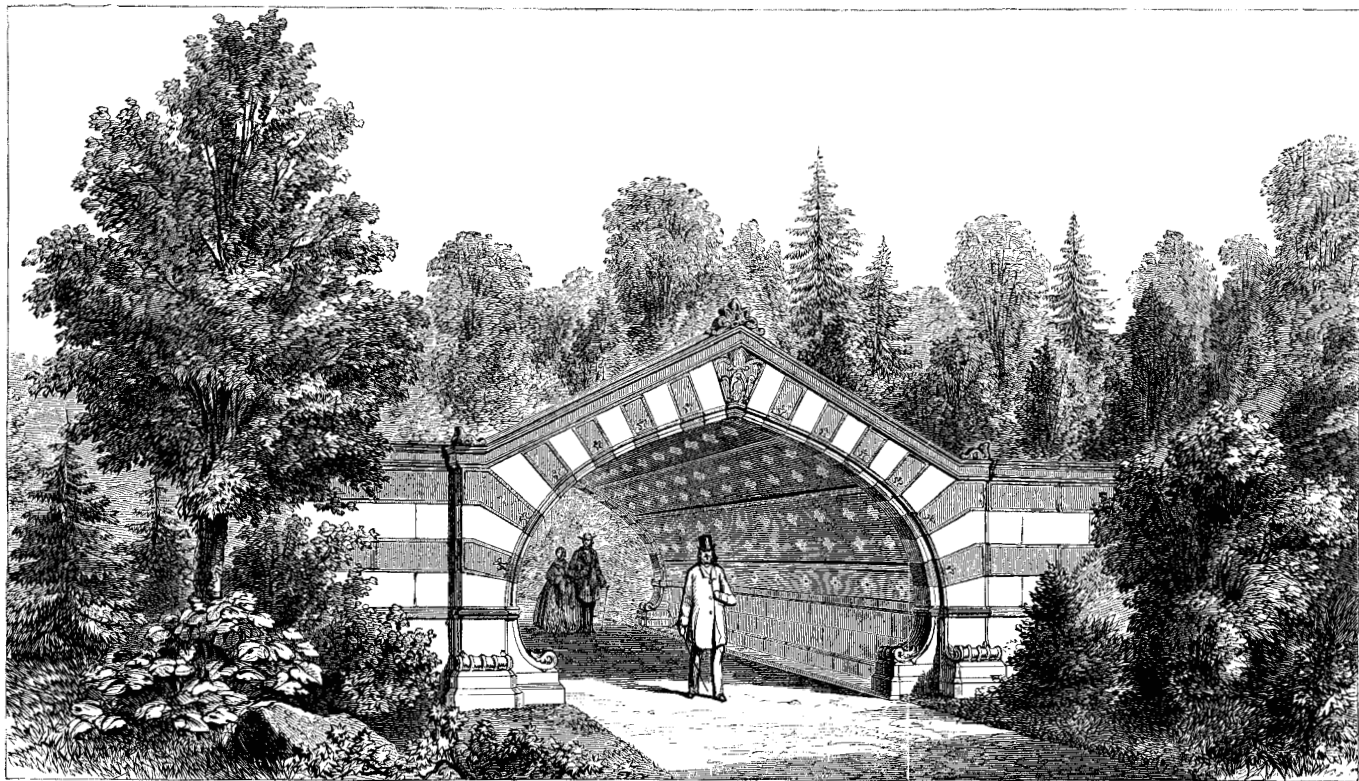
Gas-pipe has been, by permission of the Board, laid through Transverse Road No. 1, from Sixty-fifth street, on the Fifth avenue, to Sixty-sixth street, on the Eighth avenue, by the Manhattan Gas-Light Company, to connect its system with the east side of the city. This road is now open for passage across the Park.

The Croton Aqueduct Board, by consent of this Board, is engaged in laying a main pipe through Transverse Road No. 2, to the Eighth avenue, for water distribution to the west side of the city from the grand Reservoir.

This work will soon be completed, and the road put in order for public use.

The utility of these transverse roads for these purposes, foreign to the main objects for which they were designed, has gone far in compensating for the outlay in their construction.

The Board has during the past year authorized the Croton Aqueduct Board to lay mains from the north gate-house of the grand Reservoir to the Eighth avenue, at about Ninety-ninth street, and to the Fifth avenue, at about Ninety-seventh street, to supply the system of



ARCHWAY UNDER DRIVE. FOR FOOT-PATH NORTHEAST OF THE RAMBLE.

water distribution for the north part of the city, as well as the laying of mains from the south gate-house to the Fifth avenue; and the laying of two sewers, to facilitate the cleaning of these mains, has also been authorized.

On the 16th of December, a further portion of carriage road was opened to the public; more than seven miles of the Drive of the Park are now in constant use.

The only portion of the Drive below One Hundred and Second street not yet opened, is from Transverse Road No. 4, at Ninety-seventh street, to Transverse Road No. 3, at Eighty-fifth street, on the east side of the Park.

This has been deferred by reason of operations connected with the grand Reservoir, a work now rapidly approaching completion, which, with the arrangement of the Park grounds in its vicinity, effected by a common purpose between the Water Board and that of the Park, will become a most commanding and attractive portion of the artistic design of the Park.

The plan of the ground about the Reservoir contemplates the arrangement of the rim or top of the bank as a level walk.

Outside of this promenade is laid the Bridle road, thirty feet in width, sometimes rising, so that the horseman overlooks the broad expanse of water, and then descending amid the foliage below.

The carriage road, still further removed from the water, is constructed with a similar design.

Adequate opportunity will thus be afforded for all classes of visitors to observe the extent of this important public work.

The contract with Messrs. Fairchild, Walker & Co. for constructing a portion of this work, has been extended to April 1st, next, the main portion of it being, however, already complete.

Although there are occasions when, in the course of an afternoon, more than three thousand carriages enter the gates of the Park, sufficient to form a continuous procession of more than seven miles in length, there is yet no completed roadway by which these vehicles can reach the Park gates, without subjecting their inmates to a suffocating dust in dry weather, and deep mud in wet—annoyances which, moreover, are quite as intolerable to those on foot.

The disturbance of streets leading to the Park, for sewerage, for laying water and gas-pipes, and for paving, will not admit of their comfortable use for probably two years, unless prompt action is taken in the premises.

The convenience of the public, as well those who walk as those who drive and ride, requires that the Fifth avenue should be paved to the Park, and that adequate means be provided for suppressing the dust of the adjacent streets and avenues, which is swept into the Park with each gust of wind, choking and fouling the foliage and verdure.

In January of 1859, the Board called the attention of your Honorable Body to the necessity of a sewer from near the corner of Fifty-ninth street and Fifth avenue, to take the drainage of the pond in that vicinity. The subject was again referred to in the Annual Report of December 31st, 1860.

Imperatively important as this sewer is, unexpected circumstances have arisen to delay its commencement. A large area of the Park is liable to damage, for want of this sewer, in case the rude culverts laid under the streets crossing the original water-courses should by any means become clogged—a contingency that becomes every year more probable.

The drainage of that portion of the Park opposite the space from Seventy-second to Eighty-sixth streets, and of a large piece of land west of the Park, including Manhattan Square, and its vicinity, finds its natural outlet from the Park on the east, near Seventy-fourth street.

The water-way has become clogged by the late filling at Fourth avenue, causing the water, after heavy rains, to set back over several acres of land.

A sewer is required through Seventy-fourth street, from Fifth avenue, to take the water to the East River.

These sewers are essential to the Park as well as to a large area of outside land in the vicinity of Manhattan Square, now subject to overflow.

This neighborhood is rapidly becoming settled, and its salubrity requires the means of effectual drainage.

A small amount of filling on Manhattan Square, the property of the city, would confine the back water within a very small area, and afford a partial temporary relief, and much subserve the comfort and health of the neighboring residents.

The broad walk at the south end of the Park, along Fifty-ninth street, has been graded, graveled, and partially planted with fine maple trees.

This expensive improvement, as well as the widening of the carriage-way of Fifty-ninth street, seemed demanded at this concentration of the approaches to the Park from the city.

The necessary open area in connection with the carriage entrance at Fifty-ninth street and Fifth avenue has been arranged so as to avoid, as far as practicable, the risk of accidents to pedestrians crossing the streets in this vicinity.

Of the Park, little remains to be done below Seventy-second street, except the enclosing fence and the construction of appropriate gateways.

A piece of wall in the style proposed for the Park enclosure has been erected on Fifty-ninth street, near the Sixth avenue entrance.

The work of enclosing the lower portion of the Park, will, it is hoped, be commenced early in the coming year, though the style of enclosure that will be adopted has not yet been determined.

The excavation of a small lake or pool, and the treatment of the adjacent ground in the vicinity of One Hundred and Second street and Eighth avenue, has been deferred, as its form and location are somewhat dependent upon the addition to the Park, of the land between One Hundred and Sixth and One Hundred and Tenth streets.

That this addition is desirable, no one can doubt, who has observed the topography of the neighboring country.

Convinced of its necessity, the Board recommended, in the year 1859, to the State and city, the necessary

legislation for its accomplishment. Under a law authorizing the taking of the land, the Board instituted proceedings to acquire it.

The Supreme Court appointed commissioners to value the land, whose report was not made until the expiration of nearly a year and a half after their appointment. The amount of their valuation, to wit, the sum of \$1,499,438, was so far beyond the expectation of the Board when the annexation was recommended, that it felt called upon to discontinue the proceedings. Though the delay occasioned embarrassment to the work, and in completing the plans of the Board, yet the duty of this discontinuance seemed evident.

Allusion was made in a former report to the extraordinary claim for costs of conducting these proceedings (as originally submitted by the commissioners appointed by the Supreme Court, amounting to \$73,335 52.) Having become the subject of litigation, they were referred by the Court to the Hon. John B. Haskin, from whose opinion, on file in the office of the County clerk, it appears that he is of opinion that the prices and amounts contained in the taxed bill of costs "are extravagant and unreasonable, and especially the items for commissioners', clerks', and surveyors' charges, and also the charge for room rent, &c., and that this Court should make an order, vacating, annulling, and setting aside said bill of costs, and every part and parcel thereof."

By an order, filed on the 13th day of December last, the report of the referee was, with a few modifications, confirmed by his Honor Judge Barnard.

The following statement shows some facts of interest respecting these costs :

	Amount originally claimed and submitted by the Supreme Court Commissioners.	Amount subsequently submitted and audited by Supreme Court Commissioners and al- lowed by the County Clerk.	Amount allowed by The Referee.	Amount allowed by the Court.
Surveying	\$49,397 89	\$32,973 00	\$10,025 00	\$10,425 00
Commissioners' fees.	4,884 00	4,884 00	4,788 00	4,788 00
Clerks' salaries, &c.	6,588 00	5,628 00	5,178 00	5,178 00
Counsel.	5,375 00	5,375 00	5,375 00	5,375 00
Rent and expenses.	3,680 00	2,889 00	1,612 00	1,612 00
Advertising.	1,442 63	1,442 63	1,442 63	1,442 00
Stationery.	1,090 00	1,082 43	1,082 43	1,082 43
Appraiser.	500 00	150 00	150 00	150 00
Posting notices.	228 00	228 00	228 00	228 00
Livery.	150 00	36 00	36 00	36 00
Totals	\$73,335 52	\$54,688 06	\$29,917 06	\$30,316 43

The amount allowed by the Court is \$43,019.10% less than the original sum claimed.

A copy of the costs and expenses of the Commissioners in this matter, as found on file in the office of the County clerk, is hereto appended and marked B.

These proceedings, and the claim for costs thereof, being thus disposed of, the Board seeing no sufficient reason to change its previously expressed opinions on the subject of annexing this land to the Park at a reasonable valuation, has authorized the commencement of new proceedings for its accomplishment.

To omit to take it would be to deprive the Park of a feature of great beauty that naturally belongs to it, and nothing but a conviction that the city is to cease in its growth and prosperity could justify the omission to se-

cure it, while it can be done within a justifiable expenditure.

Though it is true the existing national troubles have already had their influence on the commerce of this city, and may still further check its growth and prosperity, yet the history of the great modern cities of Europe shows a continued increase in population, in spite of domestic rebellions and foreign wars.

London had, in 1851, a population of 2,362,236; in 1811 it had but 958,863, showing an increase, in forty years, of 1,403,373.

The population of London doubled in the forty years, from 1801 to 1841, and shows about the same rate of increase since that time.

The population of Paris in 1817 was . . .	715,000
The population of Paris in 1851 was . . .	1,023,262
<hr/>	
An increase, in thirty-four years, of . . .	308,262

At the same rate of increase, the population of Paris would double in about seventy years. During the time comprised within the above limits, both England and France have passed through protracted foreign wars, and the latter city has been occupied by its enemy, and the scene of repeated domestic strife. Both of these cities flourished, especially during the severe taxation for the conduct of their foreign campaigns.

In the year 1810, New York had	96,393
And in 1850	515,394
	<hr/>
An increase, in forty years, of	419,001

The man is now living who has seen the population of this city less than 23,000, and the fathers of living men have seen it less than 10,000.

In the short period of three generations, it has increased from 4,302 to 814,254, as shown by the census of 1860.

Since the commencement of this century, the population of the city has doubled within about each fifteen years.

In modern times, though war and pestilence temporarily retard the growth of cities, they seem, if possessed of the natural elements of growth, to advance steadily in the face of these adversities.

Looking at the natural advantages of its location, and the means of communicating with the interior, that skill has devised and capital and industry have completed, who can doubt that it is to advance in population, wealth, and power? to become still more marked by the centre of the capital and commerce of the Continent, and the seat of literature and art?

Its prosperity may be interrupted for a time, but those great works that render it the convenient abode of masses of men, and attract to its shores the industry and capital that determine its metropolitan character, should, in anticipation of its brilliant future, not only not be abandoned, but should be steadily prosecuted.

The great improvements of this city have generally, if not always, been conceived on a scale far too limited; their inadequacy is developed before they have served a single generation.

The scientific and literary advantages, the great public works, the conveniences of living, and the opportunities for the cultivation and gratification of the taste that are found in the libraries, museums, and galleries of art, botanical and zoological gardens, and the magnificent buildings of the populous centres of Europe, are a constant source of interest and attraction to strangers, and at the same time afford a continual stream of revenue to their people.

The attractions of this city, of a similar character, have never been relatively equal to its position among the most populous cities of the world.

The salubrity of its climate, the Park, the Croton water, clean streets, its literary and scientific collections, should attract to this city large numbers of visitors from every part of the country, who will, while here, purchase their supplies, and each contribute to increase the business of various classes of our people.

To these advantages of the Park, as one of the ornaments of the city, add those it affords as a place of healthful exercise, amusement, and instruction for our own population, and we need look no further for a ten-fold remuneration for all the outlay in its establishment.

The assessed value of the three wards surrounding the Park, for six years, is shown in the following table :

	1856.	1857.	1858.	1859.	1860.	1861.
12th Ward.....	\$8,149,360	\$8,184,013	\$8,476,790	\$10,062,725	\$11,857,114	\$12,454,375
19th "	8,041,183	8,558,624	10,971,775	12,621,894	16,880,472	16,986,152
22d "	10,239,022	10,489,454	11,553,506	13,261,025	14,775,440	17,665,866
Total.....	\$26,429,565	\$27,182,091	\$31,002,071	\$35,945,644	\$43,463,096	\$47,106,393
					\$47,106,393	
					26,429,565	

Total increased valuation on the three wards,

1856 to 1861, \$20,676,828

The rate of tax for the year 1861 is 2.00 $\frac{1}{100}$, yielding,
on the increased valuation, an increased tax of \$413,910
81.

The total expenditures for construction

from May 1, 1857, to Jan. 1, 1862, is \$3,131,070 35

The actual cost of the land of the Park

to the city is 3,788,751 37

Showing the total cost of the Park, up

to this time to be \$6,919,821 72

The annual interest on the cost of the

land and improvements of the Park up

to this time, at six per cent., is 415,189 30

Or about fifty cents for each person of the population
of the city.

(Of the above-mentioned stock, \$399,300 was issued
at five per cent.)

The New York Historical Society has communicated to
the Board its desire, with the view of increasing the fa-
cilities of the Park for popular gratification and instruc-
tion, to find accommodations on the Park for a valuable

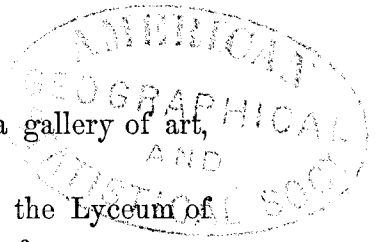
museum of antiquities and science, and a gallery of art, now the property of the Society.

Another scientific and literary society, the Lyceum of Natural History, also expressed a wish for permanent accommodations within the Park.

Possessed of a very extensive and valuable collection of minerals and geological specimens, fossils, fishes, birds, and serpents, and a large herbarium, this society, of long standing, and numbering among its members many gentlemen of wide scientific reputation, would undoubtedly be made the custodian of extensive and valuable private cabinets, were a permanent and safe deposit provided for them.

The charter and organization of the New York Historical Society are such as to indicate its peculiar fitness as a nucleus for collections of art and science, perhaps on a plan somewhat similar to that of the British Museum, which took its origin more than a century since in the favorable offer of a collection of books and specimens of natural history.

The high reputation of the Historical Society leads the Board to believe that the establishment proposed, will, under its auspices, be conducted satisfactorily to the public, add greatly to the attractions and utility of the Park, and eventually become the great national institution of art, of science, and of literature. These three departments, naturally distinct and well defined, may be all conducted under one competent head, and can only grow to the highest usefulness and magnitude within the limits of a great city.



The Board has therefore readily concurred in an application to the Legislature for authority to establish the museum and gallery proposed, upon condition that the Board shall be at no expense in the erection or preparation of the necessary buildings.

Mrs. Crawford kindly intimated her willingness to present to the Board the collection of casts of all of the works of the late Thomas Crawford.

The Board did not hesitate to accept a donation of so much interest to the countrymen of the late gifted artist.

The casts were shipped from Leghorn, and are now in the possession of the Board.

Mrs. Crawford has attached to the presentation of this collection the condition, that some suitable place be appropriated for them, and that the works be kept together in perpetuity, that fitting care be taken to protect them from injury, and that if at any future time her children should wish for a duplicate of one or more of the statues, the liberty to have a mould made for that purpose may be freely accorded to them.

A complete list of these statues, bas-reliefs, and sketches, is given in another part of this report.

It is very desirable that this collection, as that in the Thorwaldsen Museum at Copenhagen, should not be separated, as each furnishes a connecting link for the history of a true artist's development.

The Board desires to encourage, under proper organizations, the establishment, within the Park, of collections of art and science, of botanical and zoological gardens, that combine instruction with amusement. But in giving

encouragement to any such institution, not only its object must be approved, but its sound organization and undoubted ability to command the means necessary to accomplish its purposes, according to a high standard of excellence, must be first demonstrated.

The Special Committee of the Senate, appointed at the session of 1860 to investigate the affairs of the Central Park, by Hon. Robert Campbell, Lieut.-Governor of the State, and President of the Senate, consisting of the Hon. John McLeod Murphy, widely known as an engineer of skill and experience, Hon. Allen Munroe, an experienced merchant and banker, and Hon. Francis M. Rotch, a Vice-President of the New York State Agricultural Society, and a well-known agriculturist, made their unanimous report to the Senate, of the results of their examination, at its session in 1861.

The Board can but be gratified that, after a protracted investigation, these gentlemen, so peculiarly competent and qualified to examine with intelligent discrimination the various branches of the Park operations, whether in the bureau or in the field, were able to state such conclusions, with respect to this great work, as to commend its management to the almost unanimous approbation of the Legislature of the State.



RUSTIC FRAME FOR PARK REGULATIONS.

MAINTENANCE.

The act of March 19th, 1860, authorized the Board to transmit to the Board of Supervisors an estimate of the amount of money, not exceeding \$150,000 for any one year, that will be required for the maintenance and government of the Park, and provided for the collection of the amount of such estimate.

Under this law the Board have estimated as follows, to wit:

For the portion of the year after the passage	
of the said act, ending Dec. 31st, 1860,	\$80,000 00
For the year ending with Dec. 31st, 1861,	114,000 00

Making a total, for one year eight months	
and eleven days, of	\$194,000 00
Or \$106,000 less than the amount allowed by law.	

It is incorrect to suppose that the expenses of maintenance are in the same proportion to the whole sum authorized as the finished portion of the surface of the Park bears to its whole area.

Some classes of expenses are now quite as large as they will be when the Park is complete. With each year the earth works become more compact, less liable to damage by settling and washing, and therefore less expensive to keep in order.

The Park is now about as thoroughly patrolled through its whole extent as though it were finished. Gate-keepers are required at temporary openings into the Park, the necessity for the employment of whom will be obviated so soon as the inclosure of the Park is completed. In some particulars, the expense of keeping the Park will decrease when it is completed; but it is not yet practicable to state with certainty that the amount required for its maintenance will be much less than the full sum authorized.

The ordinance, fixing the hours during which the Park is to be kept open, was passed with a view of affording the widest practicable convenience to the public.

It is not improbable that these hours may be somewhat modified when the Park shall be provided with an effectual inclosure. For a considerable time to come it may be found consistent with the public convenience to close certain of the gates after night-fall.

Statistics which have been gathered during the past year, and which are approximately correct, exhibit the number of visitors to the Park for the year, and the number of visitors during each hour at which it is open for the past four months of the year. When the inclosure is complete, these statistics can be given with greater accuracy.

The following table gives the NUMBER OF VISITORS at the Park during each Month in the Year :

MONTHS.	PEDESTRIANS.	EQUESTRIANS.	VEHICLES.
January	600,007	1,094	18,540
February	265,185	2,075	37,022
March	43,349	3,575	20,906
April	60,674	9,110	27,683
May	110,761	6,708	43,586
June	110,511	5,809	47,655
July	91,076	6,994	35,648
August	134,671	4,800	37,120
September	173,003	7,071	49,624
October	118,862	10,890	58,561
November	70,789	8,608	43,226
December	84,375	6,713	48,278
Total for the year, . . .	1,863,263	73,547	467,849

Allowing the average of two persons to each vehicle, the total number will be 2,404,659, or more than three times the number of the people of the city.

The following table gives the number of visitors for each hour that the Park is open, during the months of September, October, November, and December :

PEDESTRIANS.

1861.	From 6 to 7 A. M.	7 to 8 A. M.	8 to 9 A. M.	9 to 10 A. M.	10 to 11 A. M.	11 to 12 A. M.	12 to 1 M.	1 to 2 P. M.	2 to 3 P. M.	3 to 4 P. M.	4 to 5 P. M.	5 to 6 P. M.	6 to 7 P. M.	7 to 8 P. M.	8 to 9 P. M.
September.....	749	1,956	3,448	5,516	7,349	6,435	6,033	7,936	21,789	41,065	40,794	19,731	6,595	3,465	1,845
October.....	1,386	2,245	3,728	5,398	7,379	6,629	6,336	8,091	25,002	25,314	20,765	8,107	2,676	1,246	684
November.....	1,033	1,691	2,761	3,785	5,212	4,001	4,314	4,695	10,081	26,309	11,068	3,665	1,516	518	238
December.....	23	1,226	2,876	4,605	7,142	6,403	5,851	7,567	14,439	18,582	11,012	2,874	1,252	744	15
Total.....	3,191	7,118	12,813	19,204	27,082	23,468	22,534	28,289	71,311	111,270	83,639	34,377	12,039	5,973	2,782

EQUESTRIANS.

September.....	625	899	550	442	372	312	204	209	341	527	918	1,006	421	104	22
October.....	993	1,377	1,113	843	642	408	519	394	621	1,209	1,629	1,097	224	35	14
November.....	916	1,186	868	674	522	4,781	339	432	653	954	1,076	425	151	28	20
December.....	3	880	662	574	717	343	307	343	791	1,081	831	152	53	35	0
Total.....	2,537	4,342	3,193	2,533	2,253	5,844	1,369	1,878	2,406	3,771	4,454	2,680	849	202	56

VEHICLES.

September.....	669	1,110	1,795	2,680	2,932	1,986	1,594	2,022	3,697	6,743	9,784	8,135	4,039	1,488	616
October.....	908	1,652	2,351	3,043	3,357	2,878	3,028	3,491	5,663	10,115	11,778	8,067	2,230	617	192
November.....	1,086	1,548	1,992	2,521	2,878	2,019	2,142	2,933	5,528	8,782	7,383	3,164	821	321	106
December.....	21	698	1,180	1,748	2,658	2,091	2,211	3,163	7,692	11,950	11,374	2,322	719	274	1
Total.....	2,679	5,008	7,318	9,992	11,825	8,974	8,975	11,609	22,570	37,590	40,319	21,688	7,809	2,700	915

Generally speaking, it appears that in the earlier part of the day, equestrians, and but few pedestrians, and those mainly walking for exercise, are at the Park. These are immediately followed, after an early breakfast, by visitors from all parts of the country, on foot, or in carriages, citizens not much engaged in business, and ladies, with their children, often bringing with them baskets of refreshments to be partaken of at some quiet place about the grounds; groups of children with their guardians appear about the same time.

In the afternoon numbers increase, and at one hour or another, according to the season, the Park is gay with a throng of citizens with their equipages, only equaled in the largest foreign capitals.

At the special entertainments at the Park, such as music and skating, the number of visitors is very largely augmented, and shows that both in winter and summer these occasions are appreciated by the public.

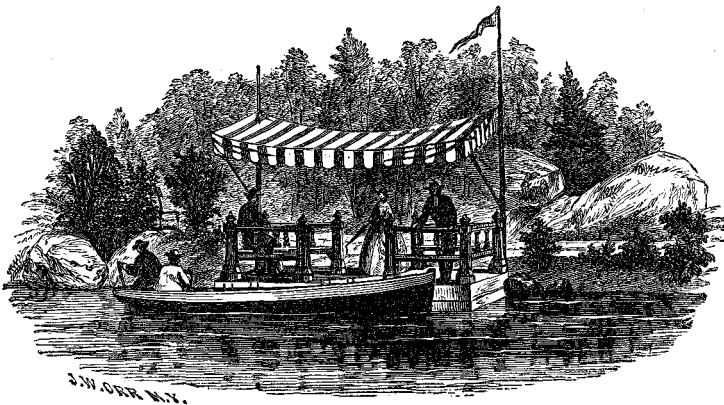
The attractions of the Park appear to have increased very much, among all classes, the disposition for out-of-door exercise.

Under license of the Board, boats have been placed upon the lake by Mr. Thomas S. Dick. Regulations for this service, prescribed by the Board, require two classes of boats, the passage or omnibus boat, and the call or private boat. From May to November, a passage-boat leaves the Terrace stairs to go around the lake, stopping at prescribed landings, to receive or land passengers at intervals of not exceeding thirty minutes, and of not more than fifteen minutes, if required by the public.

The rate of fare for a passage around the lake is ten cents. A passage boat is not allowed to carry more than twelve persons at once, and, when full, the landings may be passed, unless some one desires to land.

The call boats may be secured, by persons desiring to use them, in the order of application, for a private party at fixed rates, not more than six persons being allowed in one of these boats at a time. Neither class of boats is allowed to approach within ten feet of the shore, except when landing.

The boats and their appurtenances and the fixtures at the landings, are kept in order by the contractor. The license fee of each boat for the season is one hundred dollars. The boatmen are required to be neat in appearance, civil, and attentive, and to conform to the rules of the Park.



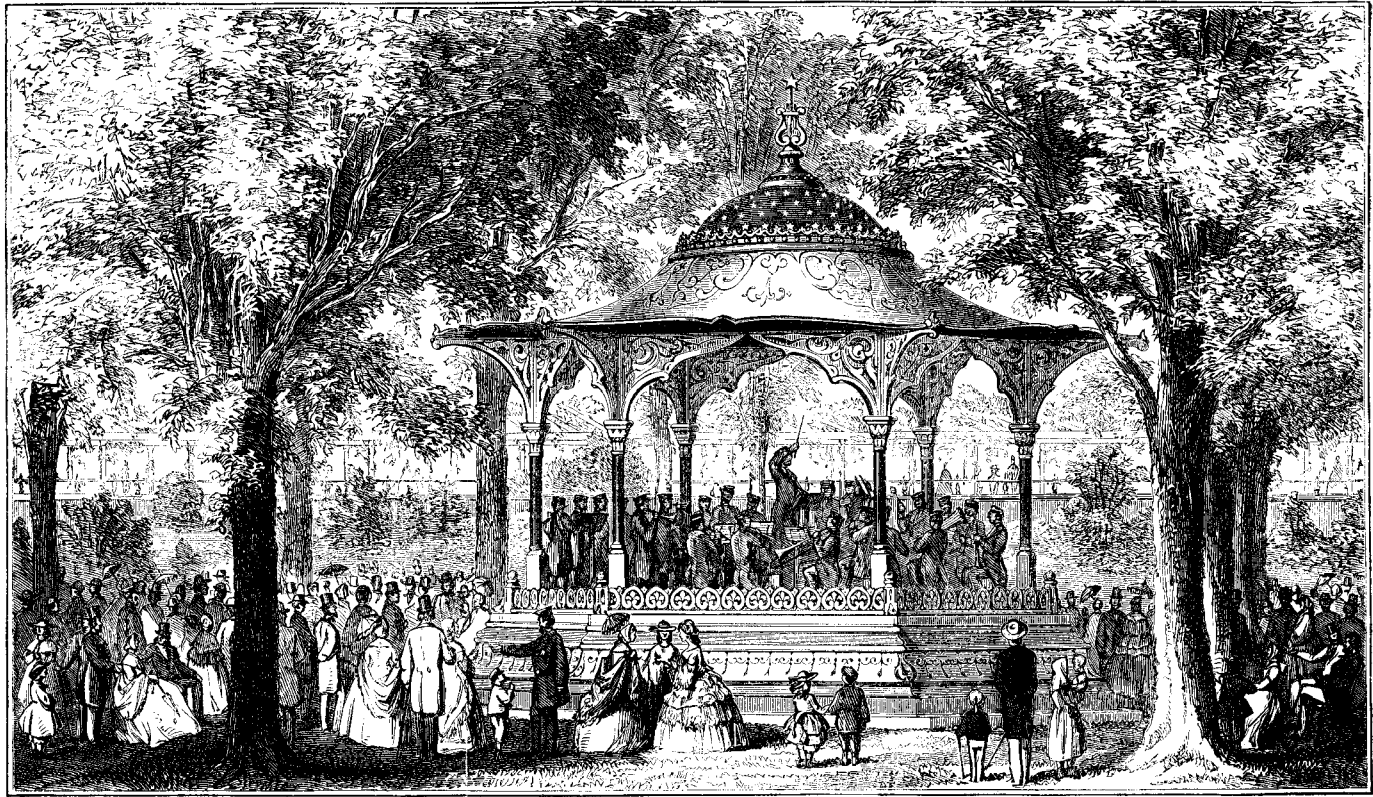
BOAT LANDING SOUTH OF RAMBLE.

The NUMBER OF PASSENGERS CARRIED in each class of the boats for the season, from April 24th to November 28th, 1861, is as follows :

	CALL BOATS.	PASSAGE BOATS.
For the week ending April 27th,	37	146
" " May 4th,	7	61½
" " " 11th,	63	244½
" " " 18th,	91	269½
" " " 25th,	105½	308½
" " June 1st,	109½	435½
" " " 8th,	76	285½
" " " 15th,	121	600½
" " " 22d,	187	739½
" " " 29th,	228½	824½
" " July 6th,	283½	723½
" " " 13th,	175½	417½
" " " 20th,	359	770
" " " 27th,	243	676½
" " Aug. 3d,	164½	469½
" " " 10th,	170	533
" " " 17th,	219	622½
" " " 24th,	400	1,101½
" " " 31st,	234½	837
" " Sept. 7th,	224½	815½
" " " 14th,	263½	777
" " " 21st,	367½	701½
" " " 28th,	259½	907
" " Oct. 5th,	201	656½
" " " 12th,	119	316½
" " " 19th,	71	230½
" " " 26th,	45	84
" " Nov. 2d,	54	171
" " " 9th,	25	47½
" " " 16th,	14	24½
" " " 23d,		53½
" " " 28th,	20½	35
Total,	4,999	14,886½

The total revenue derived from these passengers, by Mr. Dick, was \$2,243 16

The total expenses of conducting the boats, not including the time of Mr. Dick, or any interest on the outlay for boats, . . . 1,584 50



MUSIC PAVILION TO BE ERECTED ON THE MALL.

It would thus appear, that a trip on the Lake is quite popular, as one of the minor attractions of the Park.

Musical entertainments have been given on the Park, when the weather admitted, in the months of August, September, and October. In the selection of music for performance, the aim has been to effect a combination of popular music with that of a more artistic character. These entertainments have been much frequented. The music is not provided at public expense.

The following are the days on which MUSIC has been given :

1859.		1860.		1861.	
Saturday, July	9	Saturday, August	25	Saturday, August	10
Saturday, July	23	Saturday, Sept.	1	Saturday, August	17
Saturday, July	30	Saturday, Sept.	8	Saturday, August	24
Saturday, August	6	Saturday, Sept.	15	Saturday, August	31
Saturday, August	20	Saturday, Sept.	22	Saturday, Sept.	7
Saturday, August	27	Saturday, Sept.	29	Saturday, Sept.	14
Saturday, Sept.	3	Saturday, Oct.	13	Saturday, Sept.	21
Saturday, Sept.	10	Saturday, Oct.	27	Saturday, Sept.	28
Saturday, Oct.	1	Saturday, Nov.	18	Saturday, Oct.	5
Saturday, Oct.	15			Saturday, Oct.	12

TOTAL NUMBER OF MUSIC DAYS.

1859,	10
1860,	9
1861,	10

During the skating season and until more permanent arrangements are made, a sufficient number of persons have been licensed to erect small houses for the sale of refreshments in the immediate vicinity of the lake, on paying a license of \$150 each for the season.

Persons so licensed are required to keep orderly establishments, to conform to the rates they are allowed to

charge for each specified article, and not to sell intoxicating liquors.

Other persons are licensed to sell and hire skates and chairs, at prices prescribed by authority of the Board.

Any demand of rates higher than those authorized, or any neglect to make proper provision for the public, will meet immediate rectification on being reported by the aggrieved party to any Park-keeper on the ground.

The GENERAL SKATING REGULATIONS are as follows :

“ Do not go on the ice, except by the paths provided for the purpose.

“ Use the foot-scrapers, on the gang-plank, before stepping on the ice.

“ Do not drop any tobacco, segar-stumps, paper, nutshells, or other articles on the ice.

“ Avoid crowds. Even thick ice is liable to be cracked, and if a number of persons crowd on one side of a crack in the ice, it suddenly tips, and endangers the lives of all upon it.

“ Do not go in the vicinity of laborers engaged in cleaning the ice.

“ The Park-keepers are provided with abundant means of rescue, in case of accidents.

“ Cautions or directions from a Park-keeper should be immediately complied with.

“ Any want of civil attention, or any charging over the allowed rates, on the part of the licensed keepers of any of the tents or refreshment houses, should be reported to the Park-keepers.

“ A ball will be hoisted to the top of the pole, near the bell-tower, whenever the ice is in full condition for skating.

“ The national flag will be kept hoisted over the Round-House, in the middle of the main pond, whenever the ice may be walked upon with safety, and when persons can skate without seriously injuring the ice.

“ No one can remain upon the ice with safety, or with proper regard to the general interest in maintaining the ice in good order for skating, when the national flag is not flying.

“ A red flag over the Round-House indicates either that the ice is very dangerous, or that it is being flooded for the purpose of forming a new surface.

“ In the latter case, it will be kept flying until new ice is formed.

“ The red flag will not be displayed unless there is an absolute necessity that the pond should be cleared.

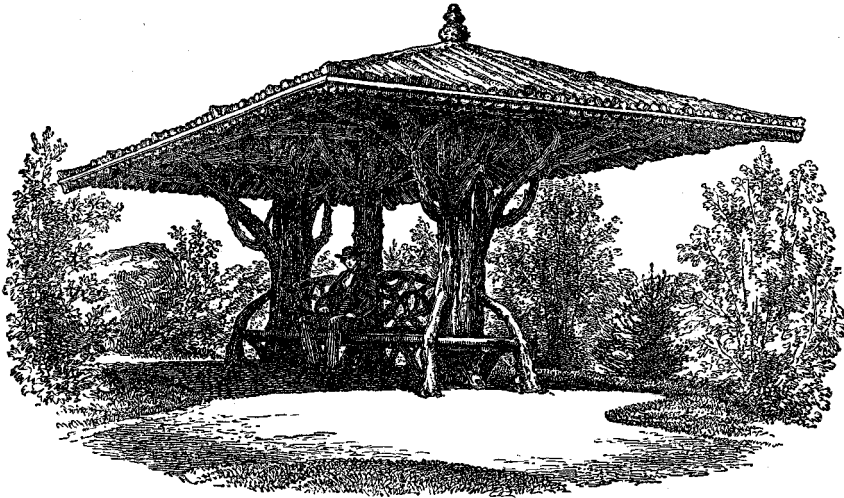
“ The above instructions are formed with a design to place no restrictions, except such as are necessary for the preservation of the ice in the best condi-

tion for the general enjoyment, and it is hoped that they may be so willingly observed by all, that the occasion to resort to other measures, to secure their observance, will never be required."

No amusement has a wider popularity than that of skating, and the facilities for its enjoyment at the Park have been instrumental in its general recognition over the whole country, as a healthful and graceful accomplishment for both sexes. "The Pond" at Fifty-ninth street, so called to distinguish it from "the Lake," has been opened for skating, and the numbers that visit both sheets of ice show that the combined space is demanded by the skating public.

Arrangements have been made to accommodate those wishing to enjoy the sport of coasting, or sliding down hill.

These amusements attract large numbers to the Park, and completely relieve the apprehensions of those who feared its desertion during the severer seasons.



SHADED SEAT SOUTHEAST OF THE RAMBLE.

*The subjoined table shows the days on which there was
SKATING on the Lake during the past three seasons :*

1858-59.	1859-60.	1860-61.
December 29.	December 24.	December 14.
January 3.	December 25.	December 15.
January 22.	December 26.	December 16.
January 23.	December 27.	December 18.
January 24.	December 28.	January 11.
January 25.	December 29.	January 12.
January 26.	December 30.	January 13.
January 27.	December 31.	January 14.
January 28.	January 1.	January 18.
January 29.	January 2.	January 19.
January 30.	January 3.	January 20.
February 10.	January 4.	January 21.
February 11.	January 5.	January 22.
February 12.	January 6.	January 23.
February 21.	January 7.	January 26.
February 22.	January 26.	January 28.
February 23.	January 27.	January 29.
March 5.	January 28.	January 30.
March 6.	January 29.	January 31.
	January 30.	February 1.
	January 31.	February 4.
	February 1.	February 5.
	February 2.	February 6.
	February 3.	February 7.
	February 4.	February 8.
	February 5.	February 9.
	February 8.	February 10.
	February 9.	
	February 10.	
	February 11.	
	February 12.	
	February 13.	
	February 14.	
	February 15.	
	February 16.	
	February 17.	
	February 20.	
	February 21.	
Number of days, . . 19	Number of days, . . 38	Number of days, . . 27

The force of Park-keepers is required to see that order is maintained, and that the ordinances of the Park are respected; they are trained and thoroughly drilled and instructed for their peculiar duties.

The work of construction goes on concurrently with the use of completed portions of the Park, and although it may be sometimes difficult for visitors to perceive why the rules are enforced on ground not entirely finished, yet the necessity exists.

The keepers are instructed to be courteous and respectful in the discharge of their duty, and to afford promptly to visitors all proper aid and information.

When it is considered that the establishment and successful conduct of a park of great extent has not yet been accomplished under any except those forms of government where absolute and peremptory authority is maintained, it becomes an interesting problem whether the rules requisite for the maintenance of the Park in a condition such as will gratify a cultivated taste, and operate as an educator of the people, will meet with cheerful acquiescence.

The Drive of the Park, bearing a strong contrast to the drives to which the people of this city have been accustomed, naturally attracts travel to the Park roads, and nothing but a rigid enforcement of the ordinances of the Board, with respect to the rate of speed for driving, will maintain the Park as a safe resort for persons of both sexes who now frequent it. It has been found necessary to adopt regulations, which are somewhat novel, and to which the people are not yet quite accustomed. It is

gratifying to observe the very general disposition exhibited to observe the rules, and to maintain the Park in the condition of a highly finished pleasure ground.

The offences committed are much more frequently the result of thoughtlessness than of wilful design to do injury. Every pains is taken, by warnings posted about the grounds, to direct the attention to the rules—a work not always most effectually accomplished by their frequent repetition; the very frequency of their occurrence renders them the less effectual in fixing the attention.

Of the 2,404,659 persons who have visited the Park this year, but ninety-three arrests have been made, as follows :

In January,	5
February,	6
March,	7
April	6
May,	6
June,	24
July,	9
August,	7
September,	16
October,	3
November,	2
December,	2
<hr/>	
Total,	93

And for the following delinquencies :

Assault and battery,	3
Drunk and disorderly,	35
Firing a pistol,	1
Petty larceny,	11
Violation of Central Park Ordinances, .	15
Vagrancy,	1
Fast driving,	23
Other offences,	4
	<hr/>
	93

The keepers have duties to perform other than that of making arrests. They are placed at the Park to warn persons against violating the rules, to check slight offenses, to give information, to guide strangers, and to report upon any wrong-doing that is committed in any part of the Park, at any hour of the night or day. In the exercise of their functions, they are called on to be vigilant, discreet, attentive, and courteous, and no excuse is admissible for the omission, on their part, of any of these requirements.

The expenses of maintenance of the Park are classified under the following heads. The amount of each class for the year is stated in the Treasurer's account.

I. *Roads* includes—

Repairs of road-bed, surfacing, rolling, &c.; repairs of curb and gutter; repairs of road drainage; cleaning roads and silt basins; breaking stones, &c.

- II. *Walks* includes—
Surfacing, rolling, and cleaning silt
basins.
- III. *Plantations* includes—
Dressing and manuring, mulching
and protecting tender plants.
- IV. *Turf* includes—
Rolling, cutting and removing grass.
- V. *Water* includes—
Removing rubbish from lakes.
- VI. *Ice* includes—
Cleaning and scraping ice, building
huts, and illuminating pond.
- VII. *Surface Drainage* includes—
Repairs of sewers and basins.
- VIII. *Irrigation* includes—
Sprinkling roads, watering turf and
plants, and repairing hydrants.
- IX. *Thorough Drainage* includes—
Repairs of pipes and basins, and
cleaning basins.
- X. *Traffic Roads* includes—
Cleaning and repairing silt basins.
- XI. *Masonry* includes—
Repairing bridges, &c.
- XII. *Tools* includes—
Repairing and making tools.
- XIII. *Buildings* includes—
Taking care and repairs.

XIV. *Miscellaneous* includes—

Making and repairing temporary
roads and bridges, furniture,
walls, wire fences, &c.

XV. *Gate-keepers* includes—

Wages paid gate-keepers and ex-
penses of uniforms.

XVI. *Park-keepers* includes—

Wages and uniforms.

XVII. *Crawford Collection of Casts* includes—

Packing, freight, storage, and cart-
age of the same.

*There has been received, for the year 1861, the following
sums of money:*

From refreshment licenses,	\$900 00
From skate licenses,	450 00
From ice chair licenses,	150 00
From pound fines, for stray animals, &c., less the expense of their keeping,	112 89
From sale of grass,	280 00
From sale of buildings,	437 00
Total,	<hr/> \$2,329 89

By request of the Governor of the State, the old Arsenal building was occupied by a regiment of the Scott Life Guard, during its organization; the expense to the Board, by reason of this occupation, was nearly the sum of \$1,000, which amount the Board trusts will be refunded by the State.

The aspect of business affairs during the year has been such as to render inexpedient the accomplishment of certain proposed arrangements for the general public convenience, as the amount of annual revenue to be derived from them could not be fixed at as high a rate as in more favorable times. A rent or license fee must be fixed with some reference to the income to be derived by the person licensed, and it has not been thought wise to fix this rent or fee during a state of general business depression.

Without at all interfering with the free enjoyment of the advantages of the Park, the Board still entertain the hope of deriving from it a considerable revenue, to be applied to diminish the expense of its maintenance, and of making it in part, at least, self-sustaining.

It is hoped that proper carriages, to run about the Park, at cheap rates, a refectory, and other facilities, may be established in the coming year, from which a revenue may be derived.

A main object of the Park was, by affording the opportunity, to encourage out-of-door physical exercise. To the general neglect of those athletic sports, games, and exercises, that do so much to develop the frame and invigorate the system, may be traced that delicate appearance of our population, which has been the subject of common remark.

The Board hopes to effect some arrangement by which youth of both sexes may be encouraged to engage in exercises of this character ; and believe that if a portion of the time, now devoted in public schools to study, were

given to these exercises, much suffering would be avoided, and our youth improved in vigor and in capacity of endurance.

No one, familiar with the number of hours during which children are engaged in study in the public schools, can fail to perceive the necessity for the earliest possible abatement of the evils attending upon their confinement together for study, in badly ventilated school buildings. This subject has been for successive years brought to the notice of the Board of Education, in various ways.

On the first day of October, 1860, there were in the public and corporate schools of this city 165,226 pupils; of these, 25,532 were boys, in the grammar schools, 20,670 girls in the grammar schools, and 93,346 boys and girls in the primary departments. Though the school age is from 4 to 21, probably not ten per cent. of these children are over 14 years of age. The physical restraint necessarily placed upon young children for so long a period, added to their mental exertions, even in a pure atmosphere, will produce the most deleterious effects; what then must be the results of their confinement, for the period now required by the rules of the schools, in such an atmosphere as appears, by the documents of the Board of Education, to pervade many of the school-rooms under its charge?

S. S. Randall, Esq., the Superintendent of Public Schools in this city, in his report to the Board of Education in 1855, suggests

"The expediency and propriety of reducing the number of hours during which attendance on the public schools is required, from six to five." "Two

hours of this instruction in the morning, and two in the afternoon, with an interval of one hour of necessary relaxation and exercise, is the utmost extent to which attendance upon the school should be required."

In his report for 1856, he says :

"Children of a tender age ought not, as is now too generally the case, in these departments, to be crowded together in small and ill-ventilated apartments, with uncomfortable seats, and scarcely any facilities for changing their position, or exercising their muscles, for hours together."

"Our present school system, in its present shape, demands the confinement of the child, within the inclosure of the walls of the school building, for nearly six hours of each school-day, the assiduous exercise of his mental faculties, with scarcely an interval of relaxation during that period, and then dismisses it home with the strict injunction to prepare, for the ensuing day, tasks and lessons requiring three or four additional hours of severe study to accomplish."

"The time which should be devoted to rest, to relaxation, to sleep, is thus seriously and systematically invaded, the mental energies overtasked, and the very springs of life imperceptibly but steadily and surely undermined. To whatever extent this pernicious system prevails in our elementary and higher institutions of learning, it should be promptly discountenanced and authoritatively discontinued."

Again, in his report of 1858, Mr. Randall says :

"In many of the Primary Departments, on the other hand, from 800 to 1,000 children are daily congregated, and exposed to all the frightful and nearly unavoidable consequences of a sudden alarm of fire, or other dangerous casualty, to say nothing of the imperfect ventilation, the exposure to contagious diseases, and the want of adequate means of physical exercise and relaxation."

In his report of 1856, Mr. Seton, the venerable Assistant Superintendent of Schools, says :

"Physical training is next in importance. A larger portion of time given to exercise in the play-ground, and occasionally within the school-room, would be advantageous to the better exercise of the mental powers." * * * * * "A patient trial would prove that with the young, especially in primary schools, time given to physical exercise will always be a gain of the mental powers."

William Jones, Esq., Assistant Superintendent of Schools, in his report to the Board for 1859, says :

"The necessity of some system of physical exercise has long been urged upon the local Boards, as essential to the health as well as to the comfort

of the pupils of the several departments, and particularly to those of the Primary Departments; owing to the crowded state of their class-rooms, frequent changes and recesses are required."

"Nothing is better for youth than extensive play-grounds around a school-house; the enormously large price of property forbids them the enjoyment they afford."

A report of the Committee of the Board of Education during the last year contains these extraordinary statements, well calculated to impress every thoughtful man.

"Of these ninety-two school-buildings, there are not ten which are thoroughly heated; in several, during the past winter, the cold has been so intense, at times, as to render the dismissal of the schools a matter of necessity, and it is no extraordinary sight to see teachers, in the performance of their duties, in school hours dressed in furs."

"The results of this general lack of ventilation are seen in the listlessness on the part of both teachers and scholars, and the dull following of routine, which are standing subjects of complaint for all our best teachers, but which are only the inevitable consequences of breathing an atmosphere saturated with the noxious vapors exhaled from the lungs and bodies, and oftentimes from the dress also, of the masses of children, which the system of the Department congregates in a single building." * * * * "The enormous mortality from diseases of the lungs in this city, averaging 190 deaths per week, is in great part attributable to the foul air breathed every day by 60,000 children in the schools."

In the Free Academy, there were on the 1st day of October, 1860, 820 students, from 13 years of age upwards.

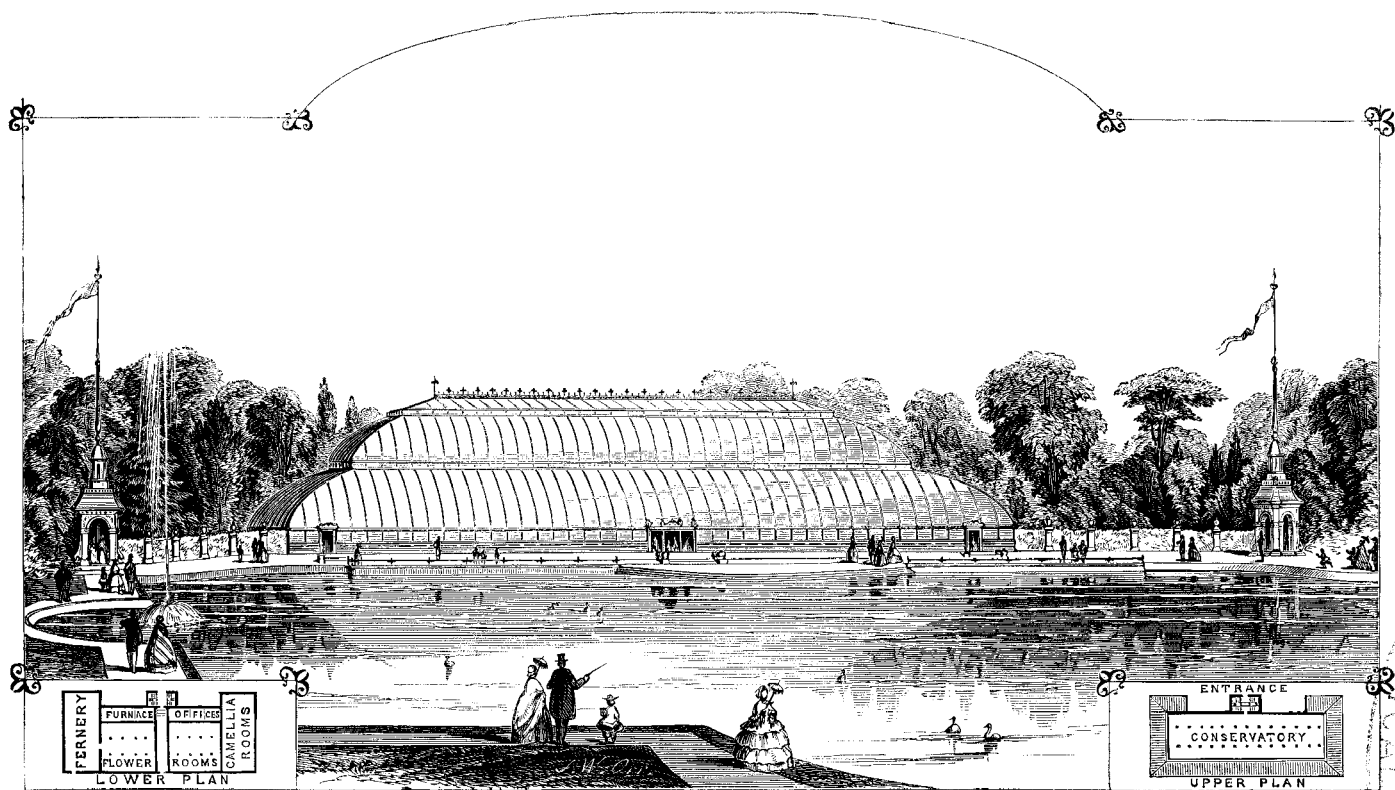
In other colleges and schools, not immediately deriving aid from the public funds, are many thousands of young men and women. The Board of Education has probably availed itself of the best known means of heating and ventilating class-rooms, and they are yet quite insufficient and inadequate.

To arrange a feasible plan by which the children of the public schools of both sexes shall be instructed and practiced in harmless athletic, out-of-door sports, under judi-

cious supervision, would be to render a valuable public service.

Objections will be suggested, and obstacles arise in the way of such an arrangement, but it is believed to be both practicable and desirable. That those having charge of the schools would promptly and gladly co-operate in any judicious measure to obviate the evils with which they have so long contended, there is no room for doubt. The extracts from educational documents before given, and which could be much extended, show how keenly the necessity of providing the means of exercise is felt, but the means of doing it have not heretofore been accessible.

The fifty-one Grammar schools for boys, the fifty Grammar schools for girls, the ninety Primary schools, and the Free Academy, would each furnish in turn one or two classes each day, for exercise in walking about the grounds, in running, ball, or cricket, in skating, or sliding, or in numerous other harmless sports that could easily be contrived for them. The various Sunday-school organizations might, under their superintendents and teachers, afford valuable aid in carrying into effect some general plan for the recreation and exercise of children. Suppose that so large a proportion as nine-tenths of the pupils of the public schools could not be disposed to take advantage of any opportunity that might be offered them at the Park; still there would be in the other tenth a number sufficient to test the practicability of a general scheme of physical exercise on the grounds allotted for the purpose.



GENERAL VIEW OF PROPOSED CONSERVATORY.

LIBRARY OF THE
 GEOGRAPHICAL SOCIETY
 1850

In these exercises, both boys and girls should be under the supervision of instructors of high character, practiced and competent to keep them within the bounds of order and decorum, and under arrangements that should be such that parents generally would feel quite safe in sending their children to join in them.

It may be said that children would not resort frequently to the Park, by reason of the distance. Within from fifteen to thirty minutes' walk of some part of the Park are public schools, having an attendance of over 10,000 scholars. With the co-operation of the educational authorities, the experiment might be tried by those in the vicinity, and, if successful, systematic arrangements, by which physical exercise should become a regular part of the course of instruction, might be made for an equal accommodation of all.

Conveniences for simple and safe exercise and amusement can readily be arranged for children of tender years, at spaces especially set apart for the purpose, so that the grounds may not be trampled or injured in appearance.

The city railroad companies might, by a small reduction of their regular fares to children going from the public schools, very much aid in making the use of the Park very general with youth in all parts of the city. The details of an arrangement with these companies could be readily suggested.

Against this it would be urged, that adult players, and the numerous ball and cricket clubs, would be excluded

by reason of the occupation of the ground by the juvenile players; this objection should be considered.

There are three regularly organized cricket clubs, belonging to the city, and more than fifty ball clubs, averaging about fifty members each. Many of these clubs now have their grounds, which are kept in order at their own expense, and to which they resort for play.

It is obviously impossible that the ordinary play of these clubs should be allowed on the Park; the space is not sufficient. The Park has attractions to those that visit it, merely as a picture; people walk, and drive, and ride there, not only because the walks, and ride, and drive are superior, but because the eye is gratified at the picture, that constantly changes with the movement of the observer. Whatever defaces or injures this picture makes it less attractive to the great mass of visitors, and should, for the general good, be excluded.

The lawn, the flowers, the trees, the water, all combine to form this picture, and each adds to its attractiveness.

If the trees are cut and broken, if the waters are stagnant, if the flowers are trampled, or if the grass is beaten down and tracked, the picture is in so much rendered unattractive, and the enjoyment of the great mass is thereby diminished.

The constant play of a great number of cricket and ball clubs would be inconsistent with any other use of the ground, it would be impossible to keep it in order. The lawns would be rendered unsightly before one season passed.

There seems, moreover, no propriety in making an appropriation of a portion of the Park to one class of adult visitors, to the exclusion of others.

Perhaps the best arrangement, at present practicable, would be, to admit occasional match games upon the grounds; while the ground is mainly used as a place of exercise for boys and girls.

The Commissioners of the Park still adhere to their purpose of completing the Park with the means placed at their disposal, of excluding the exercise of any political influences over persons in their employ, of maintaining system, order, and economy in every department, and of preserving the domain of the Park free from any influences to which exception could justly be taken by those who value purity in morals and manners, and who appreciate the beautiful in art and nature.

The following is a statement of DONATIONS made to the Board for the use of the Park, with the names of the Donors.

The statue of Flora, in marble, by CRAWFORD, presented by R. K. HAIGHT, Esq.

Eighty-seven Casts, in plaster, of the works of the late THOMAS CRAWFORD, presented by MRS. LOUISA W. CRAWFORD, consisting of the following statues, bas-reliefs, and sketches:

STATUES.

- | | |
|---------------------------------------|---|
| 1. Orpheus, life size. | 7. Flora, life size. |
| 2. Apollo and Diana, third life size. | 8. Beethoven, heroic. |
| 3. Cupid, life size. | 9. The Mechanic, a little larger than life size. |
| 4. Genius of Mirth, life size. | 10. The Schoolmaster, a little larger than life size. |
| 5. Pilgrim Princess, third life size. | |
| 6. Boy playing marbles, life size. | |

- | | |
|--|--|
| 11. Schoolboy, a little larger than life size. | 21. Hebe and Ganymede, life size. |
| 12. The Merchant, a little larger than life size. | 22. Mercury and Psyche, one third life size. |
| 13. The Soldier, a little larger than life size. | 23. Daughter of Herodias, life size. |
| 14. The Woodsman, a little larger than life size. | 24. Dancing Jenny, life size. |
| 15. Indian Hunter, a little larger than life size. | 25. Boy with a broken tambourine, life size. |
| 16. Indian Chief, a little larger than life size. | 26. Aurora, two thirds life size, |
| 17. Indian Woman, a little larger than life size. | 27. Tenants, life size. |
| 18. America, a little larger than life size. | 28. The Peri, life size. |
| 19. Indian Grave. | 29. Hunting-boy with hound, life size. |
| 20. Hebe, life size. | 30. Raphael, one third life size. |
| | 31. James Otis, heroic. |
| | 32. Patrick Henry, colossal. |
| | 33. Thomas Jefferson, colossal. |
| | 34. Children in the Wood, life size. |
| | 35. Dying Indian Girl, two thirds life size. |

BAS-RELIEFS.

- | | |
|--|--|
| 1. Woman of Samaria. | 12, 13, 14. Three bas-reliefs of a Nymph and Satyr. |
| 2, 3. Two monumental groups. | 15. Huntress. |
| 4. Origin of Drawing. | 16. Repose in Egypt. |
| 5. Hercules and Diana. | 17. Justice. |
| 6. Cupid stringing his bow with flowers. | 18, 19. Two niches for the monument of Mr. Binny. |
| 7. Apollo and Pegasus. | 20, 21. Two bas-reliefs for the Washington Monument, Va. |
| 8. Muse with the lyre. | 22. Christ blessing little children. |
| 9. Anacreon and Nymph. | |
| 10. Fawn and goat. | |
| 11. Muse and Cupid. | |

SKETCHES.

- | | |
|--|-------------------------|
| Eve with Cain and Abel. | Beethoven. |
| Eve listening to the Tempter. | James Otis. |
| Two sketches of the Flora. | Patrick Henry. |
| Thomas Jefferson. | Mason. |
| Washington Monument, Va. | Two sketches of Sappho. |
| Equestrian of Washington. | Rebecca. |
| Equestrian of Washington with Liberty. | Daughter of Herodias. |
| Freedom, for the U. S. A. Capitol. | Dying Indian Woman. |
| | The Tenants. |

Dancing Jenny.	Boy with broken tambourine.
Aurora.	Indian Chief.
Justice and History, for the U. S. A.	Raphael.
Capitol.	Spring—Autumn.
Jacob wrestling with the Angel.	Burd Monument.
Children in the Wood.	Jupiter and Psyche.
Washington.	The Pediment for the U. S. A. Capitol.
Plan and Model for laying out the Park, presented by Mrs. SUSAN M. PARTSH.	

This statue of Flora, generously donated by Mr. HAIGHT, has long been recognized as a *chef d'œuvre* of its distinguished author, and the casts of all the works of the same artist form a collection of peculiar interest. No merely mercantile estimate can express their true value.

The following ANIMALS have also been presented :

1860.

May 24. Twelve White Swans, presented by the Senate of the city of Hamburg.

Oct. 18. Twenty-four White Swans, presented by the Worshipful Company of Vintners, London.

Twenty-six White Swans, presented by the Worshipful Company of Dyers, London.

Nov. 1. Ten White Swans, presented by the Senate of the city of Hamburg.

(Of these sixty-two swans, twenty-one are dead.)

Two Trumpet Cranes, presented by G. Granville White, Esq.

(One of the above is dead.)

One Peacock, presented by G. Granville White, Esq.

One American Eagle, presented by Albert S. Joslyn.

One Deer, presented by Joseph Conrad.

One Deer.

Gold Fish, presented by William D. Murphy, Esq.

Two Canadian Geese, presented by Charles M. Graham, Esq.

The above animals are in good condition, except otherwise noted, and are valuable subjects of constant interest to visitors.

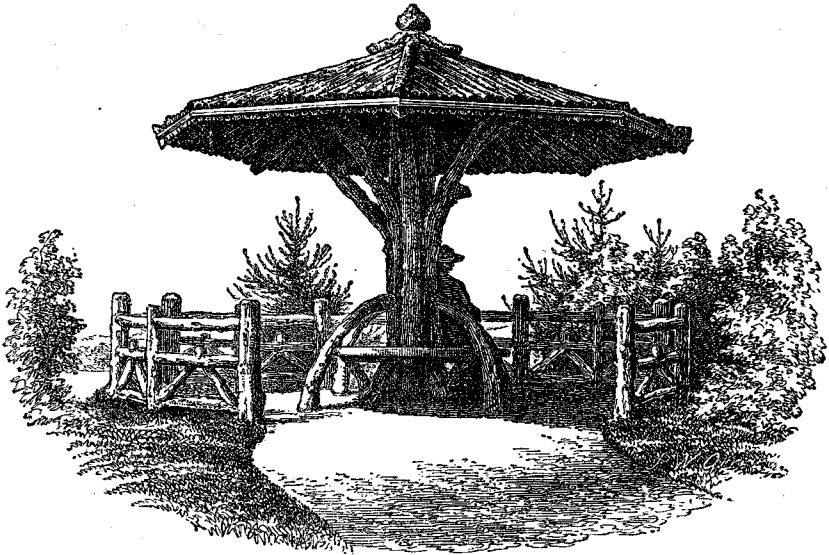
A statement in detail of the expenses of the past year is herewith presented, and also a condensed statement of the Treasurer's accounts.

Dated New York, December 31st, 1861.

Respectfully submitted,

ANDW. H. GREEN, R. M. BLATCHFORD,
Comptroller of the Park. *President of the Board of*
Commissioners of the Central Park.

C. H. RUSSELL, HENRY G. STEBBINS,
Chairman Finance Committee. *Vice-President.*



SHADED SEAT SOUTHWEST OF THE RAMBLE.

SUMMARY OF THE TREASURER'S ACCOUNT.

Construction Account.

Balance on hand, December 31st, 1860, \$51,161 72

The total receipts of the year ending December

31st, 1861, are as follows:

From issue of stock by the city of New

York,	\$459,900 00
Sale of grass,	280 00
Sale of buildings on the Park,	437 00
Sale of ducks,	10 50
Pound receipts,	83 99
Sale of stone,	96 94
Licences,	1,500 00
Premium on exchange, gold for silver,	22 50

462,330 93

\$513,492 65

The total expenditures for the year ending December 31st, 1861, are as follows:

Salaries and compensation of officers, clerks &c.	\$9,805 71
Surveys, engineers, architects and draughtsmen,	26,167 08
Incidental expenses, &c.,	8,872 50
Materials of construction and tools,	110,606 31
Stationery, printing, advertising, engineers' drawing materials, and books of account,	1,244 13
Trees and plants, manure and cartage of the same,	7,766 82
Labor account, amount paid laborers, mechanics, cartmen, &c.,	234,600 35
Earth filling,	80,100 76

479,163 66

Balance, \$34,328 99

The total receipts of the Board from the commencement of its organization, May 1st, 1857, are as follows:

From issues of stock by the city of New York,	\$3,143,100 00
Sale of buildings on the Park,	5,990 37
Lost tools,	407 23
Rent,	50 00
Exhibition of plans,	294 85
Sale of grass,	675 00
This amount over in making change,	02
Sale of barrels,	49 20
Bank of Commerce, interest on deposits,	2,909 97
Pound receipts,	524 41
Sale of horse,	40 00
Licenses for sale of skates and refreshments,	2,200 00
Labor and materials furnished on the Park,	92 35
Premium on exchange, gold for silver,	22 50
Sale of stone,	96 94
Sale of ducks,	10 50
	<hr/> \$3,156,463 34

The expenditures from May 1st, 1857, the date of the organization of the Board, to January 1st, 1858, were,	\$77,881 41
Expenditures from January 1st, 1858, to January 1st, 1859,	507,487 86
Expenditures from January 1st, 1859, to January 1st, 1860,	1,179,246 47
Expenditures from January 1st, 1860, to January 1st, 1861,	878,354 95
Expenditures from January 1st, 1861, to January 1st, 1862,	479,163 66
	<hr/> 3,122,134 35
Balance,	<hr/> \$34,328 99

Maintenance Account.

Balance on hand, December 31st, 1860,	\$19,804 63
Expenditures on account of maintenance from March 19th, 1860, to January 1st, 1861,	5,698 28
	<hr/>
Balance carried to the credit of Maintenance, 1861,	\$14,106 35
Carried forward,	<hr/> \$14,106 35

Brought forward,	\$14,106 35
Received from Comptroller for maintenance of Park for the year 1861,	114,000 00
	<u>\$128,106 35</u>

The expenditures on account of Maintenance, 1861, are thus far as follows:

	LABOR.	TOOLS AND MATERIALS.	TOTAL.
Ice,	\$2,847 95	\$888 57	\$3,736 52
Tools,	1,548 29	445 44	1,993 73
Roads,	12,006 36	3,039 46	15,045 82
Irrigation,	3,984 65	324 44	4,309 09
Masonry,	6 21		6 21
Plantations,	4,209 68		4,209 68
Transverse roads,	148 14		148 14
Turf,	8,536 47	1,125 09	9,661 56
Miscellaneous,	4,023 24	1,977 42	6,000 66
Water,	122 63		122 63
Walks,	2,746 59	508 28	3,254 87
Surface drainage,	316 13		316 13
Thorough drainage,	465 68		465 68
Crawford collection of casts,			3,065 24
Buildings,	3,390 99	168 98	3,559 97
Park-keepers' and gate- keepers' uniforms,			1,506 85
Park-keepers' wages,			29,433 32
Gate-keepers' wages,			9,701 86
Proportion of salaries,			9,730 00
			<u>\$106,267 96</u>
Balance,			<u>\$21,838 39</u>
The balance on hand December 31st, 1861, Construction ac- count,			\$34,328 99
The balance on hand December 31st, 1861, Maintenance ac- count,			21,838 39
			<u>\$56,167 38</u>
The liabilities December 31st, 1861, are about,			<u>\$220,000 00</u>

December 31st, 1861.

ANDW. H. GREEN,
Treas. Board of Commrs. of Central Park.

APPENDIX A.

COPY OF PREAMBLE AND RESOLUTION ADOPTED BY THE BOARD OF SUPERVISORS, APRIL 24th, 1861.

“ *Whereas*, In view of the present unsettled state of the country, and the increased expenses of the county, in order to sustain the United States Government to put down the armed rebellion organized in several of the States, it is proper that all unnecessary expenditures of the county funds be avoided ; therefore

“ *Resolved*, That the Commissioners of the Central Park, the Commissioners of the new Harlem Bridge, and all other Boards of Commissioners drawing money from the County Treasury, be requested to suspend the work under their control, so far as may be warranted by a proper regard for the public interest.”

COMMUNICATION OF THE COMMISSIONERS OF THE CENTRAL PARK ON THE SUBJECT OF THE ABOVE RESOLUTION.

Board of Commissioners of the Central Park.

OFFICE, BANK OF COMMERCE BUILDING, }
New York, May 21st, 1861. }

To the Hon. the Board of Supervisors of the County of New York :

“ The Commissioners of the Central Park have the honor to acknowledge the receipt of a communication of the Board of Supervisors, containing a preamble and resolution adopted by that Board, on the 24th ulto., by which the Commissioners of the Central Park are requested to ‘suspend the work under their control, so far as may be warranted by a proper regard for the public interest.’

“ This resolution, and the remarks of the Supervisors at the time of its adoption, immediately found their way into the newspapers, occasioning among those not well advised in the premises, misapprehensions with regard to operations at the Park during the present year, that the Commissioners found it advisable publicly to correct.

"The Commissioners of the Central Park respectfully suggest, that the discontinuance of work at the Park at this time, when employment is with difficulty obtained, will be peculiarly onerous, throwing out of employment more than a thousand mechanics and laboring men, upon whose earnings whole families are dependent for subsistence.

"To discontinue the work would not only be unwise and impolitic, with reference to the present condition of affairs, but it would be expensive and uneconomical. Many structures on the Park are unfinished and will sustain damage if not protected and completed, and engagements for carrying on portions of the work have been already entered into, that cannot be abandoned.

"While the Commissioners of the Central Park believe that a sound public sentiment coincides with the views as to the propriety of limiting public expenditure, by which they have been governed in the adoption of such measures for the conduct of the work at the Park as seemed adequate and proper, yet they do not deem this a time for public bodies to manifest a greater degree of timorousness and apprehension than has yet been shown by business men in their affairs, nor do they believe that they would be justified in a suspension of their work.

Early in the year the policy of the Commissioners of the Central Park, with respect to the work under their charge, looked to a call upon the Common Council of the city (the body by law required to issue stock of the city for the construction of the Park) for an amount much less than that which they are authorized by law to expend.

"They have not yet seen any sufficient reason to change this policy, nor have they any doubt that the Board of Supervisors, on being informed of the considerations that have actuated the Commissioners of the Park in its adoption, will concur with the views which the Commissioners have felt it their duty to express, to the end that constant inquiry and uncertainty on the part of mechanics, laborers, and others engaged at the Park, may be promptly answered, and put at rest."

ANDREW H. GREEN,
Comptroller of the Park.

R. M. BLATCHFORD,
*President of the Board of
Commissioners of the Central Park.*

COPY OF PREAMBLE AND RESOLUTION ADOPTED BY THE BOARD OF
SUPERVISORS ON THE 9TH OF JULY, AND TRANSMITTED TO THIS
BOARD.

" *Whereas*, A large number of workingmen of this city are now without employment, and it is important that as many of them be given work as possible, while the present stagnation of business lasts.

" *Resolved*, That the preamble and resolution adopted April 24, 1861, viz. :

" *Whereas*, In view of the present unsettled state of the country, and the increased expenses of the county, in order to sustain the United States Government to put down the armed rebellion organized in several of the States, it is proper that all unnecessary expenditures of the county funds be avoided ; therefore

" *Resolved*, That the Commissioners of the Central Park, the Commissioners of the New Harlem Bridge, and all other Boards of Commissioners drawing money from the county treasury, be requested to suspend the work under their control, so far as may be warranted by a proper regard for the public interest,

be, and the same are hereby, rescinded."

APPENDIX B.

Copy of the bill of costs, charges, and expenses, certified by the Supreme Court Commissioners, and now on file in the office of the County Clerk, in the matter of the addition to the north end of the Park.

SUPREME COURT.

In the matter of the application of the Mayor, Aldermen, and Commonalty of the city of New York, by the Board of Commissioners of the Central Park, relative to the acquisition of lands for a public park or place, between the southerly side of One Hundred and Sixth street, and One Hundred and Tenth street, and between Fifth and Eighth avenues, in the city of New York.

Costs, charges, and expenses of Commissioners incurred in above-entitled matter :

COMMISSIONERS.

Anthony J. Bleecker, <i>objected to</i>	\$1,548 00
Hawley D. Clapp, <i>objected to</i>	1,668 00
Richard Kelly, <i>objected to</i>	1,668 00

CLERKS.

Wildes P. Walker, <i>objected to</i>	1,850 00
A. L. Bleecker, <i>objected to</i>	1,840 00
Wm. H. Plummer, <i>objected to</i>	1,588 00
Warren Brady, <i>objected to</i>	350 00

SURVEYORS.

John A. Bagley, <i>objected to</i>	32,848 00
Edward Boyle	125 00

APPRAISER.

Matthias Kelly	150 00
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RENT, &C.

Wildes P. Walker, <i>objected to</i>	\$2,889 00
--	------------

STATIONERS.

Wm. H. Arthur & Co., <i>objected to</i>	493 68
Edmund Jones & Co.	588 75

LIVERY.

Charles A. Kimball.....	26 00
Edward Van Ranst.....	10 00
Henry G. Bronson.....	5,375 00

POSTING NOTICES.

G. W. Busteed.....	60 00
P. C. Lee.....	168 00

NEWSPAPER BILLS FOR ADVERTISING.

New York Herald.....	275 00
Daily Tribune	114 23
Daily Times.....	146 32
Evening Post.....	61 20
Daily News	245 40
Morning Express	116 18
Daily Transcript.....	139 50
Evening Day Book	127 95
Commercial Advertiser	144 45
New York Atlas.....	1 90
Irish News	6 00
New York Courier.....	3 45
New York Leader.....	55 55
Metropolitan Record.....	5 75

\$54,688 06

We, the Commissioners in the above-entitled matter, having audited and examined the bills rendered, do hereby approve the same at the amounts above named.

New York, December 22, 1860.

ANTHONY J. BLEECKER,	} Commissioners.
HAWLEY D. CLAPP,	
RICHARD KELLY.	

New York City and County, ss.:

The above bill of costs, taxed and allowed this 5th day of January, 1861, at fifty-four thousand six hundred and eighty-eight $\frac{00}{100}$ dollars.

JOHN CLANCY,
Clerk.

(Copy.)
H. W. GENET,
Clerk.

TOPOGRAPHICAL DESCRIPTION OF THE CENTRAL PARK, BY AREAS OF SURFACE, &c.

Length of Park, from 59th to 110th streets.....	13,507 ft. $9\frac{4}{10}$ in.
Breadth " " 5th to 8th avenues.....	2,718 " $6\frac{9}{10}$ "
Superficial area.....	843 $\frac{019}{1000}$ acres

	Acres.	Elevation of water above tide.
Area, exterior to enclosure, 59th St. Broad Walk.....	$2\frac{496}{1000}$	Feet.
Do. occupied by 4 Transverse Roads....	$9\frac{474}{1000}$	....
Do. do. new Croton Reservoir..	$106\frac{726}{1000}$	115.20
Do. do. old Reservoir.....	$35\frac{289}{1000}$	115.20
Total area of Park within enclosure, exclusive of above areas.		153. $\frac{885}{1000}$ "
		689. $\frac{034}{1000}$ acres.

	Acres.	Elevation above tide.
Area of Pond near 59th St, between 5th and 6th Avenues	$4\frac{800}{1000}$	Feet. 26.00
Do. Lake between 72d and 78th Sts...	$20\frac{167}{1000}$	53.20
Do. Ornamental Basin at Conservatory east of Lake, near 5th Avenue.	$2\frac{579}{1000}$	41.00
Do. Pool near 8th Av., between 101st and 102d Sts., <i>estimated</i>	$1\frac{717}{1000}$	45.00
Total area of waters of the Park.....	$29\frac{263}{1000}$	acres.

	Acres.
Area occupied by Carriage Roads, <i>estimated</i>	$45\frac{312}{1000}$
Do. occupied by Bridle Roads <i>estimated</i>	$15\frac{345}{1000}$
Do. occupied by Walks, <i>es- timated</i>	$33\frac{345}{1000}$
Total.....	$94\frac{000}{1000}$ "
	123. $\frac{263}{1000}$ acres.

Total area of ground, exclusive of Reservoirs, Ponds, Roads and Walks.....	565. $\frac{771}{1000}$ acres.
Area of rock surface, mainly without soil or shrubbery, <i>estimated</i> .	$24\frac{000}{1000}$ "
Area of Park ground fertilized and in trees and shrubbery, or in open lawns, exclusive of Reservoirs, Roads, Walks, Ponds, rock surface, &c., <i>estimated</i>	541. $\frac{771}{1000}$ acres.

Greatest natural elevation of surface of ground above tide—"Summit Rock," near Eighth Avenue, between Eighty-third and Eighty-fourth streets.....	136 feet.*
Least elevation of surface of ground, near Fifth Avenue, at One Hundred and Seventh street, <i>below</i> tide.....	$\frac{2}{10}$ "

The dimensions of the Park have been ascertained from an accurate system of triangulation, using the city standard in the measurements

The areas that are noted as *estimated*, apply in part to portions of the Park not completed, and are subject to modifications.

* A point of ground has been raised, by filling over a part of the rock through which the tunnel passes at the southwest corner of the old reservoir, to a height of 140 feet.

REFERENCES.

Area of Pond at A	5 Acres,
" " Lake " B	20 " ;
" " Open ground at C	10 " ;
" " " " D known as " The Green "	15 " ;
" " Ground known as " The Ramble," between Lake and Reservoir E	36 " ;
" " Open ground at F)	23 " ;
" " " " G)	

Site of (proposed) Pool, H

Length of Mall (I D) 1212 feet, width 35 feet,

Site reserved for Refectory, J

Old Arsenal proposed to be altered for a Museum, L

Terrace for a concourse of carriages N,

Site of Ornamental Water O, in connection with Conservatory K

Tunnel; Length 142 feet; width 40 feet, height 19 feet P,

Roads and Walks finished are represented in full lines
and coloured;

Do. " Do. not fully completed but in use, full lines
and lightly coloured,

Do. " Do. in progress of construction, dotted lines
and coloured lightly,

Do. " Do. not commenced are represented in
dotted lines and not coloured;

Grounds planted or in grass or ready for planting or
seeding, are coloured green,

Water is coloured blue,

Black Figures show the widths of Road,

Red Figures show the elevations above Tide water,

Red lines full or dotted, are contour lines of the original
surface, and where these are shown the ground
has not yet been broken,

Rocks that are especially prominent are indicated by
line shading,

Trees and Shrubbery are indicated in the usual manner,

The red figures on the 5th & 8th Avenues and 59th & 110th Streets,
show the elevations of the established grades,

It being uncertain whether the ground north of 106th Street
will be included in the Park, the greater portion of the plan
of the northern part is not matured, and the dotted lines
indicate a preliminary study only.

CENTRAL PARK,
OFFICE OF SUPERINTENDING ENGINEER,
Jan. 1st, 1862.

To ANDREW H. GREEN, Esq.,
Comptroller of the Park:

Sir,—In the following report will be found a detail of the works now completed or in progress on the Central Park, with descriptions of such portions as were incomplete at the date of my former report—January 1st, 1860—or as have since been prosecuted, upon plans not then fully matured or described.

Illustrations are also added, as far as it has been practicable to prepare them, to give a clearer understanding of plans and details.

The accompanying map of the Park exhibits the extent and local position of the works that have been completed, and of the portions remaining unfinished, as well as a general plan of the whole design.

The principal divisions or classes of work of the Park are as follows:

- I. ROADS AND WALKS.
- II. BRIDGES.
- III. GRADING AND SHAPING GROUNDS, *including the formation of Ponds, &c.*
- IV. DRAINING OF GROUNDS, *embracing superficial and sub-drainage.*
- V. WATER-PIPE SYSTEM, *for irrigation, &c.*
- VI. FERTILIZING AND FINISHING GROUNDS.

I.—ROADS AND WALKS.

1st. Carriage Roads.

	Miles.	Feet.	
Completed in 1858.....	..	1,200	
“ 1859.....	3	230	
“ 1860.....	1	2,870	
“ 1861.....	1	4,143	
Total completed.....	6	3,163	
Remaining to be completed to 110th street, <i>estimated</i> ...	2	1,651	
Total designed.....	8	4,814	8 $\frac{9}{10}$ miles

	Miles.	Feet.
1. Constructed upon the McAdam plan, road material all of broken stone.....	1	2,434
2. “ upon the Telford plan, sub pavement of rough stone, with broken stones on top.....	1	1,684
3. “ with sub-pavement, with a layer of broken stone first, and next a layer of gravel of about same depth on top.....	..	3,038
4. “ with sub-pavement and gravel on top.....	1	1,070
5. “ with quarry rubble stone bottom and gravel on top.....	2	217

The different widths constructed are—

	Miles.	Feet.	Crowned, in middle Inches.
1. Roads of 60 feet in width.....	1	710	9
2. “ 55 to 60 feet in width.....		820	9
3. “ 50 feet in width.....		965	9
4. “ 45 “ “.....	2	2,018	6 to 9
5. “ 40 “ “.....		680	6
6. “ 33 “ “.....	1	4,520	6
7. “ 30 “ “.....		2,910	5
8. “ 16 “ “.....		1,100	4

The grades of the roads are generally light and easy, the maximum being an inclination of one foot vertical in twenty feet horizontal.*

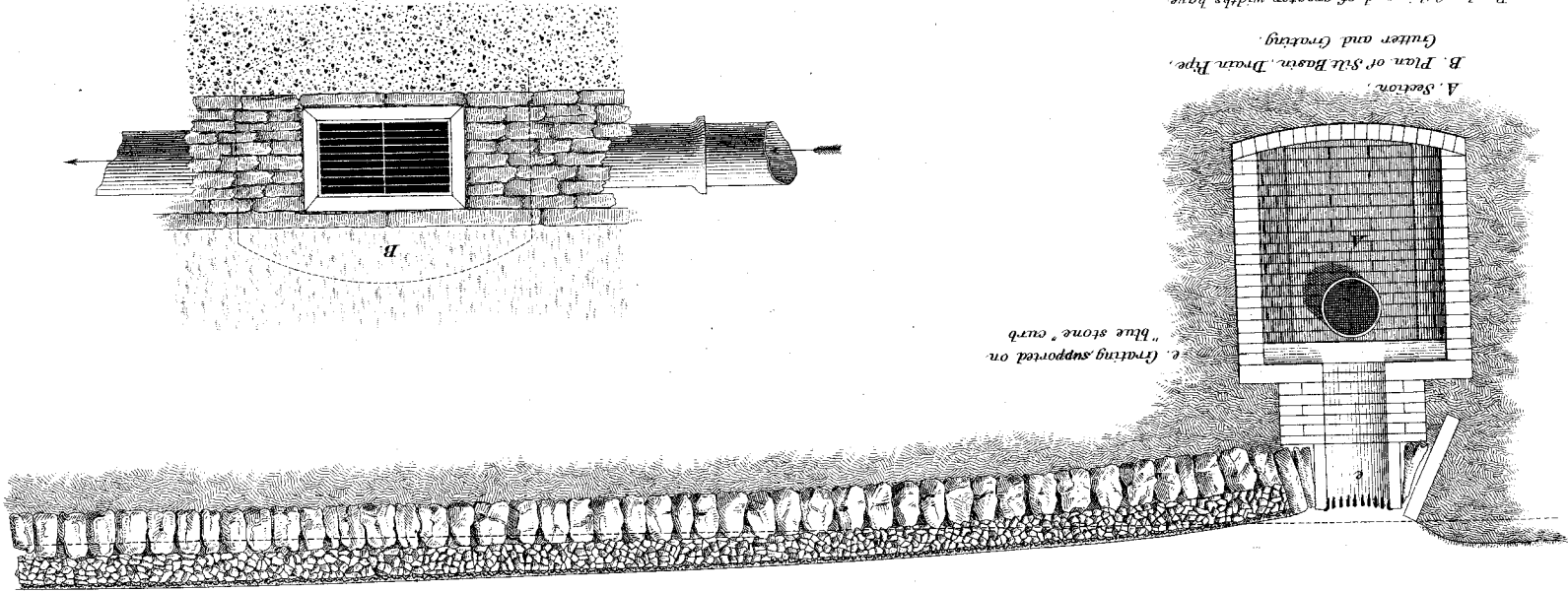
The width of the portion remaining to be built, is intended to be chiefly thirty-three feet, and the plan, that of the rubble stone bottom with gravel surface—(number 5, above.) This latter plan has generally

* There is a single exception to this, of an inclination of one foot in sixteen and a half feet, on 450 feet of the narrow lateral road communicating with Summit rock.

CENTRAL PARK CARRIAGE ROADS.

SCALE 86.
1

Half Section of Telford Road 45 feet wide.



Roads of this kind of greater widths have a drain pipe for each gutter.

B. Plan of Silt Buster, Drain Pipe, Grutter and Grating.

A. Section.

Savory, Major & Knapp Lith. N. Y.

W. B. Swan del.

been adopted since 1860, as combining economy and facility of construction with, it is believed, durability, and as perfect a surface as the more expensive modes are susceptible of.

The preliminary work in the construction of this kind of road, the formation of the road-bed, drainage, &c., is essentially the same as has been described in the former report as pertaining to the McAdam and Telford roads. The rubble stone made use of in forming the road-bottom, are such as are obtained from the ordinary rock excavations upon the Park. It is not considered necessary that they should be as sound, or as hard, or well shaped, as for a Telford pavement, but general uniformity of size is sought, as far as practicable. The general thickness of the layer is ten to twelve inches. The largest stones admissible are such as are not over nine inches in dimensions the largest way; the stones are generally rather less than this in size. They are deposited from carts over the road-bed, the stones that are too large being broken up, and the surface evenly adjusted by a little labor of the hand. The layer having been properly formed in this way, it is next surfaced by spreading over it such finer rubble or quarry chips, or scrapings and refuse of stone quarries, as are available to fill and smooth over the interstices of the surface. With this surfacing material is intermixed, as required, to give it additional tenacity or "binding" property, gravelly earth or loam, or gravelly hard pan (the latter being preferred), and the whole, being moistened by sprinkling carts, is next rolled down firmly with rollers six feet in length, thirty-six inches in diameter, and drawn by two horses. The process of surfacing and rolling is thorough, as it is important to effectually close all apertures and interstices of the surface of the layer of rubble against the admission of the gravel which is placed on the top. It is also essential that this should be accomplished without filling up the cavities of the rubble bottom, so that its cellular character may remain unimpaired to facilitate drainage, and prevent in the greatest degree the action of frost. The rolling and surfacing of the layer of stone, and the travel and working of teams upon it, together with the subsequent rolling of the gravel above, compacts and binds it so that any tendency of stones to work upward—the subdrainage remaining free, and the open character of the rubble being preserved—it is believed is well obviated. The depth and firmness, when completely rolled, of the superincumbent layer of gravel, also serves to relieve the rubble bottom from such concussions as would be liable to disturb it. The gravel is applied in two to three successive layers, making in all a depth of four to six inches. As each layer is applied, it is rolled with the lighter two-horse rollers, and after the last layer is put on, the whole is thoroughly rolled with a heavy roller weighing six and a half tons, and drawn by eight

horses.* The gravel is kept well moistened, but not too wet, while the rolling is going on.

The last or top layer of gravel is intermixed with one-fourth to one-fifth its bulk of gravelly or sandy earth, or loam, to make it bind properly. This intermixture depends upon the quality of the gravel used. Some gravel would require but very little, if any, intermixture of binding material, owing to its containing in its ordinary state an abundance, or perhaps an excess, of such material. The gravel that has been used upon the Park roads, being more than ordinarily clean and hard, bears an intermixture or adulteration of twenty to twenty-five per cent. of inferior material to perfect its binding properties. Care is to be used in well incorporating the binding material with the gravel, and also to preserve the proper proportions. An excess of binding material will shorten the process of rolling and consolidating the road, but it will be at the expense of good and durable work. Men, skilled in this particular, and in shaping, raking, and keeping true to the grade and contour lines, the final surface of gravel, are employed during the last stages of the rolling.

The whole depth of road material, rubble, surfacing material, and gravel, when fully completed and rolled, is from fifteen to eighteen inches. The roads of thirty-three feet in width—the width generally constructed during the past year—are crowned in the middle from six to eight inches. To compensate for settling and wear, which is greatest in the middle of roads while the work is new and fresh, greater crown or swell is given them in construction than it is expected they will permanently retain.

The side gutters are made of quarry stones roughly hammered to fit them compactly together. They are set in concave form, in the manner of an inverted arch, with a depression of one and a half to four inches in the middle, and are eighteen to thirty-six inches wide. The stones are from eight to twelve inches deep, and are bedded on a well-rammed layer of gravel or sand, or fine quarry chips and rubble. The "blue stone" curb, as set along the edge of the gutters of the roads first built, has been dispensed with, in those of later construction.

The roads that have been constructed as here described, and brought into use during the past season, appear quite as firm and durable, in all respects, under the service they have as yet received, as the more elaborate and expensive kinds of road with paved bottoms. They have, for the most part, been constructed on "made ground," or on ground otherwise favorably situated for forming well-drained road-beds.

In cases where such advantages, with respect to the road-beds, do not exist, some additional care and precautions in construction may be necessary.

* This roller, composed of two cylinders, is five feet in length and seven feet in diameter.

As between gravel roads and McAdam roads, the experience of two to three years in the use of the two kinds upon the Park, seems to have settled that the former are preferable for Park travel. Besides being less expensive in construction, the gravel roads—(roads with either paved or rubble bottoms and gravel surface)—are, so far as present experience indicates, less difficult and less expensive in maintenance, the surface longer retaining moisture in summer, and consequently requiring less attention in watering, and raising less dust, than McAdam roads. They are also more agreeable to travel on, both for carriages and horses, the difference being at once perceived in the greater ease of motion, and less noise from wheels, and hoof, in passing from the McAdam to the gravel road. The traction, which is usually rated higher upon gravel roads, is scarcely an appreciable element upon the easy grades of the Park roads.

No plan of road, it is believed, is better adapted to Park purposes, all things considered—cost, facilities of construction, and maintenance, &c.—than the gravel road, constructed in the best manner, with the best materials.

The portions of road of this kind constructed in 1860, (upon paved bottom) with screened gravel used in forming the last layer of the surface, have clearly surpassed, in all the more desirable characteristics, all other kinds of road that have been tried upon the Park.

The advantage of screened gravel, composed mainly of pebbles varying from about one to two inches through, is, that it gives additional uniformity and firmness to the surface of the road over gravel in the ordinary state, containing all the gradations of coarse and fine, in varying proportions. A surface of clean, hard, rounded pebbles, with just the requisite proportions of finer gravel and binding material, properly disposed, assimilates to the McAdam surface in its essential qualities, and is free from its rigidity and rough asperities. These portions of road have withstood, under constant, though not heavy travel, the heats of two summers, and the frosts, thaws, and melting snows (the latter very trying to road surfaces) of one winter without injury, with scarcely appreciable wear, or loosening of surface, or dust, and with but little attention to watering, and no repairs, being at all times smooth, firm, and even, and very agreeable to travel on.

The roads constructed during the last year have been finished without the use of screened gravel, as a saving of expense is thereby made, and so long as the roads remain in good order, as has been the case thus far, the application of screened gravel may be deferred. When they become worn, so as to require a renewal of the gravel, the screened gravel can then be advantageously applied.

As gravel performs an important part in the successful construction of these roads, it may be well to add a remark upon what are considered to

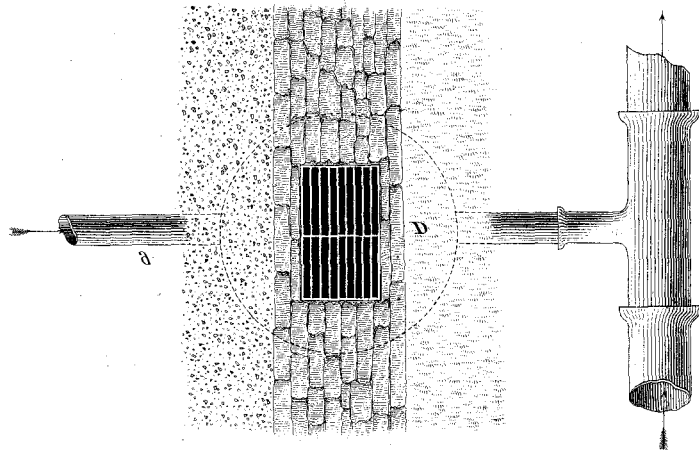
be its essential qualities. Hardness and evenness of size of the pebbles are the first requisites. The advantages derived from screening show that gravel containing the largest proportion of coarse pebbles, within reasonable limits of size, is the best. The largest sizes desirable may be limited between one and two inches through, and the nearer the whole mass conforms to or ranges within such dimensions, the better it is believed to be. But a small proportion of finer gravel and sand is desirable, the desideratum being to keep the lower portions of the stratum, when applied to the road-bed, as open and porous as practicable. The surface only, to the depth of an inch or two, requires much intermixture of finer binding material, and this, to be the most suitable, should be foreign to the gravel, not contained in it. Sameness of texture in all the pebbles and particles, is another requisite not frequently met with in gravel; this gives uniformity and firmness to the mass, aids the binding and cohesive property, and (together with evenness of size) prevents the surface from wearing irregularly, causing numerous depressions and inequalities. The shape and the degree of smoothness of the pebbles, has much to do with the consolidating process and cohesion. Pit gravel, as distinguished from gravel obtained from the beds or margins of streams of water, or the sea shore, is far preferable in this respect. Sea-shore gravel is rounded and so smoothly worn, that it cannot be sufficiently packed on the surface of a road, without too great an intermixture of inferior and earthy matter. This excessive intermixture impairs the hardness of the surface, causes dust or mud, and serves to retain moisture, and add force to the action of frost.

The best gravel is therefore, that which is hard, coarse, even, and clean, and not water-worn. These requisites will not often be found combined. Gravel that is not sufficiently coarse or even in the bulk, may be made so by screening out the finer portion. Dirt may be removed in the same way, but the process is somewhat expensive and wasteful. The most important quality, hardness—if wanting—it is impracticable to remedy. Gravel that is soft or friable or easily crushed, or disintegrated by frost, is wholly inadmissible. Color is also a matter to be considered. White or any light colored gravel, unless neutralized by an excess of intermixture of other (inferior) materials, is disagreeable to the eye, and is considered to contrast too strongly with other surroundings.

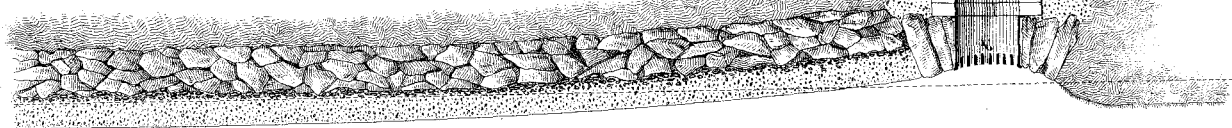
It may be added, that the gravel that has been used on the Park roads, has been found, after examination and trial of numerous other samples, to combine, in the greatest degree, the requisites that have been mentioned.

drawn, Major-General, M.I.

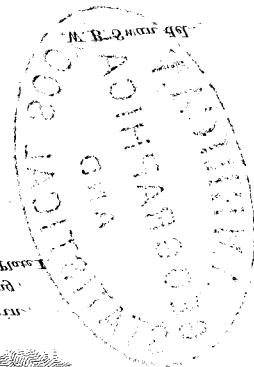
narrower roads, having one longitudinal or main drain pipe.
 3. Drain pipe from left basin on opposite side of road. This arrangement applies to the



4. Grating supported on a cast iron curb



different from the first (A B Plate I)
 Drain Pipe, Grates, and Grating.
 C. Section, D. Plan of Side Basin.



Scale 3/8

HALF SECTION OF GUTTER ROAD 33 FEET WIDE

2d. *Bridle Roads.*

	Miles.	Feet.
Completed in 1861	1	320
Mainly completed and in progress	2	2,040
Not commenced	1	4,895
Total length designed	5	1,975

The width of 2 miles and 650 feet of bridle road, south of new reservoir, including the portion completed, is..	25 feet.
The width of 1,940 feet, south of new reservoir, including the portion completed, is.....	16 and 20 feet.
The width of one mile and 3,570 feet, around new reservoir, not commenced, is.....	30 feet.
The width of the balance, 5,250 feet, north of new reservoir, mainly completed, is.....	12 feet.
The width of 1,575 feet " " "	16 feet.

The widest portions are crowned in the middle six inches, and the narrowest, three inches.

The greatest inclination at any point, is one foot vertical in twenty feet horizontal, with the exception of 410 feet of road of sixteen feet in width near the northeast corner of the new reservoir, which has a grade of one foot vertical to seventeen and a half feet horizontal.

The bridle-roads are constructed upon a plan, similar in the main, to that followed in the construction of the rubble and gravel carriage roads. The road-bed is prepared, the under drains for carrying off the surface water are laid, and the gutters built, in the same manner; the road-bottom is formed of rubble stone, and surfaced with the same care, the principal difference between the two kinds of road being in the treatment of the material above the road-bottom. The service being different from that upon the carriage-roads, owing to the absence of vehicles of any kind, the firm unyielding surface of the latter roads is not demanded.

The exact condition of the surface of an equestrian road, that is best adapted in all respects to the service, and the best materials with which to attain it, are points that have not been clearly settled, or reduced to definite rules of practice. A natural earth surface would doubtless be the best, could it be maintained at all times in uniform good condition; this, however, is not practicable.

A surface must be had that will not, as in the case of a natural road, become impassable, or greatly impaired in wet weather, nor be subject to material changes in dry weather, or by the action of frost. It is required that it should be neither too rigid nor too yielding—of such consistence as to afford the easiest movement for horse and rider, and also be adapted to economical repair and maintenance, at all seasons.

Considering that a road surface *similar to*, but *less firm*, than that of the carriage roads, would be a near approach to these conditions, and that, by the use of clean gravel and sand in its original formation, it would be most safely adapted to such modifications and improvement as might be afterwards suggested, gravel and coarse sand have been adopted, as the proper material to be employed.

The rubble bottom having been prepared, and the side-gutters laid, coarse clean gravel is put on, to the depth of three to four inches, the larger pebbles being raked forward and kept at the bottom. This is rolled sufficiently to bring it into regular even form, and to give it firmness enough to retain its even surface, while the carts and horses are next passing over it to deposit the succeeding layer. The next and last layer consists of fine gravel, or sharp coarse sand, as free from earthy matter as it is practicable to obtain it. It is spread over evenly, about two inches in depth, and the whole is again rolled, being kept properly moistened, until the surface is firm enough to bear the travel of horses without their feet sinking in it. This is as far as the process is continued, as pertains to actual construction, before the admission of travel upon the road.

The portion of the bridle road that has been opened for public use during the past season, has had, as yet, but little of regular service upon it, and a proper judgment cannot be formed as to the success of the treatment and materials made use of.

The tendency of the gravel and sand upon the surface appears to be to pack, under moderate use, quite as firmly as is desirable, without the intermixture or addition of any other material. Should this tendency become excessive, it will be remedied by renewing the surface with clean, and if necessary, well screened gravel, and with less rolling than would be done under other circumstances. Should the material become, on the other hand, too loose and yielding, the addition of a small quantity of sandy earth, or loam, with wetting and rolling, will readily counteract it. Close observation of the various effects of travel, changes of the weather, and seasons, &c., when a greater extent of road is opened, and the service increases upon it, will doubtless suggest additional improvements that will tend to perfect the material and mode of treatment.

The gutters of these roads have grated inlets like those of the carriage

roads, at suitable distances apart, to admit the surface water to the under drains; they have also, in like manner, hydrants stationed along them at distances of 110 to 130 feet apart, for convenient use in sprinkling the surface by means of hose.

3d. *Transverse Roads.*

These roads being designed for a different purpose from the other roads of the Park, have but little in common with them in mode of construction and adaptation.

Their connection with the Park consists chiefly in their crossing (unavoidably) the grounds, and involving certain modes and expedients of construction, to adapt them to the Park works, and to exclude them as far as practicable from observation.

The first or most southerly road, designated No. 1, was so far completed in the fall of 1859 as to admit of its being opened for public use, (city traffic,) at that time.

Road No. 2 was completed to the same extent in December, 1860, and both roads are now completed in all respects, except the connection of the sidewalks to be made at the avenue entrances with the exterior Park fence when the latter is built, and some additional work to be done on the roadways and sidewalks. The principal features of these two roads, and the character of the work pertaining to them, were, in the main, described in the former report. The rock Tunnel through which Road No. 2 passes, near the southwest corner of the old Croton reservoir, was completed in January, 1861, and the roof found to be sound and firm. The length of this Tunnel is 146 feet, and the height of the roof above the roadway in the center 17 feet 10 inches; the width—corresponding with the width of the road—is 40 feet.

A line of 20-inch gas-pipe has been laid under the middle of the roadway through Road No. 1, during the past year, by the Manhattan Gas Company. A 48-inch Croton main is also being laid, at a large expense, through Road No. 2, by the Croton Aqueduct Department. This latter work has been in progress since January, 1861, and will probably be finished in the early part of the ensuing spring. This Croton main proceeds from the south gate-house of the new reservoir, and passes 1,850 feet through the Park grounds, before entering the Transverse Road; it is connected by two branches, with the Park water-pipes—one branch near its junction with the Transverse Road, and the other on the extension of the main to the Eighth avenue, near the west bridge over the Transverse

Road. The main is sunk a depth generally of eight feet, and for some considerable portions of the distance, from twelve to twenty feet, in rock excavation, below the road-way.

The work of Transverse Roads, Nos. 3 and 4, is being done by contract. Road No. 3 is partially excavated and graded; one bridge, designed to carry a carriage road, bridle road, and walk over the road near the Eighth avenue, has been erected during the last year. Road No. 4 has been mainly excavated and graded, and 1,700 feet of the sidewalls built, and the face stones have been dressed for the balance of the walls. One bridge, for a carriage road and walk, over Road No. 3, and two bridges for carriage roads, bridle road, and walks, over Road No. 4, remain to be built.

The bridges and sidewalls are embraced in a contract that provides for their completion by the 1st day of October, 1862; and the earthwork, excavation, filling, &c., is embraced in a separate contract, entered into by the same parties, Messrs. Fairchild, Walker & Co., and is to be completed by the 31st day of March next. The latter contract includes the grading and shaping of the large bulk of surplus materials that were removed and deposited upon the Park grounds from the site of the new Croton reservoir, by the Croton Aqueduct Department, together with other earthwork embraced in the district of the Park lying between Eighty-fourth and Ninety-eighth streets.

The character of the work done and remaining to be done, on Roads Nos. 3 and 4, is substantially the same as that on Roads Nos. 1 and 2, which was described in former report. The bridge masonry has been so far modified as to leave the face, or outer exposed surface of the stonework, undressed, or "rock-faced." The sidewalls have been reduced from the general height of 8 feet to that of 7 feet, and the cost has been modified in some other respects without impairing the quality of the work.

The aggregate length of the four transverse roads is $4\frac{1}{10}$ miles, the width 40 feet, which includes a roadway of 28 feet, and two sidewalks of 6 feet width each. The greatest inclination of roadway is one foot vertical in $22\frac{1}{2}$ feet horizontal. The road surface is intended to be formed of rubble stone, evenly surfaced, and thoroughly drained by road gutters, with ample inlets to under-drains. The sidewalks, one or both, as the service may require, to be flagged in the middle.

Some further details of the bridges and drainage will be given hereafter, under the appropriate heads.

4th. Walks.

	Miles.	Feet.
Completed in 1858.....		3,500
“ 1859.....	7	1,320
“ 1860.....	1	2,604
“ 1861.....	5	3,335
Total completed.....	15	199
Remaining to be completed.....	7	4,341
Total designed.....	22 $\frac{9}{10}$	....

The widths of the walks vary from $3\frac{1}{2}$ to 16 feet. The Mall, 1,212 feet long, is an exception, being 35 feet wide.

The narrower walks are chiefly limited to the Ramble district.

The method of construction has not varied materially from that formerly described as having been employed previous to 1860; but the work has generally been done at reduced cost, by less labor being applied in the preparation of the rubble-stone bottom, and less gravel being used in forming the surface.

By additional attention to surfacing the stone with such suitable materials as can generally be had, less labor is necessary in breaking the surface stones of the foundation to small sizes, and gravel is economized by being more completely retained upon the surface.

From one to two inches in depth of fine, hard gravel, is all that is found necessary to apply to the surface, until the walk has been some time in use. Loam is lightly intermixed with the gravel, to make it bind properly when moistened and rolled. Care is to be used not to apply the loam in such excess as to encourage the growth of grass; the same precaution is necessary as to the gravel, which should be as free from dirt of all kinds as possible. Any impurities impair its value, and make the walk dusty in dry weather, and muddy or slippery after rains, and augment the action of frost. The dark slate gravel that was used previous to 1860 has not proved sufficiently durable; and the harder and sharper gravel, of a somewhat lighter shade of color, has taken its place.

The chief difficulty in keeping the walks in repair arises from the washing of the surface by water gathered during rains from the adjoining grounds. This difficulty is only to be obviated by—either the usual expedient of constructing gutters along the walks, or—that of intercepting and diverting the water before it reaches the walks. Paved gutters of the ordinary kinds have been considered objectionable on account of their formal ap-

pearance; besides, they necessarily occupy a considerable portion of the width of the narrower walks, diminishing the intended capacity or foot-way; and they add, also, a material item of expense to a walk, that it is desirable to avoid.

For these reasons, the expedient of diverting the water from the walks, by means of catch-water drains, or, as they are termed on the Park, "sod-gutters," has been resorted to. It has been generally applied during the last two years, where the situation of the grounds and walks would admit of it. These gutters are formed by sinking the turf alongside and parallel with the borders of the walks, in the shape of a broad groove, made as little conspicuous as possible; the bottom having a regular descent, without depressions that would lodge silt or form pools of water. The work is comparatively inexpensive; but, in the full adaptation of the gutter to the object, it involves the necessity, in most cases, of accompanying under-drains. Where it is practicable to discharge the water from the sod-gutters, in suitable places upon the surface, without detriment, and where under-drains constructed for the roads or other purposes are conveniently accessible to receive the water, the special under-drains are omitted. But few opportunities are afforded, however, of disposing satisfactorily of accumulations of drainage water in this manner, and the necessity of constructing special under-drains for the walks, therefore, becomes imperative. Whether the ordinary walk-gutter or the sod-gutter is adopted, this necessity is practically the same. The operation of the sod-gutter is, to receive the principal amount of drainage-water that would otherwise be carried upon the walks, and to transfer it to the under-drains through proper grated inlets, that are regulated in size, or in distances apart, by the area of ground drained. The water falling upon the surface of the walk only, is gathered along the depressed edges of the gravel, which act as partial gutters, and is either passed through trenches or depressions in the borders of the walk, to the sod-gutters, or is admitted through grated inlets, placed at suitable distances apart, in the edges of the walk, to the under-drains, in the same manner as in the sod-gutters. Turning the water from the walks through numerous notches in the sod-borders, is so objectionable, that the walk inlets are generally adopted.

Where it happens, from the conformation of the ground, that sod-gutters cannot be conveniently constructed, and the drainage is not excessive, the case is met, to some extent, by placing the walk inlets closer together, but generally, under such circumstances, gutters become necessary to prevent abrasion and gullyng of the walks. Where rock occurs near the surface, it is frequently impracticable to construct, either sod-gutters or under-drains, and in such cases substantially formed gutters of ample capacity, along the

edges of the walks, have been added during the last season where the walks had the most inclination, and the necessity in other respects was most apparent.

They are formed of small-sized cobble-stones, set neatly and compactly by hand upon a bed well prepared of rubble and gravel. The stones used are the refuse thrown out in screening or raking the gravel for the roads and walks, and are well suited to the purpose, and have the advantage of being of the same color as the gravel. Some of the steeper portions of the narrow walks, most needing repair, have been paved the whole width with these stones, producing a good effect, and a durable surface, at a moderate expense. The stones being quite small, and the interstices well filled with sand, the surface is tolerably smooth and even.

The plan of sod-gutter drainage has been extended beyond its immediate connection with the walks, to road and general surface drainage, which will be further described under the head of surface drainage.

In investigating the subject of walk drainage and gutters, experiments have been tried in order to ascertain if some better, or cheaper, or less objectionable description of gutter, could be devised than those in common use. Although the results attained have not been such as to warrant the adoption in practice of any of the kinds of gutter experimented upon, yet they may possess sufficient interest to be worthy of mention. The principal kinds were as follows :

1. Cement or concrete gutter.
2. Composition “
3. Iron “
4. Wood “

Nos. 1 and 2 were open gutters ; No. 1 was composed of two parts of gravel and sand and one part of cement, laid on a filling (adjoining a walk) of broken stone and gravel of about nine inches in depth. The concrete was deposited two to three inches thick, and moulded by the aid of a wooden implement drawn over it, into the desired gutter form. The gravel of the walk and the sod border were adjusted to it on either side, and completed the process. The gutter was comparatively cheap and easy of construction, and appeared in all respects, as regards utility, well adapted to the purpose. After exposure to the weather for a time, it became lighter in color than the gravel of the walk, though it was composed of the same kind of dark-colored gravel. This was owing to the cement contained in it.

The objection to it at the time of the trial (1859) was the uncertainty

of its durability, together with the general objection to all open gutters—that it gave too marked and formal an outline to the walk. The sample is still in its original position; it has improved somewhat in respect to color, and has been but little affected by changes of weather or frost, or by wear during nearly two and a half years.

No. 2. Composition gutter—was made in a similar manner to No. 1 as to form and dimensions, but the materials used and its manipulation were not disclosed by the gentleman who introduced the sample upon the Park and supervised its construction. The principal defect of this gutter seemed to be, the contraction of the material of which it was composed, which separated, on exposure, into broken sections, the action of frost and other causes tending to increase it and to displace the parts. It was also open to the general objection mentioned to all formal gutters.

No. 3. Iron gutter—was made of light sheet iron, in sections of U form, with a perforated movable lid or cover. The design was to make it a concealed gutter, by sinking it along the edges of the walk and covering the top over with a light layer of gravel—the surface water to percolate through the gravel and the perforations in the lid, into the gutter, and thence pass on as through a pipe. This sample, as far as tried, indicated that it might be made to operate well in ordinary cases of moderate drainage and not too great inclination of the walk, but it was considered to be subject to too many contingencies for general use.

No. 4. Wood gutter—was constructed upon the same principle as No. 3, as a substitute of wood for iron, for greater cheapness. It was a mere wooden trough with a perforated lid, the wood having been subjected to a process to give it greater than ordinary durability. It was apparent that it was inferior to the iron gutter (though much cheaper), and its general want of adaptability was considered as decisive against it.

A method of macadamizing gutters, of the common (open) form, was tried in order to obtain a gutter that would blend better than ordinary paved cobble-stone gutters with the gravel of the walk, and not present the usual contrasts of color and kind of material, but it was found impracticable, by ordinary means, to give the materials sufficient compactness and cohesion to resist long the action of a current of water. The same process was tried for the surface of a narrow walk, on steep ground, where it was difficult to make the gravel remain during rains, and with the same results.

These experiments (considering them as failures) serve to show, that the safest, and probably the most practicable means, that can be adopted for the drainage of walks are such as have been gradually brought into use upon the Park, in the manner that has been previously described.

II. BRIDGES.

The Bridges of the Park are of three classes, viz :

1st. *The Transverse Road Bridges*—which are bridges solely of utility, built in a plain manner, devoid of ornament and not intended to be seen, or to be conspicuous objects from the Park. These are made of ordinary sound and durable stone and brick.

2d. The bridges for the carriage roads, bridle roads, and walks of the Park—which, being necessarily brought into view and forming a part of the general landscape of the Park—are appropriately designed and designated as *Ornamental Bridges* or *Archways*. These are constructed in all respects, except the face or exterior work, in the same general manner as the other bridges, but the exteriors are formed of different kinds of selected stone and brick. Some of the bridges in this class have abutments of stone, and superstructures of iron. One bridge belonging to this class has a superstructure of wood, and one stone arch, though built in a rustic manner, being for a carriage road over the bridle-road, is put in this class.

3d. The smaller class of bridges for walks, and over streams, ravines, &c., are *Rustic Bridges*, and the materials used in their construction are chiefly wood.

1st. *The Transverse Road Bridges.*

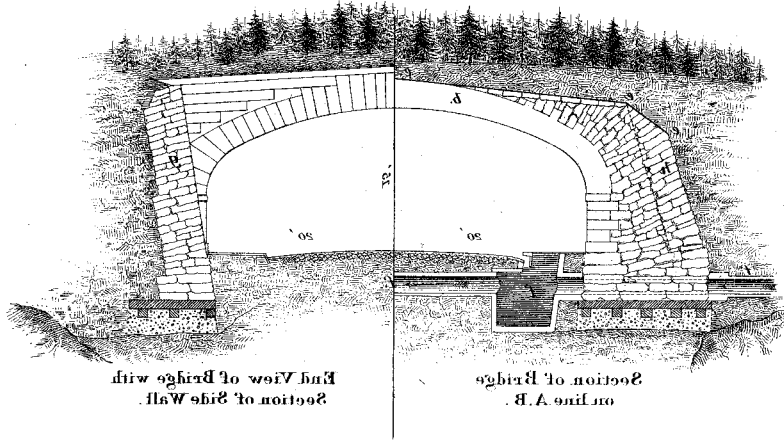
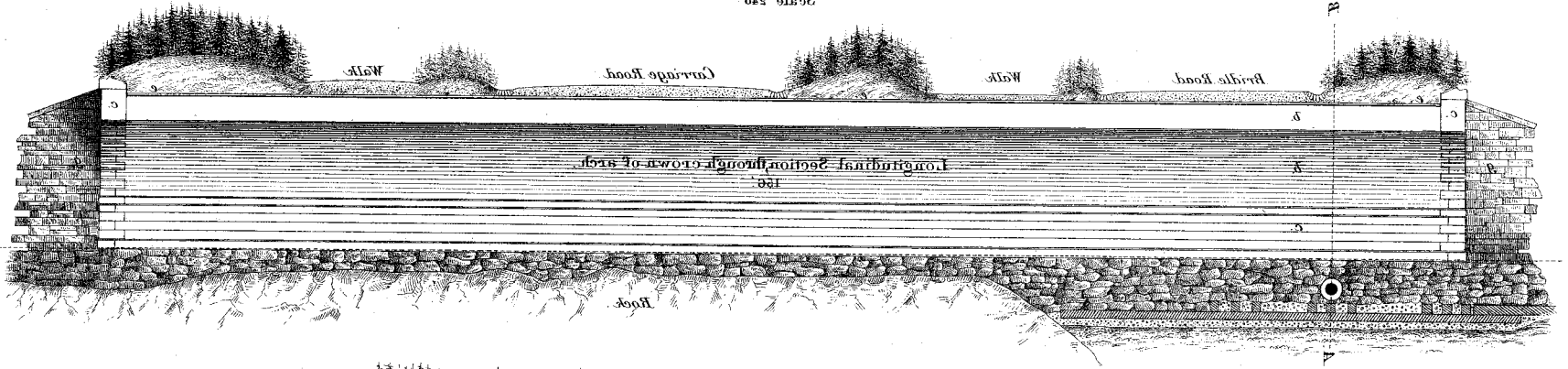
The following tabular statement gives the principal details of the plan, dimensions, &c., of these bridges :

Designation of bridge.	Transverse Road No.	DATE OF COMPLETION.	Span of Arch.	Height of arch at crown above Transverse Road.	Rise of arch above the springing line.	Extreme length of bridge.	Greatest depth of foundation below base of super-structure.
A.	1	November, 1859.....	Feet. 40	Feet. 14.9	Feet. 9.8	Feet. 171.0	Feet. 2.0
B.	1	November, 1859.....	40	"	"	130.0	3.0
C.	1	September, 1860.....	40	"	"	50.0	3.6
D.	1	November, 1859.....	40	"	"	130.0	3.0
E.	2	September, 1860.....	40	"	"	156.0	9.0
F.	2	October, 1860.....	40	"	"	126.6	6.6
G.	2	July 1860.....	40	"	"	80.0	3.0
H.	3	November, 1861.....	49	"	9.8	112.0	9.5
I.	3	Not commenced.					
J.	4	Do.					
K.	4	Do.					

Note.—The "capital" letters refer to the bridges upon each Transverse Road, in their order from west to east, as, bridge A, west bridge of Transverse Road No. 1, B, next west, &c.

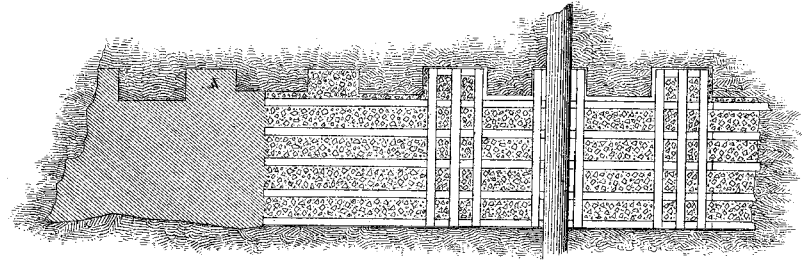
BRIDGE "E" OVER TRANSVERSE ROAD No. 2.

Scale 1" = 20'



End View of Bridge with
Section of Side Wall.

Section of Bridge
on line A.B.



Plan of a part of the Foundation.

a. Concrete.
b. Side walls.
c. and fill between.
d. Section of sewer road inlet
e. e. e. (bottom of asphalt).
f. Stone & brick.

Drawn by Major B. Knapp, N.Y.

W. B. Zuercher del.

All of these bridges from A, to H, are completed. Bridge I, the east bridge of Transverse Road No. 3, and Bridges J, and K, of Road No. 4, have not been commenced. These three last-mentioned bridges are embraced in a contract with Messrs. Fairchild, Walker & Co., and are to be completed by the 1st day of October next.

The transverse road bridges are the heaviest class of bridges, and are the heaviest structures of masonry (with the exception of Bridge No. 1, and connected terrace work) on the Park. The principal features in their construction are, the care that has been necessary in preparing the foundation, and their adaptation to the general design, pertaining to the transverse road work—that of being screened from observation from the Park.

But little uniformity prevails in any part of the Park in the character of the subsoil and the deeper underlying material. Rock generally exists at very variable depths, but where it is met with in the excavations, it is very irregular in shape and scarcely ever is found, at the bridge sites, continuous throughout the extent of the structure, at a practicable depth to be reached and directly built upon. The surface, in most cases, either drops off at an inconvenient point, with an abrupt descent into a bed of clay, boulders, hard-pau, or quicksand, or all of these more or less combined, or shelves away into a decomposed, micaceous, soft, and slippery material. A foundation of uniform stability is obtained with some difficulty, under such circumstances. Where no rock occurs, the difficulty has generally been less, and the labor and expense also considerably diminished. The foundation of Bridge E, Transverse Road No. 2, is in the deepest part, 9 feet below the base of the superstructure; the foundation is, in the main, on rock, but near the west end the rock dips rapidly and disappears under a deposit of boulders and quicksand.

Piles could not be driven to complete the foundation on account of the boulders, and they would not have answered the purpose if it had been practicable to drive them, owing to the sloping surface of the rock. In this case, after excavating the earth and following the rock down a sufficient depth, a strong grillage or platform of timbers, disposed crosswise over each other in two courses, was laid down with one end resting upon the rock, and the other portions resting upon the bed of boulders and quicksand. The timbers were bedded on a layer of concrete, and the spaces between them were filled in with the same material, and well rammed; over the timbers were laid large broad stones, and upon these the regular foundation masonry was commenced. The depth at which the timbers were placed was sufficient, not only to secure their durability, being safely below the line of permanent saturation, but also to give room for a sufficient mass of foundation masonry above, to bring the whole to a firm and

final bearing before adding the superstructure. The other bridge foundations that were partly on rock, and partly on earth, have been treated in a manner similar to this, though timber has been dispensed with in other cases.

Foundations wholly on earth have been sunk not less than three feet in any place below the original surface of the ground, and such greater depths as have been necessary to reach a firm and uniform character of material. This applies, not only to the transverse road bridges, but to the ornamental bridges to be hereinafter described. Only one of the bridges of the latter description that has been built upon earth foundation, has required other precautions. This bridge, designated No. 6, for a carriage road over the bridle-road, is situated upon a former swampy piece of ground. The surface material was of clay and sand, and was firm to the depth of five or six feet, and next below, for a few feet, it was less firm until it became apparently quicksand. The surface was not deemed unsuitable for an ordinary foundation, but it was apprehended that the weight of the bridge might produce the effect of heaving up the material between the abutments where no counteracting weight was brought to bear. To obviate this, an inverted arch was laid between the abutments. This arch was so constructed, that the weight or pressure of the sidewalls was not brought upon it until they were carried up to near the springing line of the bridge arch. This was done to enable the sidewalls to settle upon their foundations, and take their bearings, as far as practicable, independently of the inverted arch. The connections were made between the sidewalls and the inverted arch at the proper time, by inserting in the narrow spaces that had been left for the purpose, thin, hard "blue stones," (as keystones) and wedging and filling up all interstices with slate and grout. The foundations of the sidewalls were prepared by bedding large broad stones on a layer of concrete, at the depth of the underside of the inverted arch.

An objection to the use of piles in the foundation in this case, had they been considered necessary to stability, was, that the ground was under-drained to too great a depth to ensure their durability, by a sewer that had been constructed in the vicinity. Besides, the cost of a pile foundation would have been much greater than that of the plan adopted.

In carrying up foundation masonry on rock, or partly on rock, concrete has frequently been made use of to a considerable extent. This material is composed of sound broken stone (in sizes not over two or two and a half inches the largest way) intermixed with hydraulic mortar, in the proportions of thirty cubic feet of stones to two barrels of sand, and one barrel of cement. Coarse gravel is sometimes substituted for the broken stones. This material is used to fill up the deepest cavities and depressions of the

rock, and is occasionally continued in regular horizontal layers over the foundation. It is put down in layers of six to nine inches in depth, and thoroughly rammed. To economize the material where it is employed in much depth and extent of area, large stones are imbedded in it, in alternate layers of concrete and stones. The whole mass, when the cement has set—which rapidly takes place—becomes an artificial rock, which gradually acquires the firmness and stability of most natural rocks.

The transverse road bridges are made, such additional length beyond that required for the roads and walks over them, as is necessary to afford room for shaping and planting the ground at the ends, in such manner as to screen the bridge-work and transverse roads from view, from the Park.

These bridges are further characterized by general uniformity of plan, and external appearance. The masonry is of a substantial and enduring kind. One bridge on Transverse Road No. 1, being designed to carry the Transverse Road *over a walk*, is an ornamental bridge, and will be embraced in the description of bridges of that class.

2d. Ornamental Bridges.

The details of dimensions, &c., of all ornamental bridges completed, nearly completed, or designed, are given in the following tabular statement:

No. of Bridge.	Date of Completion.	Kind of Materials,	Span of arch, or width between abutments.	Height of arch or girders above road or walk.	Rise of arch above springing line.	Extreme breadth of bridge.	Length of balustrade.	Greatest depth of foundation below base of superstructure.
			Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
1	*	Terrace bridge, iron girders.....	29 0	16 0	.. ..	.. ..	.. ..	3 3
2	1859	Stone and brick.....	24 0	11 0	3 11	65 0	79 8	3 6
3	1860	Do.	14 0	9 10	2 0	47 6	60 0	4 0
4	1859	Stone.....	27 0	11 6 Water.	10 5	65 1	100 0	2 3
5	1860	Abuts. stone; bridge iron.....	87 4	9 6 Water.	8 4	15 8	142 10	6 9
6	1860	Stone and brick.....	24 0	11 0	3 11	80 0	76 11	8 0
7	1860	Stone.....	37 3	14 0	12 2	47 0	130 0	7 0
8	1860	Stone and brick.....	29 6	10 0	8 0	50 7	95 1	5 3
9	1861	Stone.....	15 4	10 6	2 3	75 11	88 8 58 8	3 0
10	1860	Abuts. stone; bridge wood	55 11	6 5 Water.	.. ..	14 0	73 0	3 7
11	1860	Stone and brick.....	25 0	13 3	2 8	81 3	101 6	5 0
12	*	Abuts. stone; iron girders.....	19 3 15 10	11 9	8 1 6 4	66 0	110 9	11 0
13	*	Stone and brick.....	30 6	10 1 1/2	8 10	80 3	100 2	10 0
14	1861	Do.	17 8	9 11	6 12	66 0	63 0	3 0
15	1861	Abuts. stone; bridge iron.....	60 0	11 0	3 0	15 10	85 6	2 0
16	*	Stone and brick.....	15 6	11 7	2 4	150 9	27 8	4 0
17	*	Do.	45 6	12 3	10 6	53 8	65 0	7 0
18	1861	Rustic, stone arch.....	30 0	11 9	4 8	00 0	.. ..	2 0
19	1861	Cast iron arch.....	25 0	12 6	7 9	14 7	88 10	3 6
20	1860	Rustic, stone.....	5 0	13 6	2 6	9 0	32 0	1 0
21	1859	Rustic, wood.....	10 10	2 4 Water.	.. ..	15 7	21 5	2 0
22	1860	Rustic, wood.....	13 5	5 4 Water.	.. ..	13 3	34 6	2 0
23	1861	Stone and brick.....	18 3	11 3	7 11	56 0	.. ..	5 7
24	Not com'd	Do.	17 6	10 5	7 0	68 0	.. ..	.. ..
25	Do.	Abuts. stone; bridge iron.....	17 5	9 2	6 5	71 0	.. ..	.. ..
26	Do.	Stone and brick.....	36 0	11 6	7 3	15 2	51 0	.. ..

* Mainly completed and in use.

Two of these bridges, Nos. 2 and 4, were completed previous to 1860, and five other bridges, Nos. 1, 3, 5, 6, and 7, were about completed—only the balustrades remaining to be added, at that time. As these were noticed in the report of that date, reference will be made here, chiefly to the bridges of later construction, and to such parts of plans and details, as require further description to develop their characteristics.

The general treatment of the foundations has been indicated in describing the transverse road bridges. The main bulk of the masonry above the foundations, is that which composes the interior work, or backing and filling-in of the bridges, and is of the general character of compact, strong rubble work, laid in hydraulic mortar. The stone for this portion of the work, is mostly obtained from the Park excavations. The brick are common, well-burned, strong brick, selected carefully, and of better than the average quality used for ordinary building purposes.

The face-work of the bridges is composed of various kinds of finer qualities of stone and brick, and is a different and superior style of work, and is necessarily constructed with greater care.

The combination of these different materials and workmanship, constitutes the distinguishing feature in the construction of the ornamental bridges.

In ordinary structures of masonry, where utility alone is regarded, and in which the materials are of a single and homogeneous kind, the work is comparatively simple, and needs no unusual care. A slight oversight in perfecting a joint or a bearing, in such work, is not apt to be a serious matter, nor liable to mar or deface the exterior; a stone or a brick may not always be placed just in one position and no other, and still serve the purpose sufficiently well; but in these bridges such details and numerous others cannot be neglected without serious detriment—their omission would affect not only appearances, but substantial construction.

The facings of the bridges are of stone differing in quality, texture, and degree of hardness, from the stone to which they are joined in the interior of the walls, and they are also "dimension stone" having been shaped out in the quarry, and transported to the work, in prescribed forms and sizes—the sizes being, as to breadth of bed (or the depth the stone is to build in the wall), the least that is in any case admissible. These peculiarities render it difficult, in carrying up the walls, to combine the two classes of interior and exterior work, so as effectually to prevent liability to separation, and to give equal and proper bearings to all the parts.

Where the work is so situated in any part, that this cannot be done by the careful adjustment of bonds and ties in the ordinary manner, flat, strong "blue stones" are made use of. These are bedded equally upon

the front and the interior stones, and form strong and durable ties. Iron bars, suitably shaped, are also used for ties and dowels where it is inconvenient to insert blue stones. The iron is well coated with copper, by the electrotype process, or with asphalt and mineral oil, before being used, to prevent oxidation. The brick facings are bonded with other bricks in the rear, and those again are bonded with the stone-work adjoining. Bricks have been used for facings (except of arches) in but two of the bridges—Nos. 2 and 3. All but three of the arched bridges that have been built—excepting the iron bridges—have brick arches of common brick, faced, with one exception, with superior pressed “front brick.”

One of these three bridges (No. 7), under Transverse Road No. 1, near the Fifth Avenue and over a walk, has an arch of New Brunswick stone, the bridge being faced throughout with the same kind of stone; and one bridge (No. 9), has an arch and facings throughout of white marble. The other bridge (No. 4), has an arch of gneiss, closely resembling granite, found on the Park.

The arch of Bridge No. 2, is faced with hard, well-shaped, common brick. The outer ends of all brick arches are finished with stone “rings.”

The brick used for the facings (excepting arch of Bridge No. 2, as mentioned) is mostly Philadelphia pressed front brick, with some Milwaukie brick of the same quality that has been employed in three of the bridges.

The latter brick is of a cream or buff color, and has been used only in connection with the Philadelphia (red) brick to variegate the work.

The different varieties of stone used in the facings and trimmings are :

1. Granite from the State of Maine.
2. Hudson River “Mountain Graywacke.”
3. A species of light-colored gneiss resembling granite, obtained on the Park.
4. Westchester County variegated gneiss.
5. Do. do. white marble.
6. New Brunswick olive-colored freestone, from Albert quarry.
7. New Jersey dark red or brown freestone.
8. New Brunswick, from Dorchester quarry.
9. Do. Weston do.

These varieties of stone are used singly in some bridges, and combined in others, three different kinds being the most that are used in the same bridge.

The following statement shows the kinds of stone and brick facings and trimmings of each of the principal bridges that have been built, or that are in progress, or for which designs have been prepared.

Facings of arch are abbreviated to, *face. arch* ; facings of wall or abutments under arch, to *face. abuts.* ; facings of ends or fronts of bridges, to *face. fronts* ; trimmings, to *trims.* ; balustrades to *bals.*

No. of Bridge.	KIND OF STONE.	KIND OF BRICK.
1	New Brunswick, as far as the work is done; other kinds of stone to be added.	Common brick used in the interior arches.
2	New Brunswick trims. and bals.	Com. brick face. arch and abuts.; Phila. face fronts. Phila. face throughout.
3	New Brunswick trims., bals. cast iron.	
4	New Brunswick trims. and bals., face Park gneiss (resembling granite) throughout.	None.
5	Wrought iron girder bridge, with cast iron trims. Abuts. faced with N. Bruns'k stone.	None.
6	New Brunswick face. fronts, trims. and bals.	Phila. face. arch and abuts.
7	New Brunswick face. throughout and bals.	None.
8	Do. do.	Phila. face. arch.
9	Marble throughout; bals. cast iron.	None.
10	Wooden bridge; abuts. Park gneiss.	None.
11	New Brunswick face. throughout and bals.	Phila. face. arch and abuts.
12	Wrought iron beams; stone-work faced with stone.	Common brick in interior arches.
13	Westchester Co. face.; N. Bruns'k trims. & bals.	Phila. face. arch.
14	Maine granite trims.; bals. cast iron.	Phila. & Milw. face. throughout.
15	Wrought iron girder bridge; abuts. of Park gneiss.	None.
16	Maine granite face. and trims., from the Rad-cliff Island quarry; bals. cast iron.	Phila. face. arch.
17	Maine granite face.; New Brunswick trims.; bals. cast iron.	
19	Cast iron arch and trims.; stone foundations all under ground.	Phila. & Milw. face. arch.
23	North river and New Jersey face.; New Jersey trims.	None.
		Phila. & Milw. face. arch.
24	<i>Not Commenced.</i>	
25	N. Brunswick and N. Jersey stone.	Common brick in arch.
26	North river face. abuts., bal. iron.	Common brick in arch.
	North river face.	Arch cast iron.

The relative hardness of these different stones is shown in the order in which they are named from 1 to 9, page 84, No. 1 being the hardest No. 2 next hardest, and so on.

The relative specific gravity is in the following order, No. 1 being the highest.

1. Westchester Co. white marble.
2. Hudson River "Mountain Graywacke."
3. Park gneiss, resembling granite.
4. Granite from State of Maine.
5. Westchester Co. variegated gneiss.
6. New Brunswick freestone, from Dorchester quarry.
7. Do. do. Albert do.
8. Do. do. Weston do.
9. New Jersey, do.

The relative degrees of hardness have been ascertained in dressing the stone, and are here stated according to the judgment of the stone-cutters employed. The relative specific gravity is ascertained by the weight of equal bulks of stone of the several kinds.

The qualities of strength and durability are not governed exclusively by hardness and specific gravity or density, being dependent also upon the cohesion of the particles of the stone by the natural cement contained, freedom from metallic oxides, &c. No experiments have been tried in these respects, as the general character of the most of the stones has been long well known, and a reputation derived from long actual use is considered the safest and best.

The completeness of finish externally, of these bridges, depends very much upon the treatment they receive in the cleaning down, and the pointing of the joints of the stone and brick work, after the removal of centers and staging. The employment of acids in the operation of cleaning, which is quite common with builders, is believed to be dangerous and should be avoided. The proper pointing of face joints is essential, not only to a neat finish but to durability, and as it involves a considerable amount of very judicious labor, it is a subject deserving of mention. The usual mode of proceeding is, to scrape off with a trowel or other implement the more prominent scraps of cement adhering to the face of the work, and then wash down the remainder with strong acids in various degrees of dilution, then to rake out the cement in the joints, more or less thoroughly, and point up the joints in a neat, but really very superficial manner. The labor involved is so great, to remove the cement properly from the joints, that it is seldom done. To avoid the superficial character of the work, great pains were taken preparatory to pointing the first of the bridges constructed, to dig out, with various implements devised for the

purpose the cement in the joints, to such a depth as would give a better hold and more body to the pointing material. The operation was tedious and expensive, the cement being very hard, and, besides, the workmen chipped and marred, unavoidably, the sharp corners and clean lines of the joints of the stone and brick. A resort to a simple process in construction, during the laying of the face stone and brick, was subsequently found to remedy the whole difficulty in a very satisfactory manner. The process consists in the use of a small steel implement, or "gauge," which is applied at the front edge of a brick or stone that has been laid, to keep back the fresh mortar from filling the joint (or space intended for pointing) while the contiguous brick or stone is being set. The gauge is made the exact width desired for the vacancy which is to be occupied by the subsequent pointing, and the thickness is adapted to the thickness prescribed for the face joints of the work; hence it performs the double service of stopping the mortar in the manner desired, and of regulating and equalizing or "gauging" the joints of the work. The gauge is made usually, for face work, about $\frac{2}{8}$ ths of an inch wide and $\frac{1}{8}$ th to $\frac{3}{8}$ ths inch thick, and in the follow-

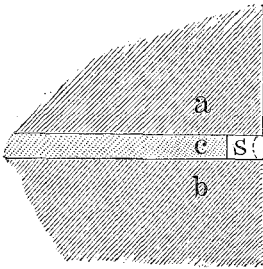
ing form :

the shorter limb being held in

the hand in placing it, and also in withdrawing it from a joint. The length of the longer limb is regulated by the length of the stone or brick for which it is to be used, several gauges being necessary of different lengths, long ones for longitudinal or bed joints, and short ones for vertical or end joints. In ordinary vertical face work it is held in place by the hand, upon the last stone that has been set, while the bed of mortar is spread and joined up to it, and is kept in position until the next stone is set in contact with it, and is then carefully drawn out. In arch work it is laid in place, resting against or upon the centering (the false work upon which the arch is built), and remains there as in the other case, until the mortar is spread and the next stone or brick is laid. When it is withdrawn it leaves a clean open space of uniform depth for the subsequent pointing, and, if proper care has been observed in bedding, a joint truly gauged in thickness and exactly corresponding with all the other joints of the work.

In setting stone or brick in arches, the use of this implement effects a material saving in expense, as well as affording the means of doing the work in a superior manner. The centering of an arch shuts out of view the face-work as it proceeds, and it is impossible to know whether or not it is done in the best manner until the arch is closed and the centering removed, when it is of course too late to remedy defects. With great care

on the part of the mason the joints *may be formed* with tolerable regularity, in the ordinary way, but they will be left filled with mortar that must subsequently be scraped away by a tedious and expensive operation. In vertical walls where the face is free, it is practicable to scrape out the joints as the work proceeds, while the mortar is fresh, and thus adapt them to successful pointing; but no expedient of the kind is applicable to arch work. An intelligent and skillful foreman of masons, who has done some of the best work on the Park, says, in regard to the use of the gauge: "A mason will lay more brick with gauges than he will without, and lay them as they should be laid. If they are laid without gauges, it will take a mason ten hours to clean, ready for pointing, fourteen superficial feet of face; if laid with gauges, he will clean from forty-five to fifty feet in ten hours. You will see that it costs less, and makes a better job to use the gauges."



This statement refers to arch work of brick. The space left in the joints, by the use of the gauge, is represented by the following sketch: *a* and *b* being the stones; *c* the mortar between the stones; and *s* the space for the pointing material. The form of the space, as ordinarily obtained by scraping out the mortar after it has become hardened, is represented by the dotted curved line.

It results, necessarily, that the pointing put in, or rather *on the joint*, when scraped out, as shown by the dotted curved line, can have but very imperfect cohesion, and must, sooner or later, fall off, defacing the work and exposing the joint to the admission of water, until the pointing is renewed.

The materials that are employed in pointing are usually hydraulic cement, and fine hard, sharp, and clean sand, in equal proportions. If the pointing is required to be of light color, white sand is used, with, occasionally, quick-lime intermixed with the cement, on account of the lime being lighter in color than the cement. Care is used, if the sand is obtained from the vicinity of salt water, to wash it or bleach it before it is brought upon the work. Oil putty, and various other substances that are employed sometimes for pointing, and which, it may be observed, are employed with great facility, and give a neat finish, are not considered as well adapted to the masonry of bridges as mortar of cement and sand.

It is an essential part of the construction of the Park bridges to make them impervious to water.

Passing, as they do, over walks and roads, it is desirable that the interiors should remain as free as practicable from moisture and dampness.

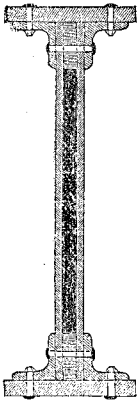
Strict rules are enforced requiring the beds and joints of stones, and all interstices of the work, in all its parts, to be filled flush with mortar during its progress. Beyond this, the plan has been to thoroughly drain the rear of arches and abutments, and to coat the surfaces most exposed to moisture from contact with the earth, with asphalt. In some bridges, the additional precaution has been taken of constructing, in part, hollow walls. The surface of the roads and walks over the bridges, and of the grounds adjoining, is also shaped so as to drain surface water away from the bridges. It is not practicable to determine, in new or recently built work, how well the remedies employed against dampness may succeed. Masonry in much bulk, and surrounded by earth, retains its original moisture a considerable length of time. Entire freedom from dampness, proceeding from absorbed moisture, and from condensation upon the surface of the walls, has not as yet been fully attained, except in the case of the hollow walls. It is not to be expected that, where hollow walls do not exist, an entire exemption from dampness will result; but so far as any inconvenience can arise from it, it is believed to be practically counteracted.

Bridges Nos. 5, 15, and 19 are of iron; bridges Nos. 5 and 15 rest upon stone abutments, designed in accordance with the other masonry of ornamental bridges.

No. 19 rests upon a foundation of masonry that is wholly underground. These iron bridges are all for walks—(the widths and other dimensions are shown in the tabular statement)—Nos. 15 and 19 being over the bridle road, and No. 5 over a narrow portion of the Lake. No. 15 is of cast-iron, and Nos. 5 and 19 chiefly of wrought iron; all with plank floors, well caulked, and very strongly made.

Bridge No. 10 is a wooden bridge, resting on stone abutments 56 feet apart, with four intermediate piers, placed two abreast. It carries a walk from the Ramble across an arm of the Lake. The principal timber in the bridge is white oak, with yellow pine floor; the panels of the railings are filled in with open cast-iron work.

Bridge No. 1 is exceptional to the other bridges, being connected with the ornamental masonry of the Water Terrace at the head of the Mall, and being, rather an incident or accessory, than the prominent feature of that work.



The bridge, so far as it serves to carry the carriage road and walk over the entrance from the Mall to the Lake, has a height of 16 feet, a span of 29 feet, and a breadth of roadway of 45 feet. The roadway is supported on wrought iron girders 24 inches in depth, ranged 6 feet 11 $\frac{1}{4}$ inches apart, and connected with brick arches. The girders rest upon a portion of the main sidewalls of the Terrace structure. This sketch represents a section of the iron girder.

The brick arches of the roadway, owing to the mode of construction, admit of but little descent for drainage from the middle to the ends of the bridge, and greater care than usual has been taken to render the work completely impervious to moisture. The brick-work was first plastered over smoothly with cement, a coat of asphalte was then applied, and next a canvass cover was put over the whole, and this again coated with asphalte. This process was extended over the ends of the arches and iron girders, and down the rear of the walls below the freezing point, and the canvass, being well coated on both sides, was then turned outward from the wall and lapped on the sloping edge of a broad puddled clay gutter; in the hollow of this gutter a line of drain tiles, with open joints, was laid, leading securely away from the rear walls; clay, puddled or well rammed, connected the gutter with the original unbroken earth in rear of the walls.

The drain tiles were covered with coarse gravel or rubble, and the earth filled in above to the height of the brick-work and iron girders of the bridge. Additional under-drains receive and carry off the surface water from the bridge and the grounds in the vicinity.

The general terrace structure, of which this bridge forms a part, can only be described adequately by the aid of plans in considerable detail.

About 6,457 cubic yards of masonry of all kinds is contained in the work, including the bridge, and the connected lateral walls extending around and enclosing the area on the north side between the main structure and the Lake. The foundations are on rock, except for a small portion of the lateral walls. The drainage of the whole site has been thorough, the water being conveyed and discharged through numerous under-drains into the Lake. Hydrants, connected with the supply-pipes of the Park, are placed at convenient points for watering the area and the adjoining grounds; and a four-inch branch water-pipe is laid to the centre of the circle, near the Lake, to supply the fountain and basin that are designed to occupy that position.

The masonry of all but the face-work, and the interior brick arches, is

composed of the gneiss stone of the Park. The face-work, trimmings, balustrades, &c., are of New Brunswick stone throughout. The steps and platforms of the stairways, and of the wall at the border of the Lake, are of granite. The main platforms of the stairways are formed of slabs of granite, the largest of which measure 10 feet 9 inches by 19 feet 7 inches, and weigh about 15 tons each.

The floor under the bridge and arcades is formed of a bed of clean broken stone, covered with a coat of gravel concrete, and surmounted by a pavement of hard, common brick, laid in mortar. The inequalities of the surface of the rock below the floor, that were liable to hold water, were filled with concrete before putting down the bed of stone, and advantage was taken of the principal depressions of the rock surface, to lay a series of under-drains through them, to gather any water proceeding from infiltration through the rock, and conduct it to the main under-drains of the foundation. The main under-drains are, in part, large enough to be entered and examined, and are also so arranged as to admit of being flushed out when necessary. Upon the brick pavement, which is left one and a half inches below the final level, it is intended to lay marble or encaustic tiles, to complete the floor.

The area covered by bridge and connected arcades is 5,050 square feet; and the open area north of the main work, containing the site of the fountain, and terminating at the Lake, contains 32,090 square feet. The whole area of ground occupied by and enclosed within the entire connected work, is 63,400 square feet, or $1\frac{1}{2}$ acres.

This work is mainly completed, as regards the bulk of materials and expenditure involved; but a considerable amount of masonry, and of other work of various kinds, remains to be done.

Bridge No. 12, east of the Water Terrace, and near the east end of the Lake, carrying a carriage road and walk over a walk, is a structure similar, in some respects, to the Terrace bridge. The roadway is supported by wrought-iron girders, of the same kind as in the Terrace bridge, connected with brick arches, and resting upon walls of rubble stone masonry. The walls are to be faced on the outer ends, or fronts of the bridge, with stone, and arches are to be formed in the facings over the footway, or space spanned by the bridge. The interior rectangular portion of the bridge, under the iron girders, is to be finished with a ceiling and facing of wood-work, joined to the arches of the fronts. A flight of stairs, connected with the west front of the bridge, ascends from the lower level to the height of the ground above.

The work is all completed, but the facings, balustrades, and the stairway. The roadway was brought into permanent use in November last.

Bridges Nos. 8 and 11 were built by contract, during the year 1860; bridge No. 9, also built by contract, was completed in 1860, with the exception of the setting of the balustrades. The superstructure (of wood) of bridge No. 10, was built by contract in 1860. Nos. 13 and 14 were also built, with the exception of balustrades, in 1860. No. 15, iron superstructure, and No. 16, were both mainly built by contract, in 1860; the foundations of No. 17 were laid during the same year. No. 19, iron superstructure, (by contract) was commenced during the same year.

All the ornamental bridges designed for carriage crossings, that were commenced or completed in 1860, except No. 17, were brought into use, permanently or temporarily, during that year.

The bridges that were incomplete in 1860, have all been completed during the past year, excepting Nos. 12, 14, and 16. Bridge No. 17 (excepting the foundations) has been mainly built and brought into use during the year, only the balustrades and a small portion of the wing walls remaining unfinished. This bridge has the largest span (45 feet) of any of the arched stone and brick bridges on the Park. Bridge No. 23 has been built and brought into use during the past year.

The foundations of bridges 24 and 25 have been, in part, prepared, but no work has been done upon the superstructures.

The plans of the remaining five bridges, have not been matured. The sites and adaptation, respectively of these bridges, are as follows:

Three bridges are for walks over the bridle road, around the new Croton reservoir; one bridge is for a walk over bridle road and carriage road, at the entrance to the Park from Fifth avenue, at Ninetieth street, and one bridge is for a carriage road and walk over the ravine and brook east of the Pool, (designated H, on the map,) and about at the intersection of One hundred and second street and Seventh avenue.

The four bridges for the walks are all intended to afford communications, over the bridle road, between the Park and a walk around the summit of the new reservoir.

3d. Rustic Bridges.

But four bridges of this class have been built as yet, viz., Nos. 18, 20, 21, and 22. Bridge No. 18 consists of only a stone arch, resting upon natural rock abutments, and is for a purpose similar to that of the ornamental bridges in general, as it carries a carriage road, with walks on each side, over the bridle road, instead of being adapted merely to a walk, as is the case with the other rustic bridges. The work being entirely rustic, it is therefore put in this class. It is built of rough gneiss stone of the Park.

The beds and joints of the stones are dressed and laid closely, but in all other respects the stones are left purposely rough with their natural faces, or such faces as were formed in blasting them out of the ordinary rock excavations. The natural roughness of the rock abutments and approaches and of the arch, taken together, gives the bridge the appearance somewhat of a rock tunnel, and this effect is further increased by the treatment of the outer ends of the arch, which are covered with earth and designed to be planted with shrubbery as in the case of the transverse road bridges. The arch has been well coated with asphalt, and the contiguous ground well underdrained. This bridge is situated near the entrance to the Park from the Eighth avenue, at Seventy-second street. It was built in 1860, and the carriage road over it was temporarily brought into use in 1861. The leading dimensions of this, and of the other rustic bridges, are given, for convenience, in the previous tabular statement of ornamental bridges.

Bridge No. 21 is a wooden bridge, of red cedar, over the Ramble brook at its entrance into the lake. No. 22 is also of wood (cedar, sassafras, and oak), over the narrow channel of the lake west of Bridge No. 4; and No. 20 is a rough stone bridge on the west side of the Ramble, carrying a narrow footway over a walk.

The wooden bridges are strongly built, of rough, durable timber in its natural state, resting on rustic stone abutments. The floor of one of these bridges, No. 21, is composed of a plastic material similar to cement, spread over and supported by an underflooring of plank, and the other, No. 22, has a floor of yellow pine plank caulked at the joints.

The stone bridge No. 20, is built in connection with the detached half-buried mass of rock, commonly designated by visitors "The Cave," from the large cleft running vertically through it, and a natural cavity contained within it. This rock is used, in part, as a natural bridge for the footway communicating with and crossing the rustic stone bridge.

The portion of this rock on the east side of the cleft, was found by careful measurements during the process of excavating around the mass, and developing its features, to be so nearly poised upon an angular point underneath, that it was considered necessary, for safety to the workmen, to prop the overhanging part on the side towards the lake with a strong stone pier.

When the work was completed, the new entrance on the opposite side from the lake tunneled out, the rock-work above and around it built, the interior cleared out, &c., the stone pier was removed. The rock has since remained firm in place, showing no signs of movement, and is not now considered liable to any change without a more than ordinary disturbing cause.

III.—GRADING AND SHAPING OF GROUNDS.

The grading and shaping of grounds embraces all, or nearly all, the operations in earth and rock excavations and fillings carried on in the construction of the Park.

A statement showing the rates of progress during each year, with some of the more characteristic details of the work, is all that can be attempted at this time.

The ordinary shaping of grounds, independently of other works and material pertaining to the general plan of construction, involves a comparatively small amount of labor or expense, the heaviest part of the work being that which is connected with the grading of roads, excavation of ponds, &c., and the removal and disposition of the large masses of materials which are incidental to, rather than being a necessary part of the grading and shaping of the grounds in general. In the latter respect, the usual mode of proceeding may be described as follows :

A road or walk is to be graded over very uneven ground, or a transverse road is to be cut through the grounds, or a pond is to be formed, &c. ; the first conditions being settled—*i. e.*, whether the plan or location of the work, in each particular case, can be so adjusted as to equalize the excavation and filling for the special work—the question arises, if surplus material is unavoidably obtained, “where shall it be disposed of to the best advantage in shaping adjacent grounds?” If there happens to be a deficiency of material for the special work, the question is then, “from what part of the adjacent grounds can it be supplied or ‘borrowed,’ and, at the same time, improve, or at least not detract from the original surface?” These questions being determined, the work of grading and shaping proceeds accordingly.

In the case of ordinary shaping of grounds where no exterior material is to be had within economical hauling distance from the area to be shaped, such material as is considered essential, is obtained within the area of ground operated upon, by excavating specially for the purpose (generally very lightly) in such places as will tend, by being depressed, to improve the surface.

The total quantities of materials excavated, removed, and deposited within the Park, in the respective modes of operating, including necessarily, material made use of in various ways for other purposes, or not directly pertaining to the grading and shaping of grounds, are as follows :

Date.	Rock. Cubic Yards.	Earth. Cubic Yards.	Muck or Top-soil and Compost. Cubic Yards.
1858 }	198,000	1,002,100	142,700
1859 }			
1860	45,400	221,820	60,740
1861	37,180	371,880	40,830
Totals.....	280,580	1,595,800	244,270

The quantities of materials that have been obtained from outside the Park by contracts for the same general purposes, are:

	Stone Filling. Cubic Yards.	Earth Filling. Cubic Yards.	Muck or Top-soil. Cubic Yards.
1858 } .....	.....	126,400	.....
1859 }			
1860 .....	.....	64,950	835
1861	5,390	34,840	18,545
Totals.....	5,390	226,190	19,380

The aggregate of excavation and filling obtained within and from without the Park up to December 31st, 1861, is 2,371,610 cubic yards. The principal quantities of excavation and filling have been obtained from, and made use of in, the following localities on the Park, following the order of time in which the work has been done, as nearly as practicable in the description:

Cub. Yards.

- 100,000 Excavation, mostly rock, grading the Mall and ground immediately adjoining east and west, also excavating for Terrace work and side slopes; the material used chiefly in deep filling for carriage road south-east of Mall, and filling other places surrounding the Mall.
- 195,000 Excavation mostly of earth, from the site of the Lake—used in filling for road and border of Lake, S. W. side of Lake, and for other work around the Lake.
- 58,000 Excavation, earth and rock, for pond near Fifty-ninth street; used in filling for main entrance at Fifty-ninth street and Fifth avenue, and for grading carriage roads south of Sixty-fifth street.
- 85,000 Excavation, mostly earth, grading open ground designated C & D, on map; materials used mainly in filling for west drive and contiguous ground.
- 60,000 Excavation, mostly rock, for Transverse Road No. 1; used chiefly in bridge, and retaining wall masonry, grading, and substructure of roads.
- 63,000 Excavation, mostly rock, from Transverse Road No. 2; used mainly in bridge, and retaining wall masonry, grading, and substructure of roads and walks.
- 450,000 Of earth, blasted rock, and swamp muck, removed from the site of the new Croton reservoir, and deposited on the Park grounds adjacent. This quantity is not included in the preceding statements.
- 5,800 Excavation, partly earth, boulders, and soft rock, in ravine from site of Pool H, extending eastwardly; the materials used in filling and shaping open ground F. G.

Filling by Contracts.

- 77,000 Filling, earth and blasted rock, north side of Fifty-ninth street, between Sixth and Fifth avenues, the rock obtained in part from excavation along Fifty-ninth street, north side, between Sixth and Eighth avenues, the largest portion of the earth filling obtained from sources exterior to Park.
- 120,000 Filling, from sources exterior to Park, used mainly in grading roads and side slopes near Fifth and Eighth avenues, south of Sixty-third street.
- 19,400 Filling obtained from sources exterior to the Park, and used mainly in filling for roads between Seventieth and Seventy-third streets, near Eighth avenue.

The work of grading and shaping the ground has not extended as yet above One hundred and fourth street. It is substantially completed on that portion of the Park lying south of Seventy-ninth street, or the old reservoir, and is very far advanced toward completion on the portion extending north from Seventy-ninth street to about One hundred and second street.

The quantity of filling of all kinds, required to complete the shaping of ground south of Seventy-ninth street (exclusive of work connected with the Park fence, and the unfinished grading of the Fifth and Eighth avenues) is about 46,000 cubic yards, and the extent of ground embraced is about $37\frac{1}{2}$ acres.

The extensive work of the new Croton reservoir has delayed operations in the district of the Park surrounding it. This work is now nearly completed, and it will be practicable, during another season, to complete the grading and shaping of that district, extending north as far at least as One hundred and third street, as well as to close up all the work south of the district.

During the year 1860, the work of this kind was chiefly carried on with reference to completing the grounds south of Eighty-fifth street, and about thirty acres of ground north of the new reservoir, designated on the map F & G.

Strips of ground bordering on the avenues and Fifty-ninth street were necessarily omitted in that year's operations, in consequence of the unfinished state of the grading of the avenues and Fifty-ninth street, and no work was done in the district of the Park lying along the Fifth avenue, between Seventy-second and Eighty-sixth streets. The work in these two districts has been mainly closed up during the last year, but where the grading of the avenues is still incomplete, more or less contiguous shaping and filling remains to be done. During the last year the following areas, have also been wholly or chiefly completed as to grading and shaping, viz.: the concourse (N) and surrounding ground east of the Mall; the area between transverse roads Nos. 2 and 3, and west of the old reservoir; the area north of transverse road No. 3, west of the new reservoir, and extending to about Ninetieth street, and $30\frac{1}{2}$ acres of the area north of Ninety-seventh street, extending to about one hundred and fourth street.

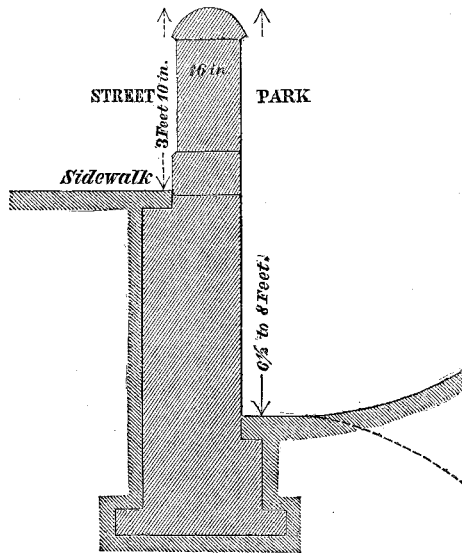
The whole quantity of materials—excavation and filling, exclusive of compost and manures—removed and deposited in grading and shaping during the past year, is 500,670 cubic yards, and the extent of ground embraced is about 117 acres.

It is very desirable that the grading of the avenues should be completed without delay; the deep fillings require time to settle and become firm,

and much of the border work of the Park must be delayed until this takes place. Suitable foundations for the Park fence cannot be laid on the avenue filling, in many places, under four or five years from the time it is deposited; and, in order to enclose the Park permanently within a shorter period than this, it will be necessary to take more than the ordinary precautions to consolidate some of the fillings that remain to be made.

In connection with this subject, reference is made to the samples of Park fence that have been constructed on Fifty-ninth street, near Sixth avenue.

The first sample is east of the Sixth avenue entrance, and is constructed of the usual gneiss stone of the Park or immediate vicinity, roughly dressed on the faces, and finished with a coping on the top of Maine granite. The stones are sufficiently dressed on the beds and ends to make close mortar joints, and are laid compactly in hydraulic mortar. The foundation is placed at a secure depth below frost, and the whole forms strong and durable work. The design is shown by the following sketch.



The height of the wall above the sidewalk to the top of the coping is 3 feet 10 inches, the thickness of this part of the wall is 16 inches. One portion of the sample is intended to show a height on the Park side of 8 feet, and the other portion a height of 6½ feet, for the purpose of exhibiting its relative advantages as a fence of the two different heights.

The ground line, curving upward on the Park side, indicates the in-

tended shape of the ground where it rises in rear of the wall, and the dotted line, curving downward, indicates the shape where it descends.

The second sample is west of the Sixth avenue entrance, and is of the same form as the first, but is constructed of Hudson river "blue stone," instead of gneiss. This sample has not been fully completed.

Several modifications of the form of the samples are contemplated—should this kind of fence be adopted—at different places around the Park, to adapt it to local circumstances of the ground. The modified forms would retain the general similarity and advantages as a barrier, but in all cases would be constructed at less expense than the form of the samples.

Whatever form or kind of Park fence is approved—whether of stone or iron—a considerable amount of work will be required to prepare the foundations and shape the Park grounds immediately adjoining.

IV.—DRAINING OF GROUNDS, *embracing Superficial and Sub-drainage.*

1st. Superficial Drainage.—This term applies to the work of draining the surface of the ground, roads, walks, &c., of such falling water, from rain or snow, or permanently running water, as cannot be disposed of by means of ordinary agricultural or sub-drainage. The work embraces a system of surface and under-drains combined—gutters, drains, and water channels, on the surface, connected with drain pipes and sewers below. The main underground drains and sewers, are those that are used in common with the agricultural drainage system.

There are five principal drainage areas of the Park that receive and collect surface water, and discharge it from the Park, by as many different outlets.

These areas are numbered from one to five, beginning at the south end of the Park, and are described in the following tabular statement:

No. of the Drainage Area.	No. of Acres contained.	Place of discharge from the Park.	General Boundary—or Outline of Drainage Area.
1	$158\frac{1}{10}$	59th st., between 5th and 6th avs.....	5th av. from 71st st. to 59th st., 59th st. to 8th av., and 8th av. to 69th st. The boundary line across the Park connecting the points on 8th av., 69th st., and on 5th av., 71st st., curves southerly to a little below the range of 68th st.
2	$249\frac{3}{10}$	74th st., 5th av.....	Bounded south by the line last described, and north by an irregular line crossing the Park from 8th av. at 55th st. to old reservoir; around northwest corner of old reservoir to new reservoir, and around south and east sides of new reservoir to 5th av., at 90th st.
3	$24\frac{3}{10}$	87th st., 8th av.....	South by a part of the last line, west by 8th av., north by a line from about 92d st., 8th av., to the new reservoir, and east and southeast by the reservoir.
4	$42\frac{5}{10}$	99th st., 5th av.....	East by 5th av., north by a line from 5th av., 101st st., extending west 500 feet to open ground G; thence the boundary line extends irregularly southwest to the new reservoir east of gate-house; thence along the reservoir to 95th st., 5th av.
5	$227\frac{2}{10}$	5th av., at 108th st.	East by areas Nos. 3 and 4 and new reservoir, and north by 110th street.
	$701\frac{4}{10}$		

The drainage water of the first area is collected in the pond near Fifty-ninth street before being discharged from the Park.

The drainage water of the second area is, in like manner, collected in the lake, with the exception of a portion of the water drained from the ground east of the lake and the old reservoir.

The drainage water from the fifth area, is mostly collected in the pool and in the brook extending (at present in its natural unimproved condition) from the pool toward the northeast corner of the Park, where it enters a city sewer and passes off to the East River.

In addition to the drainage water furnished by the several drainage areas mentioned, the drainage from three considerable districts of ground outside, west of the Eighth avenue, enters the Park at present, and must continue to do so until the proper city sewers are constructed to divert it. The first of these districts is that lying west of the Eighth avenue, between Fifty-ninth and Seventy-second streets—the water from this enters drainage area No. 1 at the Eighth avenue, near Sixty-second street, and also near Sixty-fifth street.

The second district embraces a part of Manhattan square, and extends in extreme length from about Seventy-third street to Ninety-first street. This district receives as a part of its drainage the water drained from area No. 3, and discharges the whole into area No. 2 at the Eighth avenue, Seventy-fifth street.

DEPOSITING CHAMBERS AND FILTER.

IV.

WEST SIDE OF LAKE.

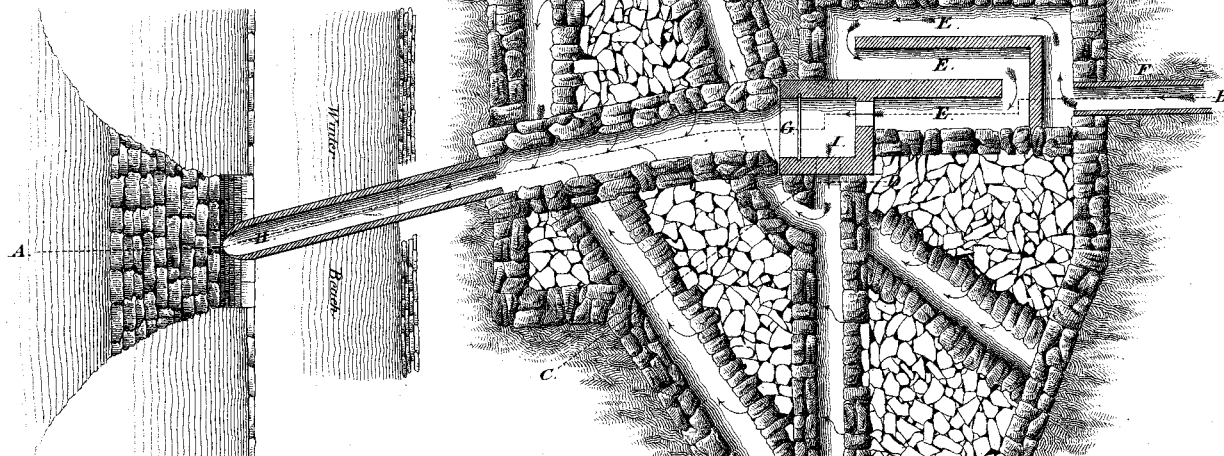
SCALE $\frac{1}{120}$

E. Depositing chambers.

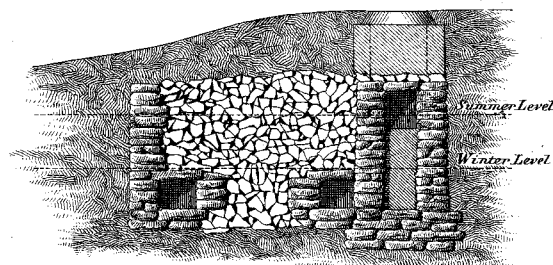
F.F. Sewer inlet.

At G. Provision is made for the escape of the water into the outlet H.H. in case more water enters than will pass through the filtering materials.

Horizontal Section under the covering of chambers and channels.

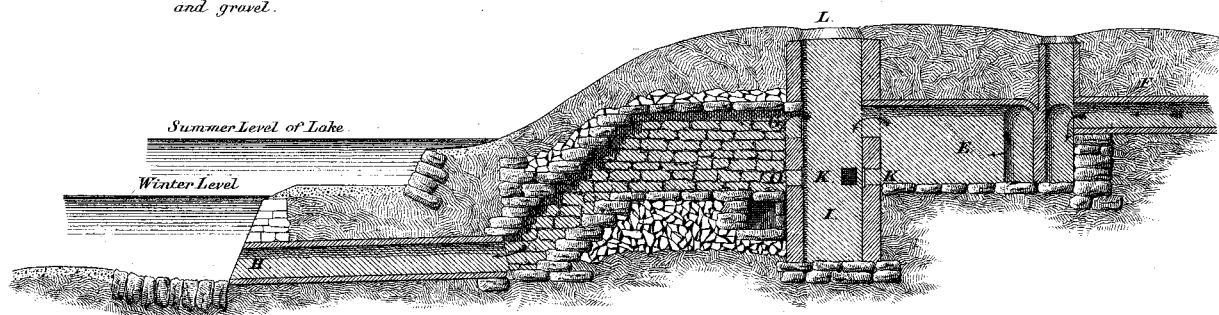


Section on C. D.



The filtering materials are rubble stone and gravel.

Section on line A. B.



At K.K. are gates which are to be opened in cleaning out the chambers to admit the deposits to enter the well I. under the Manhole L.

The gate O is also to be opened in cleaning out the well I.

Note. The shape and general arrangement of this work was governed by local circumstances.

The third district extends from Ninety-second to near One hundred and fifth street, the drainage water of which enters drainage area No. 5 at One hundred and first street. The total area of the districts outside, that now drain into the Park, is estimated at 313 acres. This exterior drainage, though temporary, has to be provided for to some extent, in the arrangement of the main drains and sewers of the Park.

The drainage of area No. 1 is received from the several road drains, sod-gutters, and lateral under-drains, generally into two main brick sewers with lateral branches, which discharge into the pond near Fifty-ninth street. One of these sewers passes from the Eighth avenue, between Sixty-fourth and Sixty-fifth streets—receiving at that point (and at Sixty-second street by means of a branch sewer) the drainage from the district mentioned west of the avenue, through the open ground, designated C on the map, to the west end of the pond, near the bridge road, and the other sewer extends from the low ground east of the mall to the pond, and enters it at a point about midway between the west end of the pond and its southeast extremity near Fifty-ninth street.

The drainage of area No. 2 is received in like manner from a series of road and walk drains, and sod gutters, with larger sized drains, water channels and brick sewers of various sizes, which extend various distances and discharge into the lake at seven principal points around its border.

Four of the largest sewers enter the lake through filters, and depositing chambers, constructed to intercept silt and impurities washed from the roads. The two main sewers of area No. 1, also enter the pond through depositing chambers.

The drainage of area No. 3—this being a comparatively small area—is accomplished by one main under-drain of 470 feet in length, with a branch of 570 feet in length, together with the connected smaller drains and gutters. The main drain extends at present (being unfinished) from transverse road No. 3, at bridge H, the west bridge of that road, in a north-west direction, to the Eighth avenue, and discharges between Eighty-eighth and Eighty-ninth streets.* The water passes under and across the avenue by an imperfect temporary drain to the low district of ground on the west, and being added to the drainage of that district, which extends south to near Seventy-third street, re-enters the Park as before stated, passing under the Eighth avenue at Seventy-fifth street, by a temporary drain into area No. 2. Area No. 4 is also a small area, and will be drained when the works around and within it are completed, by a small under-drain discharging at the Fifth avenue at Ninety-ninth street.

* The permanent connection of this drain with the Eighth avenue sewer (when built) will be at Eighty-seventh street.

Area No. 5, the largest of the drainage areas, has at present 410 feet of sewers, besides a large sewer constructed by the Croton Aqueduct Department, which is in part available for surface drainage. This sewer extends from the north gate-house of the new reservoir through the Park grounds, in a direction nearly north, 1,950 feet to the low ground in which the pool designated H on the map is situated. It is intended to convey surplus water from the reservoir, or to be used for drawing down the reservoir whenever that may become necessary.

Additional sewers and water channels remain to be constructed, together with the greater part of the details, minor drains, gutters, &c., of the system applicable to this drainage area. This system of drainage is too extended to admit of a clear description, without reference to a drainage map.

The drainage water of this area is chiefly concentrated in the Pool (H) or in the brook leading through the ravine from the pool to the northeast corner of the Park. The quantity of water supplied by so large an area, renders it necessary to extend the scale of the drainage work in corresponding proportion. The design as to the extreme northern portion of the system, has not been entirely perfected.

The larger drainage areas, have, besides the principal basins and depressions into which the water descends—other subordinate depressions and irregularities of surface of various extent, through which the drainage water must pass, and which would form pools, in many cases during rains, if proper arrangements were not made for discharging the water. There are also districts of ground in which the natural water courses have been unavoidably obstructed by the works of the Park, forming artificial basins, which would be liable to become ponds at times of excessive drainage, if ample outlets were not provided.

Special attention has been given to all such cases, to prevent the lodgment of water. Underdrains of ample capacity have been laid, and the water admitted to them by inlets with grated covers, or, where practicable, natural depressions have been modified more or less, in extent and in depth, and the ground so shaped as to give them outlets on the surface. In some instances, to guard against contingencies, double inlets are made, one communicating with a separate drain from the other, or communicating with the same drain or sewer, at a different point, where the capacity is enlarged, &c. Experience has shown that it is not safe to rely upon agricultural drains, however perfect they may be, to absorb and carry off sudden accumulations of water from any considerable area of depressed ground. Such drains act by a slow process of percolation under the most favorable circumstances, and are liable to become entirely inoperative for surface drainage at times when they are much needed; as, for instance,

when the ground is temporarily and lightly frozen, or when it has been frozen to the greatest depth, and is gradually thawing out, the lowest portion of the frozen stratum remaining unaffected and impervious, for a considerable length of time, &c. At such times, standing water on the surface for a longer or a shorter period, must result from a thaw of snow, or rain, and if no other damage ensues, lawn-grass and shrubbery that might be submerged, would be likely to receive serious injury.

The surface and underdrains for irregularities and depressions of ground connect with the general system of paved and sod-gutters, water channels, and sewers. Where drainage water is brought to the roads, from adjacent higher grounds, it is generally intercepted by parallel catch-water drains, or sod-gutters, in the manner that has been described under the head of "Walks."

The drainage of the road surfaces is received through strongly grated inlets in the gutters, into underdrains below, which underdrains run mostly parallel and continuous with the roads. The wider roads have underdrains for each gutter, the narrower roads have but one underdrain. The inlets are placed from 200 to 550 feet apart along the gutters (generally 200 to 300 feet apart), and are in all cases constructed with silt basins at the bottom to catch any substances that would otherwise be carried into the drains. Branch pipes are inserted in the top of the silt basins to connect them with the road drains, and the basins are constructed so as to be easily cleaned out, by the removal of the grating over the surface aperture. The road drains and the adjoining sod-gutters, discharge at various convenient points into larger underdrains or sewers, and thence the water is conducted to the ponds or to the drainage outlets of the Park.

The manner of constructing the paved and sod-gutters, has been described under the heads of "Roads" and "Walks." The underdrains are constructed of glazed vitrified earthen pipes, of cement pipes, and of brick, the vitrified and cement pipes being employed for the smaller class of drains, and the brick, for the larger or main drains. The "cement pipe" is a recently manufactured pipe, and has not been made use of on the Park previously to the last year. It is composed of hydraulic cement and sand formed in a mould which gives the pipe a true outline, and smooth surface within, and the joints are adapted to making close connections with facility. The strength of the pipe is given by the natural indurating property of the cement. It is somewhat cheaper than the vitrified pipe, and no doubt is entertained as to its durability for the purpose, and in the positions in which it has been used.

The brick sewers are built of hard well-burnt brick, laid closely in hydraulic mortar, upon a firm foundation: the form is in part circular, and

in part oval. The size is generally such as to admit of their being entered and cleaned, or repaired, when necessary.

The descent of all drains is sufficient to keep them free from sediment, by the ordinary action of the water passing through them; or is such as to admit of their being flushed out; they are also laid at a secure depth below frost.

The following tabular description embraces the principal details of all the underdrains of the several kinds that have been completed for all purposes except such as belong exclusively to the agricultural drainage system, which latter drains will be described in connection with that branch of the subject.

Kind of Drain.	Dimensions of each kind. <i>C</i> , circular; <i>O</i> , oval				Size 12 to 18 inches. Length, Feet.	Total length of each kind. Feet.	Lengths Constructed in each year.			
	Size.	Length Feet.	Size.	Length. Feet.			1858.	1859.	1860.	1861.
Brick Sewers.	<i>C</i> , 2' 3"	1,030'	<i>O</i> , 2' x 2' 3"	1,000	12,692'	19,192	2,800	8,537	6,163	1,692
	3'	665'	2' 3" x 3'	1,800						
	2' 6"	440'	3' 3" x 4'	1,085						
	2' 3"	60'								
	2'	420'								
	Total..	2,615'	Total.....	3,885'						
Vitrified Pipes.	.....	.....	4, 6, 8 & 10"	48,431'	.....	48,431	.....	15,100	18,253	15,078
Cement Pipes.	2'	344' 5"	4, 5, 6, 7, 8 & 10"	8,804' 6"	23,374	11,142	.....	.....	.....	11,142
Tiles	2" to 4"	.....	0' 19 x 24"	363' 5"	.....	23,725	.....	23,130	595	.....
	Aggregate length.....	.....			.....	102,490	2,800	46,767	25,011	27,912

The table includes a brick drain of 18 inches interior diameter, and 2,100 feet long, constructed to convey surplus and leakage water from the outlet sewer of the old Croton reservoir to the lake. It connects with the Croton sewer near the Fifth avenue at Eightieth street, and enters the lake by a small cascade on the opposite side from the water terrace. This drain will also receive, to the extent of its capacity, such leakage and waste water as may proceed hereafter from the south gate-house of the new reservoir—as the outlet sewer, from the south gate-house, extends to and connects with the sewer from the old reservoir, at the point where the latter communicates with the drain.

Water arising from springs and infiltrations from the old reservoir, which has been developed in excavating for transverse road No. 2, has also been gathered and conveyed by a drain into the ramble brook and

thence into the lake. These acquisitions, that will doubtless increase rather than diminish hereafter, add a valuable supply of pure water to the lake. The outlet sewer from the north gate-house of the new reservoir, it is probable, will contribute an equal amount to the pool and the brook proceeding from it.

The sewers pertaining to the Croton reservoirs, and passing through the Park grounds, are as follows :

The sewer extending from the east side of the old reservoir, in the line of Eightieth street to the Fifth avenue, the interior diameter of which is 3 feet, and the length within the Park 1,000 feet. The sewer extending from the south gate-house of the new reservoir to Eightieth street, near the Fifth avenue, where it connects with the last-mentioned sewer, the diameter being 3 feet, and the length 1,650 feet; and

The sewer extending from the north gate-house of the new reservoir, near the pool (H), the diameter being 5 feet, and the length 1,950 feet.

Also, a 12-inch drain extending from a blow-off chamber of the Croton mains at Eightieth street, near the Fifth avenue, to a point where it enters a Park sewer, north of Bridge No. 8, a distance of 580 feet; and a similar drain from the main in transverse road No. 2, near the east end of bridge E, to the arm of the lake south of that point, a distance of 200 feet; and a similar drain from the Croton conduit, near its entrance, to the old reservoir, at Eighty-fifth street, to a connection with a Park sewer east of bridge No. 17, a distance of 795 feet. Also, a 12-inch blow-off drain, extending from the Croton main that passes through transverse road No. 2, to the transverse road drain west of Bridge G, a distance of 160 feet.

The total length of all these sewers and drains of the Croton Aqueduct Department is 6,335 feet, or $1\frac{2}{5}$ miles.

The drainage water from Areas Nos. 1 and 2 has proved quite ample for the supply of the pond and the lake respectively, except for a short period during the summer of 1860, when the surface of the lake was depressed a few inches. A very moderate draft upon the Croton water would have remedied this, had it been considered important. It will be borne in mind, that the original estimates provided for such a contingency as regards the lake. [2d Annual Report, for 1859.]

Experience, thus far, indicates that no difficulty will occur as to the purity of the water in the pond and the lake. The exterior drainage into the Park is at present the only source from which impurities proceed that are not entirely or practically corrected by the filters that have been constructed.

The series of silt-basins interspersed over the drainage-areas, together

with the depositing chambers and filters at the borders of the ponds, operate in a satisfactory manner to purify the Park drainage. The water, though it cannot be kept quite as pure as may be desirable, while exterior drainage enters, has hitherto remained clear and wholesome, with slight exceptions of temporary discoloration after the heaviest summer showers.

2d.—Agricultural Drainage.

The general description and details of this work during the first two years' operations, 1858, 1859, have been given in the published reports. Mr. Geo. E. Waring, Jr., under whose immediate charge the work was done, up to and including the month of May of the last year, accepted, at that date, an appointment in the U. S. Army, and the duty of carrying on the drainage devolved upon the engineer department.

The plan and leading characteristics of the work, and its various processes, having been clearly set forth by the reports mentioned, it only remains, at this time, to note the subsequent progress that has been made, with a summary of the work during the different years of construction—as in the case of the other works of the Park that have been described; this will be done, as far as practicable, in condensed tabular form, as follows:

	1858.	1859.	1860.	1861.*	Totals of each kind and size.
	Feet.	Feet.	Feet.	Feet.	Feet.
Length of tile drains of 5 and 6 inch bore....	8,695	2,217	1,478	....	7,390
“ “ “ 3 and 4 inch bore....	6,823	4,097	2,932	255	14,112
“ “ “ 1½ and 2½ inch bore....	93,377	40,419	30,258	19,993	184,047
Length of vitrified pipe of 8 and 10 inch bore....	....	2,808	....	....	2,808
“ “ “ 3 to 6 inch bore....	1,100	1,621	650	300	3,671
Length of stone drains.....	....	500	557	1,300	2,357
Length of stone and tile drains.....	....	2,776	3,000	4,872	10,648
Totals of all kinds and sizes.....	105,000	54,498	38,875	26,720	225,033
No. of brick silt basins underground.....	60	40	12	....	112
“ “ “ open, with lids.....	13	6	3	1	23
Acres drained.....	140	100	75	45	360
Length of drains with descent of less than 6 inches to 100 feet.....					34,312 feet.
“ “ with over 6 and less than 12 “ to 100 feet.....					35,330 “
“ “ under 3 inch bore, laid without collars.....					73,030 “

The brick sewers that are appropriately used in common by the two systems of superficial and sub-drainage, having been noted under the head of “Superficial Drainage,” are here omitted.

* Most of the drains laid during 1861 were connected directly with road basins, sewers, or other drainage systems; hence the small amount of large mains laid during this year.

During the past year, 25,120 lineal feet of all sizes of tiles have been laid; a length of 24,865 feet of this has been of sizes from $1\frac{1}{2}$ to $2\frac{1}{4}$ inches bore, all of which has been laid with closely fitting collars at the joints. The minimum descent per 100 feet has been 12 inches; all but 2,000 feet has had a descent of 18 to 24 inches per 100 feet. The average distance apart of the drains has been about 33 feet.

About 560 feet of drains formerly laid, have been found during the last year obstructed with willow roots which had grown into the joints, and have been taken up and relaid. One line of mains in the district south of the old reservoir, of about 260 feet in length, has been taken up and a larger pipe laid, in consequence of the first proving of insufficient capacity.

As far as opportunity has been had to examine the system, since the change in its superintendence occurred, it is believed to be operating with general success. The portions that were first laid with the least descent, and also without the use of collars, have shown a tendency at a few points, in the case of the small lateral drains, to accumulate silt, but no material break in the system or derangement of its operation from these causes has been detected.

In the balance of the work remaining to be done, there will be no occasion for laying the drains with less inclination in any case than one to two feet in 100 feet of length, and collars will be used to protect the joints of all tiles under $3\frac{1}{2}$ -inch bore.

The larger tiles or mains for which it is not practicable to use collars, will be cemented at the joints, wherever the precaution is necessary, as has been done during the past year. The mains secured in this way, as they carry more water than laterals, are not liable to obstructions. Should an obstruction occur in them, however, it is more serious than in a lateral; hence provision is made for inspecting the condition of the mains with facility at proper points, as the silt-basins, outfalls, &c.

V.—WATER PIPE SYSTEM, *for Irrigation, &c.**Dates and Quantities of Work Done.*

	1859.	1860.	1861.
	Feet.	Feet.	Feet.
Length of 16-inch pipe laid.....			113
" 12 " " ".....		100	
" 10 " " ".....	5,010	2,078	3,906
" 8 " " ".....	4,738	1,718	3,638
" 6 " " ".....	6,947	8,420	3,165
" 4 " " ".....	5,009	18,207	6,771
" 2 " " ".....			63
" 1 " " ".....		738	625
No. of hydrants set.....	46	188	232
" stop-cocks set.....	21	26	17

TOTALS.

Length of pipes of all sizes.....	13½ miles.
No. of hydrants.....	466
" stopcocks.....	64

The water-pipe system of the Park is designed upon a plan of conducting water generally over the entire area, so that all parts of the grounds may be conveniently irrigated, and the roads and walks sprinkled, in the most convenient manner.

Hydrants are placed along the borders of all roads, at distances of 90 to 120 feet apart, and generally on the lawns, (south of Eighty-sixth street as yet,) at distances of 300 to 500 feet apart.

The supply of water to the system is obtained from the Croton—at present by means of a syphon over the wall of the old reservoir, and permanently, as designed when the new reservoir is brought into use—by means of branches from the large Croton mains, at four different points, where these mains, in passing through the grounds, cross the line of the Park mains, or approach conveniently near to them.

The water-pipes are formed of sheets of wrought iron, in sections of from 6 to 8 feet in length, in cylindrical form, lapped and riveted at the joining of the edges, and coated internally with a mortar of hydraulic

cement and fine sand—these processes being performed by machinery. The internal coating is pressed firmly and smoothly while the material is fresh, and the bore is made true and even. The sections of pipe are bedded in a layer of fresh hydraulic mortar, placed at the bottom of the trench, and are then covered over with mortar, so as to form a thick exterior coating of that material. Collars or sleeves—which are short sections of pipe of considerably larger calibre—are slipped over the joints, and the annular space between collar and pipe is pressed full of mortar, and the collar coated over on the exterior, in the same manner as the pipe.

The strength of the pipe to resist pressure, consists in the wrought iron cylinder, the durability and impermeability, in the cement coating, and in the completeness with which it is applied internally and externally.

The following test has been made of the completeness of the Park system as regards leakage, consisting now, as shown by the foregoing statement, of thirteen and one-half miles of pipe. The supply was shut off at the syphon, and the depression of the water noted in the stand-pipe connected with the syphon—the hydrants and faucets of the distributing pipes being all closed during the trial. The depression of the water in the stand-pipe (which, for the time being, acted as a reservoir to the whole system) during one hour, was only one-fourth of an inch. The sectional area of the pipe being 144 square inches, the actual loss or waste, from leakage and all causes, was for the time at the rate of only $3\frac{3}{4}$ gallons per 24 hours.

Some parts of the system were not in communication with the supply at the time, but the test was not materially affected, it is believed, in consequence.

But few leaks have occurred as the pipes have from time to time been brought into use—not as many as would be expected in a similar length of cast-iron pipes. When a leak occurs it is readily detected, and the pipes admit of repairs with facility.

The advantages the wrought-iron and cement pipes possess over cast-iron are, comparative cheapness, freedom from incrustation, and the purity of the water delivered.

The trenches for the pipe are excavated such a depth as to give a covering of full four feet over the pipe.

The work of furnishing and laying the pipe, and setting hydrants and stop-cocks, is done by contract with the Patent Water and Gas-Pipe Company of Jersey City.

The portion of the system south of Eighty-sixth street, was mainly completed in 1860; the balance of the work in that district of the Park has

been performed during the last year, except a few minor details which remain to be added.

The pipes laid north of Eighty-sixth street are limited as yet to the line of the carriage roads, and have not been extended to the lawns, being adapted only to the watering of carriage roads, and the portions of the bridle road running parallel with them and the bordering grounds. This portion, extending as far north as One hundred and fourth street, has not been completed, nor any part of it brought into use, owing to the breaks that occur in the line at the crossings of unfinished bridges. Stop-cocks are placed throughout the system, at convenient places for shutting off the water in small districts, for the purpose of repairs, without checking the supply to other districts. Four permanent connections are designed and in part made, with the Croton mains which are laid through the Park grounds from the new reservoir. Any one of these connections will supply the whole system temporarily, in case of necessity, arising from accident to any section of the Park pipes or the Croton mains.

The hydrants for watering roads and lawns are set entirely below ground, the tops only showing at the surface. They are designed in such manner as to admit of being detached with facility, and lifted out of their exterior cast-iron cases for repairs. Self-acting waste valves are attached, that exhaust them of water, when not in use, to ensure safety from frost.

Blow-off cocks are attached to the pipes in the principal depressions or hollows of ground through which they pass, for the purpose of discharging sediment, whenever it may become necessary. Branches with stop-cocks attached, have been inserted in the main pipes, for conducting water to the sites of intended fountains. A line of pipe, in part laid, is designed to conduct the water discharged from the concealed waste weir at the east end of the lake to the ornamental basin (O on the map) between the lake and the Fifth avenue. Separate pipes will also be laid (in connection with the mains) to supply the fountains in the ornamental basin, and the conservatory adjoining the basin.

The smaller pipes, under four-inch bore, noted in the tabular statement, are employed as laterals to convey water to drinking fountains, the cottages in the Ramble, drinking places for horses, &c.

The large mains laid within the Park by the Croton Aqueduct Department are as follows :

Four mains extend from the east side of the old reservoir in the range of Eightieth street to the Fifth avenue, a distance of 1,000 feet; and one main from the west side of the reservoir in the range of Eighty-first street to the Eighth avenue, a distance of 885 feet.

One main from the south gate-house of the new reservoir, through the

grounds east of the old reservoir to Transverse Road No. 2, at a point between bridges F and G, a distance of 1,930 feet, and through that road to the Eighth avenue, an additional distance of 2,060 feet; and five mains from the south gate-house to the Fifth avenue at Eightieth street, a distance of 1,680 feet. Two mains from the north gate-house of the new reservoir, running obliquely through the park grounds, one to the Fifth avenue at One hundredth street, a distance of 2,443 feet, and the other to the Eighth avenue, at a point between Ninety-ninth and One hundredth streets, a distance of 2,034 feet. Besides these two mains, two incomplete mains are laid alongside, extending from the gate-house into the Park, each a distance of 220 feet.

The main brick conduit being the original terminus of the Croton Aqueduct, supplying the old reservoir, enters the Park at the Eighth avenue, and extends along the range of Eighty-fifth street to the Reservoir, a distance of 900 feet. The conduit or new branch from the Croton Aqueduct, supplying the new reservoir, enters at Ninety-second street, and extends in the range of that street to the reservoir grounds, a distance of 500 feet.

The total length of these works of the Croton Aqueduct Department, within and underlying the Park grounds, is 23,592 feet, or about $4\frac{1}{2}$ miles.

A portion of the plan of water distribution north of One hundred and fourth street, remains to be perfected in consequence of some details of the general design in this district not having been settled.

The high ground in this latter district on the Eighth avenue side, lying above the level of the Croton reservoir, together with a few other points similarly situated in other districts, will require a small supply of water, independently of the Croton. The areas of these districts above an elevation, ten feet less than that of the regular waterline of the Reservoir, are as follows, viz:

1st. The area above mentioned, lying chiefly between the Eighth and Seventh avenues, and One hundred and third and One hundred and seventh streets, containing 18 acres.

2d. An area lying around the north gate-house of the new reservoir, containing 3 acres.

3d. An area lying between the Eighth avenue and the reservoir, and between Ninetieth and Ninety-fourth streets, containing $10\frac{3}{4}$ acres.

4th. An area lying on the east side of the new reservoir, along the Fifth avenue, containing $5\frac{3}{4}$ acres.

5th. An irregular area lying partly between the old and new reservoirs, and extending south, between the old reservoir and the Eighth avenue, about as far as Eighty-second street, containing $26\frac{1}{4}$ acres. The highest ground in the Park, designated "Summit Rock," is in this area.

6th. An area on the east side of the old reservoir, containing $5\frac{1}{2}$ acres, and—

7th. An area surrounding the high rock through which the tunnel of Transverse Road No. 2 is carried, containing $3\frac{1}{2}$ acres. A small point at the southeast corner of the old reservoir, and one about 300 feet farther south, is also a little above the elevation before stated.

It will thus be seen that about $72\frac{3}{4}$ acres of ground are practically above the reach of the Croton water, by direct pressure or head, from the reservoirs.

For the purposes of irrigation merely, water may be drawn from the water-pipe system (when the reservoirs are full), and applied, by means of hose, to some of the less elevated parts of these areas, and water may be drawn contiguous to the areas to fill water carts, for sprinkling the roads and walks that lie within them. None of the areas are so situated, with regard to existing or contemplated improvements, as to demand, at present, any special provision beyond that of water-carts, as they have hitherto been used, for supplying them with water. The smaller areas, it is probable, can be best and most economically watered, permanently, by water-carts. For the larger ones, and especially the 1st, 3d, and 4th areas described, it may be found desirable to resort to other means. An ample supply to the 1st area for irrigation, roads, &c., can be had, it is believed, by elevating the water from the outfall of the Pool (H on the map), or from the brook in the ravine below, by a hydraulic ram, to a suitable reservoir on the summit of the hill. Should a larger supply become necessary than this would afford, resort must be had to a steam-engine to elevate the water. The same, or a separate engine must be used (the areas being widely detached) to supply the third and fourth areas, if more efficient means are desired, with respect to them, than the employment of water-carts.

The water raised by steam-engines would be drawn from the Croton, or from the pool and lake, respectively, as circumstances might require. Upon this subject, and also as to the general supply of water for the Park, reference is made to the data and suggestions of former reports. The

total quantity of water required per annum for the Park, for all purposes, has been estimated, approximately, at 200,000,000 gallons. At the rate the Croton water is used in the city, the area of the Park, if built upon and occupied in the same manner as other parts of the city, would consume over 1,000,000,000 gallons annually.

The estimated supply of 200,000,000 gallons annually, is believed to be sufficient for all purposes of mere utility, and for the moderate use of water for ornamental purposes; but it is, doubtless, to be regarded as the minimum supply desirable. The water-pipe system is adapted to an extended service, as the additional supply may become available, and as future occasion may require.

A recapitulation of all the works that have now been constructed for superficial and sub-drainage, and for supplying the Park with water,—consisting of sewers, pipes, and tile-drains, and the iron and cement water-pipes,—shows an aggregate linear extent of 398,764 feet, or $75\frac{1}{2}$ miles.

The completion of the several systems will make this aggregate about 110 miles.*

It is worthy of remark, that this extent of work, which performs so essential a part in the successful improvement of the Park, and, in developing its attractions, is wholly underground and hidden from observation.

The statement of the aggregate linear measurement, together with the brief descriptions that have been given of some of the leading parts, will suffice to give a general knowledge of the scope of the work, and of the amount of labor involved; but it is only by a reference to the working maps, and plans in detail, that an adequate idea can be formed of the entire arrangement, the adaptation and working of the respective systems.

The large area of the Park which is broken into undulations of all degrees, from precipitous to long, gentle slopes, receives the heaviest showers of summer, and the water,—instead of accumulating in rushing streams and gulying the grounds,—quietly and harmlessly disappears below the surface, and is gathered in the veins and arteries of the drainage systems, and passed off to supply the ponds, or is discharged from the Park in the same unperceived manner. When a shower has subsided, its inconvenient effects soon disappear, leaving undisturbed lawns, and the roads and walks comparatively dry, and fit for immediate use. The Croton water, at all points where it is desired, appears at command, or ascends in fountains, at the appointed places; but the 110 miles of channels, and the various connected works through which all this is performed, are unseen, and show

* This is exclusive of $5\frac{1}{4}$ miles of mains, sewers, and drains, of the Croton Aqueduct Department.

no evidence of the connection that exists between the effect and the cause.

The direct practical results alone, are all that will arrest the attention of visitors or ordinary observers. Other works of the Park exhibit to the view their various purposes of utility and ornament, in more or less detail, and are accessible for inspection and repairs; but these spread out beneath the surface their extended reticulations, and perform their principal functions silently and unseen, and can be approached and examined only by indirect means.

These facts give to this class of work a special interest, and show the necessity of special care and attention being given to works so situated to maintain them in successful operation.

A reference to the maps, and an acquaintance with all the details of the works being indispensable in their safe management, pains have consequently been taken to preserve a full and clear record of the whole as the work has advanced; and the arrangement, when complete, of maps, drawings, and particular directions, will be made as simple and as easy of reference as practicable.

VI.—FERTILIZING AND FINISHING GROUNDS.

The number of acres of ground that has been fertilized and finished, and either seeded and planted, or prepared for seeding and planting, during each year since the improvement of the Park was commenced, is as follows:

1858.....	31 acres.
1859.....	67 $\frac{1}{2}$ "
1860.....	100 $\frac{1}{10}$ "
1861.....	74 $\frac{4}{10}$ "
Total.....	273 "

The total area of ground fertilized and finished, and chiefly seeded and planted with trees and shrubbery, up to this date, is represented on the map by green coloring. This area, together with the ponds, roads, and other finished works, constitutes about $\frac{54}{100}$ of the total area of the Park,

omitting Croton reservoirs and transverse roads. The finished portion is principally south of Eighty-sixth street. Progress has also been made, with other portions not yet finished.

This work is, in some respects, a continuation of the work of "grading and shaping grounds," but being separated from it in order of time, and also being carried on by different processes, it is considered as a separate class of work.

Fertilizing consists of preparing the surface of the ground,—by stirring in, to proper depths, manures, after it has been graded and approximately shaped—for seeding down in lawns, or for planting with trees and shrubbery. Finishing follows, or is done in connection with fertilizing, according to circumstances, and consists of perfecting undulations and contours of ground, more completely than can be done by the operation of "shaping," and trimming, and smoothing the final surface. This work is generally of a light character, being limited to a depth of ground of a few inches only.

The process of fertilizing extends to a greater depth, and involves a greater amount of labor. Several different methods are pursued in performing this work, depending upon a variety of circumstances, conditions of the ground, &c.

1st.—Fertilizing "*natural ground*."

Where tracts of ground have been so situated as not to require any material change of surface in the general work of improvement, they have been fertilized by trenching or by plowing with the subsoil and the common plow, incorporating with the original soil such an additional quantity of vegetable mould or fertilizing materials as was needed. In rocky districts, and where the ground was occupied by trees or shrubbery which it was desirable to preserve, the ground has necessarily been trenched and fertilized by the use of the spade alone.

The depth of the trenching, quantity and kinds of fertilizing materials used, and other details of the process, have varied with different localities.

The soil, where the ground has been worked in its natural state, has, as a general rule, been found light and meagre, requiring liberal additions of fertilizing material, and thorough trenching or subsoiling. The exceptions have been small plots of ground interspersed about the Park that had been, at various times, cultivated as gardens and more or less fertilized, together with the swampy pieces of ground that contained vegetable or organic deposits, &c.

The original soil was, in large proportion, micaceous, with a subsoil of

hard clay, intermixed with stone and gravel. The rocky districts (not a small portion of the whole) were thinly covered with poor soil, except the irregular depressions that were receptacles of clay and boulders, with muck or vegetable matter occasionally superimposed.

The swamp ground has mostly undergone changes to such an extent, by cutting down or filling up, that but little of it can be said to be fertilized in its natural condition or *in place*. The portion of the Park ground therefore, to which as yet the term "natural ground" applies in the process of fertilizing, is limited to the more elevated surfaces and embracing the rocky and wooded and least fertile districts.

These circumstances will account for the extent of labor and materials that has been applied in properly fertilizing such ground.

The quantity of ground fertilized in this manner, up to this time, is 118 acres.

In the case of trenching, the fertilizing material used has been worked in in the following modes :

1st. By depositing it in the trench in successive layers, with earth between each layer, from the bottom of the trench upward ; this mode was applied to the coarser, uncomposted manures in the deeper trenches.

2d. By spreading the material on the rear slope of the trench, from bottom to top, and casting over the earth upon it ; and—

3d. By spreading it over the surface of the ground, and turning it in in that manner.

Again : where two distinct kinds of fertilizing material have been used, as night-soil compost, and horse manure compost, the first has been worked in by trenching, or plowing ; and the second, afterwards spread over the surface, and spaded or plowed in to a depth of six to eight inches.

2d.—*Fertilizing "made ground."*

Ground that has undergone changes of surface to the extent of the removal or transposition of the natural soil and subsoil, is termed "made ground."

The change of surface, whether caused by excavating and removing the original material, or by filling other material above it, involves the necessity of forming a new soil.

All ground upon which such changes are contemplated is first "mucked,"

or stripped of the old soil, which is removed and placed in piles, at convenient points, for subsequent use. If the subsoil is considered sufficiently valuable, portions of it are also removed and reserved.

Ground that has been excavated below the original subsoil—in case the material is found suitable—is treated by deep plowing, and removing the stones, for the purpose of forming a new subsoil. If the material is unsuitable, the new subsoil is formed from material brought from other localities. The latter is the case in all excavations that reach the underlying rock, or that are made in rock. Also, in filling, the crude materials that are generally used, such as stones, quarried rock, soft, decomposed rock, &c., require a covering of suitable selected earth, for a subsoil, before the surface soil is put on. The depth of subsoils (made from deposited materials), is from one to three feet, according to circumstances—the quality of the material below—the purpose for which the ground is intended, whether for planting with trees of large growth, with shrubbery, or for grass.

The new surface soil is variously composed—of the old soil that has been previously removed, or of similar soil, or vegetable mould, or muck, brought on from other portions of the Park, or from outside. It is spread evenly over the surface; and the depth, exclusive of fertilizing materials,—which are subsequently introduced in varying proportions, according to the necessities in each case,—is usually about one foot. Before depositing it, the subsoil, if not in suitable condition, is freshly plowed, and all lumps well pulverized, and any stones brought to the surface removed.

The manner of applying and working in fertilizing materials, manures, composts, &c., by plowing and trenching, together with the quantities and kinds used, are, in general, the same as in the case of “natural ground.”

About 163 acres of finished ground, including both natural and made ground, have been trenched, of which

37½	acres	have been trenched from 30 to 36 inches deep.
55½	“	“ “ “ “ 18 “
41½	“	“ “ “ “ 14 to 16 “
28½	“	“ “ “ “ 10 to 12 “

The balance has been plowed about as follows :

61	acres	.....18 to 20 inches deep.
11	“	.....14 to 16 “
38	“	.....10 to 12 “

Manure and Compost.—The old soil that is removed in making changes

of ground, together with other soil obtained, as has been mentioned, is composted, in piles, at convenient places, with stable manures, and also with night-soil, and remains in bulk until sufficiently fermented and rotted to fit it for use.

The process is aided by turning and stirring with the spade, as considered necessary. The freshly cut lawn grass, together with leaves and other refuse vegetable matter collected about the Park, and droppings upon the roads, are also composted with lime, and, in some cases, with mould or soil.

The horse manure, when received fresh, is first piled, and is turned, watered, and partially fermented, before using it in compost. When sufficiently fermented, it is mixed with soil, in alternate layers of about twelve inches of manure and six inches of soil, making a compost, after standing a sufficient length of time and being turned and prepared for use, of about equal proportions, as to bulk, of manure and soil.

The night-soil is deposited as received, in broad pits, and is mixed with about seven parts of soil to one part night-soil. After lying a few weeks (in summer), and undergoing fermentation, it is ready for use.

Street manure has been used, mixing it directly with the soil in trenching and plowing, and adding with it a small amount of a mixture of lime and salt. Guano, poudrette, phosphate of lime, bone-dust, and cheval have also been used in limited quantity. These last-mentioned materials were used in the proportion of five bushels to an acre of ground, for the purpose of producing a green crop to turn under, as a part of the process of fertilizing. Shell-lime, in the proportion of seventy-five bushels per acre, has also been used, mostly as a top dressing in special cases.

The rule in applying night-soil compost, and horse-manure compost, has been, to give about three hundred cart loads per acre of the former, and two hundred and twenty-five cart loads per acre of the latter. Both coats of compost have generally been applied to the same ground (and worked in in the manner before described); but, in some cases, only one coat has been applied. The quantity, whether applied in two coats or one, depends entirely upon the condition of the ground. These two kinds of compost have been the principal fertilizing materials used.

The finishing of ground relates to the more superficial process of perfecting the surface—by correcting irregularities, reducing, or (as the case may be) increasing undulations, by shifting, from place to place, small quantities of the surface material. The work is done by the spade and rake, and by harrowing, and is limited to such a depth as not to effect, injuriously, the soil, which, in most cases, has been previously fertilized.

Lumps of earth are pulverized or raked off, together with stones, and any other substances found that are not suitable to remain.

The seeding is done in connection with the finishing, the seed being raked in; and, when done, the ground is smoothly rolled by hand, or horse-rollers. Before the first mowing of the new grass, any stones that may be exposed on the surface, are again picked off.

The following statement has been made by Mr. William Curr, who has had charge of the seeding of ground :

Grass and other seeds used in seeding down the Park.

The grass seed sown has for the most part been *agrostis vulgaris*, or red-top grass. On a portion of the grounds, *agrostis stolonifera*, or English lawn grass, has been sown, both at the rate of two and a half bushels per acre, with two pounds white clover-seed to each bushel of grass-seed. In the early part of spring, grass and clover-seed only have been sown, but in the months of June, July, and August, millet has been used with the grass and clover-seed at the rate of one pound and a half to each bushel of grass seed. The purpose of sowing millet was for the protection of the young shoots of grass and clover from the scorching rays of the summer sun. In the fall months, rye has been used, instead of millet, for the purpose of giving protection to the grass through the winter months. The "Green" (D) west of the Mall was sown with rye, and the east and west meadows (F and G), in the upper part of the Park, were sown with buckwheat, the green crops in each case being plowed in. The ground was then manured with horse-manure compost, and cross-plowed and harrowed before the grass-seed was sown. The seed was raked in, stones and rubbish removed, and the ground smoothed with the horse-roller.

In other parts of the Park, the grass-seed was raked in and rolled with the hand-roller, except in places where the roller could not be used, owing to the steepness or inequality of the ground. Such places were smoothed by being slightly clapped with the back of the spade.

When the millet, sown with the grass-seed, got to be six or eight inches in height, it was cut with the scythe and raked off. When a second growth commenced, it was again cut at a similar height and carried off. The millet now ceases to grow, and the grass and clover are strong enough to take care of themselves.

The rye sown in the fall keeps green all winter, and in the latter end of April is cut with the scythe, and in the middle of May is cut again, leaving a good sward of grass.

THE PARK FORCE.

Organization.—The following statement applies to the organization and working arrangements of the Park force, as they have heretofore existed, while the largest amount of work was being carried on.

During the last year, the force was considerably reduced below the previous average; in the latter part of the season it was diminished to about 800 men, and at the present date consists of only 300 to 500 men, who are irregularly employed during favorable weather.

In resuming the usual operations in the ensuing spring, the organization—which is necessarily modified, as applied to a small force—will be resumed in the established form, as here described. The organization of the constructing force of the Park, and the methods that have been perfected for its efficient management, are briefly as follows:

* The force is arranged in gangs of from twenty to fifty men; over each gang is placed a foreman, and, when necessary, (the gang being divided) an assistant foreman.

The gangs are grouped in divisions—six to ten gangs making a division—and over each division is placed a general foreman. The general foremen, as well as the foremen, are responsible for the efficiency of the men under them, as well as for the economy and manner of doing the work, in carrying out the orders given them.

The whole force is under the special daily supervision of the Assistant Superintending Engineer.

The method of keeping and returning the time of the men is such as to ensure accuracy and honesty, and is as follows: Each foreman is provided with two time-books, with the names of his men written therein, and so ruled and headed that, at roll-call, he has only to make a check mark opposite the name of each man present; or, if the man comes or leaves at irregular hours, the foreman marks the hour in the proper column, "came" or "left."

There are three roll-calls each day. In calling the roll, the men are required to form a line, and as each man's name is called by the foreman, he steps out, and is identified by the assistant foreman, or, if the gang has no assistant foreman, by a man selected for the purpose, who responds to the answer, "right," or if the man called is not present, he answers

* This statement has been prepared by Mr. M. A. Kellogg, Asst. Sup. Eng.

"absent." At the last roll-call for the day, the foreman states aloud, as each man's name is called, the number of hours he has made that day.

The time-books are collected by the Pay Department, where the computations of hours worked are made up, and the books re-distributed each day.

The foremen, at the end of each pay term (of two weeks), are required to make an affidavit to the correctness of their returns.

Besides this, as a further check, the general foremen are required, each day, to count the number of men in one or more of their gangs, and report the same to the office, where the count is compared with the foremen's returns. This is done as a security against any discrepancy or dishonesty that might occur in marking "present" any man who was absent, or not in line, at roll-call. Ten hours per day are worked from about 1st April to 15th November, and during the winter, nine hours, except when prevented by the weather.

Foremen and assistants are required to be upon the work constantly during work hours, unless they have leave of absence, or in case of sickness, for which time they are not paid.

When the weather prevents work, and on holidays, they are required to report to their general foreman within thirty minutes after the time for commencing work, and if their services are not required, they are dismissed for the day, after reporting to the Disbursing Clerk for the purpose of having the time of their gangs, for the previous day, copied from their books.

The time of foremen, assistants, and men in the gangs, is all returned by the hour.

The men are paid by the Disbursing Clerk every two weeks. During the summer months they are paid on the work; in winter they are paid at the office, after working-hours.

It is the duty of all officers of the Park, and of foremen, to report daily, all cases of neglect of duty, inefficiency, or insubordination, for which, after investigation at the office of the Superintending Engineer, the offenders are reprimanded, suspended temporarily from duty, or discharged.

Men who have been absent from work three days, cannot resume their places without a written restoration from the office, which is only given when a sufficient cause is shown for absence, accompanied by a certificate of previous good conduct from their foreman.

Any person who has a complaint or a request to make, or who desires to answer a charge made against him, can call at the office of the Superintending Engineer, between the hours of 12 and 1 P. M., where the case is invariably attended to.

THE ENGINEER CORPS.

The Engineer Corps consists at present of—

- 1 Principal Assistant Engineer,
- 6 Assistant Engineers,
- 2 Plane Table Surveyors,
- 2 Draughtsmen, and
- 5 Rodmen, with 12 to 14 axmen, and laborers as occasion requires.

There are also employed in computing and keeping the accounts of labor and materials, five office Assistants; one Assistant to the Superintending Engineer is employed in the Construction department, in special charge of the working force, attending to the distribution of supplies and materials, &c.; one clerk, and one copyist, and two messengers are attached to this department.

The duties of the Engineer corps are more varied, and in many respects are of a different nature from those required upon public works in general. Besides attending to work that is governed by exact plans and rules of construction, much attention is necessarily given to carrying out instructions that apply to work of a different character peculiar to the Park.

The estimates and accounts of work done by the Park force, and by contractors, require a large share of labor; and much care and vigilance is necessary, where work in great variety and detail is spread over so large a district, to gauge the numerous operations and keep them within a proper range of expenditure, and at the same time secure the thorough workmanship and completeness of finish that is desired.

I have much satisfaction in acknowledging the intelligent and faithful manner in which the assistant engineers and the members of the corps generally have discharged these duties. To Messrs. M. A. Kellogg, and J. H. Pieper, principal assistants, prominent credit is due, for their co-operation and valuable services.

Some of the principal drawings that were intended to accompany this Report have been deferred.

Respectfully submitted,

WM. H. GRANT,

Superintending Engineer.

REPORT ON NOMENCLATURE OF THE GATES OF THE PARK.

To the Board of Commissioners of the Central Park :

The Standing Committee on Statuary, Fountains, and Architectural Structures, to whom was referred the subject of the nomenclature of the Park, respectfully report :

That the lower Park having now assumed its final shape, and the different avenues leading to it being in such an approximate stage of forwardness, as to admit of an early completion of the various entrances that directly connect the city with this portion of the work ; special designations are much needed for the gateways, and the proper time seems to have arrived for a final consideration of this interesting part of the general design.

That the Park is to be enclosed, seems to have been assumed in the action of the Board, although the intention is not yet expressly declared.

There are examples of Parks, in populous cities, without enclosures ; but the necessity for a permanent enclosure to the Central Park, for the preservation of order and the protection of property, can hardly be questioned.

The character of this enclosure, as yet undetermined, will necessarily be decided by the extent of means at the disposal of the Board ; but whatever style or material may be adopted, it is evident that entrance ways will be required at proper intervals, and preparation has accordingly been made for them in the general arrangement of the design.

These entrances are twenty in number, some of more immediate importance, and others destined always to be in a measure subordinate, because of the lesser currents of ingress and egress that they are designed to accommodate, but all requiring to be arranged with primary respect to the public convenience, and with a certain degree of architectural fitness.

Immemorial custom has sanctioned the practice of giving names of dignity to the gates or entrance-ways of cities, which, in ancient, as in more modern times, were walled.

The gates of ancient cities were places of great military and civic importance ; through them the people poured to their agricultural or pastoral pursuits, to return again for protection at night.

In Hebrew cities, and probably in those of other Eastern nations, they were places of meeting or appointment for business transactions, and, as the great mass of the people passed through them, they were convenient

points for this purpose. They were also assembling places, and the elders sat at the gates to administer summary justice. They were places as well of judgment as of execution; they seem to have been places where proclamations or notices were made to the people, and were places of resort for those purposes for which people generally assemble.

The practice of giving names to these gates is almost as ancient as are the records of history. Names were sometimes, as we learn from the many examples in the Scriptures, drawn from local circumstances, as the Corner Gate, the Valley Gate, the Prison Gate, the Gate of the Fountain, the Water Gate, the First Gate, the Middle Gate: sometimes from conspicuous dignitaries to whose use they were especially assigned, and which were considered gates of especial honor, as the King's Gate—"to stand in the gate of the children of the people, whereby the Kings of Judah come in, and by which they go out;" sometimes from the points of the compass, as the North, East, South, West Gate; sometimes they were given in honor of tribes of people, as the Gate of Benjamin—"the gates of the city shall be after the names of the tribes of Israel;" sometimes the name was drawn from the business transacted in the vicinity, as the Horse Gate, the Sheep Gate, the Fish Gate, the Dung Gate.

The word "gate" has also become the representative of power and dominion, as "the gates of hell shall not prevail against it," and the perfect security and peacefulness of the Heavenly City is beautifully described when it is said "the gates of it shall not be shut at all by day, for there shall be no night there."

The custom of designating gates by distinct names has been continued in mediæval and in more modern times, and its universality denotes the existence of a necessity which will find some mode for its satisfaction.

The naming of cities, of rivers, and of all geographical features, originates in a similar desire for an easily recognized and popular title; and streets, places, and houses also require to be conveniently named, because the popular demand insists on a brief, apt and convenient designation for all localities to which general resort is had.

A local circumstance or feature that has determined the name of a locality often fades away before improvement, leaving the name without any apparent reason for it; but it is difficult to effect a change in the name, although the circumstance or incident that gave rise to it may have passed entirely out of mind, because it has a recognized place in the popular vocabulary, from which it cannot, without great inconvenience, be dislodged; it has, perhaps, entered into the literature of centuries; it has been used as a means of description in conveyances, or other legal documents, and in so many ways has become useful, that a change would lead to serious embarrassment.

The same considerations that give names as convenient designations of locality to the gates of cities, obtain in a great place of public resort like the Park, and the popular convenience will manage somehow to affix local names that cannot readily be effaced, unless appropriate ones are suggested, and supplied in season by the proper authorities.

There is indeed already growing up a catalogue of designations of localities about the Park, that will quietly take possession of the field, unless other provision is soon made.

While this question of nomenclature requires careful adjustment in connection with every part of the Park, its importance is more particularly evident in the case of the entrance gateways, as they will naturally attract a large share of public attention, and be constantly spoken of by name, on account of the conspicuous purposes they serve, and the prominent position they occupy ; it is therefore desirable, not only that they should be made as agreeable as possible in design, but that they should be named in accordance with some simple but comprehensive plan that will fully meet the every-day wants of the public, and at the same time be unobjectionable in other important respects.

The monotonous numerical system used to distinguish the thoroughfares of New York is at once felt to be unsuitable for Park use, and but few suggestions of much greater value appear to be offered by other metropolitan cities.

In London, for example, we find that as no provision for names was made, nicknames like Billings-gate, Aldersgate, Cripple-gate, and High-gate, have been allowed to pass unquestioned into general use. In Paris, on the other hand, more care has been taken in the first instance, and titles like *Porte St. Denis* and *Porte St. Martin* have been given to the different city gates ; but the idea thus embodied can hardly be considered appropriate for use on the Central Park.

The plan often adopted in Europe of commemorating some brilliant victory in the name given to a new public work, possesses considerable attractions, and the *Pont D'Arcole*, the *Rue de Sebastopol*, *Waterloo Bridge*, and *Trafalgar Square*, seem to be well named : it is a plan, however, somewhat unsuitable for adoption in a public pleasure ground, that is especially intended for recreation and repose, and which should, therefore, rather speak of peace and good-will than of sanguinary contests.

Several other suggestions naturally occur that are more or less worthy of consideration in such a situation.

Thus, the names of the different States of the Union, or of the important cities, or of the most prominent men, may be used ; but with all propositions of this and of a kindred nature the difficulty at once arises,

that the opportunity is insufficient to fairly exhaust the subject, and that every selection, however carefully made, is liable to the objection that it will seem partial and invidious.

It will, moreover, in all probability, be thought desirable that the Park itself should, in some way, indicate the special nomenclature to be used; it may, therefore, be worth while to consider whether it offers any leading ideas of sufficient scope and general interest to deserve expression in the names of the different entrances, and of a character that will readily admit of varied artistic treatment in the gateways themselves.

Although, as already stated, there are twenty entrances to the Park, special interest attaches to the four gateways on Fifty-ninth street, because they directly face the large portion of the city already built up, and are always likely to be the most thronged.

Their position thus seems to require that the names by which they are to be known, should collectively express a single idea that will admit of further development in detail in the other less prominent gateways,

The construction of the Park has been easily achieved, because the industrious population of New York has been wise enough to require it, and rich enough to pay for it: to New Yorkers it belongs wholly, and these four principal gateways may, perhaps, be allowed to recognize this proprietary right, and to extend to each citizen a respectful welcome.

It should, however, be remembered in this connection, that while the Park is intended as a place for freedom and relaxation, for play, and not for work, it has been constructed with no idea of encouraging habits of laziness, or in any way for the benefit of idlers and drones; it is an extensive pleasure-ground, planted conveniently in our midst, so that innocent recreation may quickly follow peaceful labor, and its paramount object is to offer facilities for a daily enjoyment of life to the industrious thousands who are working steadily and conscientiously in the great city which spreads in every direction around it. The pervading sentiment embodied both in its original conception and in all the details that appertain to its actual execution, may, in fact, be briefly expressed in the three words, "Pleasure with Business;" or, for the sake of still further generalizing the whole idea, we may take the nobler words, "Beauty with Duty."

If an attempt is made to analyze the various industrial pursuits of a large city like New York, it will be found that they may be easily grouped under a few leading heads.

We have, first, that portion of the population whose sphere of usefulness is manual labor. This large and important class contributes to the prosperity of the community all the hard, positive, tangible work that is

done, and it deserves, on entering the Park, a hearty and respectful recognition. It should scarcely be distinguished, however, by such terms as "laborer" or "mechanic," for every laborer may bring some skill and wit to his work, and every mechanic may show some degree of taste and cleverness in the exercise of his craft: the word "Artizan," on the other hand, seems to present the whole idea in its more comprehensive and desirable aspect, and is, perhaps, the most characteristic title that can be used.

In close connection with the industrial idea suggested by the term "Artizan," will be found another which may be readily conveyed by the word "Artist." The business of the artist is to give animation and grace to the work that is done in the world, and to show that only the dull, the selfish, and the fainthearted, need to labor under the primal curse, for that work is a fruitful blessing, both in its performance and its result, whenever it is thoughtfully conceived, and beautifully executed. In this class will naturally be included all whose pursuits are directly connected with the idea of "Design," either in the leading arts of music, painting, architecture, and sculpture, or in the numberless supplementary arts, that, with the advance of civilization, have grown out from these parent stems.

The next important generalization that suggests itself, is that expressed by the word "Merchant," for it is necessary not only that work should be done, but that its results should be gathered together with prudence, and wisely distributed for the best advantage of all concerned; and this good office is performed by the merchant under many different names, such as "Banker," "Broker," "Importer," "Trader," "Agent," "Director," "Store Keeper." The prosperity of every community must necessarily depend to a great extent on the successful development of the general idea that is embodied in these various terms, and as the city of New York is the commercial centre of the whole country, it is especially desirable that it should find an adequate recognition in connection with the Park.

There seems to be yet one other class of laborers who cannot be correctly distinguished, either by the term "Artizan," "Artist," or "Merchant," and this is the class that includes the Poet, the Divine, the Statesman, the Lawyer, the Author, the Editor, the Teacher, the Physician, the man of Science, and all in fact, whose contributions to the welfare of the community, are of a specially intellectual character.

The word "Scholar," perhaps expresses the generic idea with sufficient completeness, and if we add this term to the three already mentioned, we have a group of four names bearing a mutual relation one to the other, and embodying in a general way, and on an equal footing, so far as the

Park is concerned, all the industrial ideas that are entertained in a civilized community.

In the remaining gates, the dependence of the city on the whole country may be recognized, and its connection with other cities and other countries acknowledged; the importance of the domestic relations may be dwelt on, and the idea may be set forth that for the sake of peace, we must yet be prepared for war.

The first industrial idea outside of the city that seems to demand our attentive consideration, is that connected with the cultivation of the soil, for the sustenance of the metropolis is entirely dependent on agricultural labor, and it could with difficulty afford to be deprived, even for a day, of the supplies it is constantly receiving from this prolific source. The occupation of the agriculturalist is divided into many different branches, but all have sprung from the discovery that the most valuable products of the earth, both animate and inanimate, must be brought to perfection by careful culture, before mankind can reap from them the full advantage they are capable of yielding. This generalization would naturally include all the labor that is devoted to rural pursuits, and its representatives would be the farmer, the grazier, the planter of grain, flax, hemp, rice, cotton, sugar, and tobacco, the fruit-grower, and the gardener.

In the choice of a single term that may express in a suitable manner the various ramifications of agricultural labor, it is perhaps worth while to give especial prominence to the fact already mentioned, that the city is provided with its seemingly exhaustless supplies of food and raiment, almost entirely through the patient care and prudent foresight of the tiller of the soil, and if it is desired to lay particular stress on this characteristic idea of providence and forethought, it seems to be more simply and completely conveyed by the familiar word "Husbandman," than by any other term. If, however, it is preferable to express only the general idea of cultivation, this entrance may take the name of the "Cultivator's" gate, or the "Agriculturist's" gate.

In the event of the plan being carried out which was suggested some time since for widening to one hundred and fifty feet the Seventh avenue, north of One hundred and tenth street, and planting it with several rows of trees; the point at which this shaded country-like road will meet the Park, seems to be the most appropriate for the gate intended to be illustrative of country life.

Having thus given due prominence to the preeminently peaceful pursuits of agriculture, it is fitting that proper respect should be paid to the stern truth that peace is not always possible, the strong arm of the soldier being at times absolutely needed to sustain the whole frame-work of

society, and to secure freedom of action not only to the cultivator of the soil, but to all other peaceably disposed and illustrious members of the body politic.

It is evident, indeed, that every well organized community must contain within itself the elements of an army prepared, whenever the necessity arises, to strike boldly in defence of its just rights, and without doubt the claim of the "Warrior" to the grateful recognition of the city of New York will be at once allowed.

The "Warrior's" gate may, with propriety, be situated on the north side of the Park, facing Washington Heights, and in the immediate neighborhood of the old fortifications, that will continue to be preserved within the boundaries of the people's pleasure-ground.

The vocations which are followed by men who find in untamed and uncultivated nature a suitable field of action, are so various, that they require to be grouped under several distinct heads.

Thus we have the "Hunter" and the "Fisherman," both individual pursuits that contribute largely to the wants of the community.

The term "Woodman" may represent all the labor that is devoted to procuring such important staples as lumber, bark, charcoal, pitch, tar, rosin, and turpentine; and the term "Miner" seems to include the workers in coal, and the different ores, and also the quarrymen or miners of stone.

The prosperity of every metropolis depends to an important extent on the channels open to it for ready communication with the rest of the business world. In a city with such an immense shipping interest as New York, one branch of this idea will be typified by the "Mariner," who is forever carving out a new public highway over the ocean, the river, or the lake, and the other equally important branch will be represented by the "Engineer," who provides the community with all the facilities it possesses for overland transportation, and also contributes to its welfare in many other ways. The highroad, the plankroad, the railroad, the canal, the breakwater, the dock, the tunnel, the viaduct, the aqueduct, and the reservoir are all called into existence by his skill and indomitable perseverance, and there can be no question but that the general ideas conveyed by the terms "Mariner" and "Engineer," deserve a ready appreciation in connection with such a public work as the Park.

The Mariner's gate should perhaps be situated in the immediate vicinity of the highest ground contained within the Park limits, so that on entering or leaving it a suggestive view may be offered of the hills beyond the harbor in the distance, and of the two busy rivers that float by the city.

The Engineer's gate may with some propriety be placed on the east side of the new reservoir, where "Beauty" cheerfully gives way to "Duty,"

and the good cause of temperance and cleanliness requires that the plan of the people's pleasure-ground shall conform closely to the lines of an equally popular, but more strictly useful, engineering work.

Having thus generalized all the preeminently practical pursuits of life, and acknowledged the obligations that the city is under to those who follow them, it is fitting that a welcome should be extended to the men who devote their energies to making new discoveries that enlarge the field of human action and add to the value of civilized life. The labors of such men as Columbus and Hendrick Hudson can never be forgotten, and their lofty vocation, even if they alone were its representatives, must always be held in grateful estimation by the citizens of New York.

The example set by them has, however, been so diligently followed, that a glance at the numerous expeditions that have been undertaken by Americans within the experience of the present generation, is sufficient to establish the claim of the "Explorer" to a cordial recognition.

Akin to this idea, and yet widely differing from it, is that of the "Inventor," whose labors are devoted to the study of natural laws, and to a searching analysis of the various mechanical possibilities that are within the scope of human effort, with a view to combine the results of the knowledge thus obtained in such a way as to confer fresh benefits on the race. To this class of minds we are indebted for the printing-press, the steam-engine, the electric telegraph, and for a thousand other but little less important discoveries.

The various industrial ideas that are constantly working to the advantage of a metropolis, having been thus typified, it seems desirable in a public work like the Central Park, to give attentive consideration to two ideas of a somewhat different character, before proceeding to the embodiment of the domestic relations which are of such vital interest to the well-being of every civilized community.

The one is, that the city, although metropolitan by position, is cosmopolitan in its associations and sympathies, and is ever ready to extend a courteous welcome to all peaceably disposed "Strangers," or "Foreigners," who may be led by inclination or business to pass their time within its boundaries; this welcome being offered, however, not merely as a matter of courtesy, but as a recognition of the fact, that it is highly important, both to the general and the particular interests of the whole nation, that its cities should be visited, and its institutions studied and comprehended by intelligent and industrious travellers from other countries, for by such means only can unworthy prejudices be removed, and incorrect estimates rectified.

The Foreigners' gate may also, in its sculptural decoration, directly acknowledge the obligation that the owners of the Park are under to

liberal and disinterested men of other nations, like Lafayette, for instance, who, in times past, have given active aid, and who, at the present hour, are rendering important service to the best interests of the Republic, of which the city of New York is the commercial centre.

The other idea remaining to be developed is, that, while the success of a metropolis springs, to a considerable extent, from the activity and energetic industry of the individuals who contribute to its material and intellectual advancement, its real prosperity depends, in a far higher degree, on the virtue and integrity of the citizens who live in it, and of the rulers who are intrusted with the control of its affairs; it seems desirable, therefore, to have one gate to the Park, that, under the name of "All Saints," will respectfully acknowledge the importance of the influence that is exercised, to a greater or less degree, over the whole community by the pure and holy men of all ages, whose beneficent example has helped to raise the standard of public morals, and give elevation to the idea of private character.

Although the Park is intended to afford ample opportunity for personal relaxation and repose to all the hard-working and energetic representatives of manly labor, it has another class of individuals to provide for, whose contributions to the prosperity of the metropolis are no less valuable, and whose claims to a loving welcome are equally deserving of illustration in the nomenclature of the entrance gates.

It aims to provide within the city limits an extensive rural play-ground, and a country experience generally, for the whole domestic circle, so that, in future, "The Boys," "The Girls," "The Women," and "The Children" may all have an opportunity to escape, at intervals, from the close confinement of the city streets, and to spend pure and happy hours in direct communication with the beauties of nature.

The Park is already used freely, and enjoyed heartily by troops of young children, and the Children's gate will help to keep in mind the fact, that, in the course of the next twenty years, the whole army of industrious workers, who are now vigorously laboring for the general welfare, must have received large reinforcements from the band of little ones who are to-day so tender and helpless, or its ranks will already be perceptibly thinned, and its efficiency seriously impaired.

The Boys' gate and the Girls' gate will convey the idea that ample opportunity for physical development is considered a necessary part of the free educational system of the city, and will recognize the fact that it is not thought sufficient for the young students of either sex to be liberally provided with schools, school-teachers, and school-books, but that they must also be induced to study freely the works of nature, and be led to an

intelligent appreciation of the sermons that are to be found in stones, the books that are printed in the running brooks, and the good that exists in everything that comes from the bountiful hand of the Creator.

There seems, moreover, a particular fitness at the present time in thus publicly recognizing in a pleasure ground like the Central Park, that an importance is felt to attach to the youth of both sexes, not as helpless sons and daughters, dependent on their industrious parents, but individually, as American boys and girls springing directly from God the Father of all, and freely given by the Omnipotent Creator to the whole world; for the sentiment thus conveyed may be looked on as a landmark showing the point to which, in a certain direction, the civilization of the nineteenth century has reached.

The crudest idea of government allows to a single individual despotic power over all his subjects; the feudal system, while limiting the scope, increases the number of the holders of power, and includes the idea of responsibility to some extent, but is still essentially despotic in principle.

The republican system of government, on the other hand, is based clearly on the idea of equal rights, and as civilization advances, this system, under various titles, is practically superseding the others. Feudalism has, however, long retained in "the family" the sway that it has lost in "the state," and it has been the time-honored custom throughout the world to consider "minors" as the subjects by Divine right of their parents.

The adhesion to the central idea of a republican government has been so thorough and complete in America during the present century, that it has had a gradual influence over this popular habit of contemplating the family relation from a feudal point of view, and as a habit, it may almost be said now to have lapsed into disuse. The change that has taken place, although quite natural, is a result of convictions formed with reference to different objects, and it has not yet attracted attention enough to secure its complete development. It is indeed a common criticism of foreigners on American habits and customs that the younger portion of the community are allowed to occupy a more prominent position than is altogether desirable, and the objection may, perhaps, be permitted to pass without denial, but we cannot fail to perceive that it will, in the future, be far easier to restrain the enlarged idea within proper limits than it was in the past to free it from the selfish popular error with which, for ages, it had been clogged.

If we seek for subjects of illustration suitable for the Boys' gate, David, with the sling, Casabianca, the young Tell, and other similar examples at once occur to the mind as universally recognized instances of heroism, obedience, and confidence that belong exclusively to the era of boyhood.

For the decoration of the Girls' gate we have the whole range of the poets, who delight especially in describing this evanescent and suggestive phase of feminine life, and who have given us expressive idealizations of all the more beautiful types of girlish character.

In the Women's gate, it is not intended to convey the idea that the various industrial pursuits recognized at the other entrances to the Park, are followed by one sex only, for the names of women who have distinguished themselves in the various arts and sciences of life, will readily suggest themselves to the mind of every one, but it is desired to express in an especial manner, a sense of the all-important services that are rendered by women in their domestic capacity alone, and to recognize the fact that as maids, wives, and mothers, they are justly entitled to a hearty recognition as valuable contributors to the happiness and prosperity of the whole community.

A list of twenty names is thus obtained that seems to be somewhat appropriate for the object in view. We have the Artizan, the Artist, the Merchant, the Scholar, the Cultivator, the Warrior, the Mariner, the Engineer, the Hunter, the Fisherman, the Woodman, the Miner, the Explorer, the Inventor, the Foreigner, the Boys, the Girls, the Women, the Children, and All Saints.—

The artistic adaptability of the general system of nomenclature above suggested, has already been proved, and worthy types of the Miner, the Trapper, and the Sailor, are now in existence, that have been conceived by American artists.

At present, it would only be desirable to arrange the gateways with a view to possible elaboration hereafter, for although it can scarcely be considered within the proper scope of the Commissioners to provide out of the Park funds, artistic decoration of a really high character, at all the various entrances, an outlet may readily be left open for future effort in this direction by private subscription, and if such an opportunity is offered in connection with a popular system of nomenclature, it will probably, in course of time, be accepted and improved, for each separate gateway will have a special claim to the affectionate consideration of some particular portion of the community.

In suggesting to the Board a systematic nomenclature that may be representative of the pursuits of the whole people, and of the vocations to which the city especially owes its metropolitan character, the Committee have not been unmindful of the difficulty of giving currency to unfamiliar names.

The Egyptian prison in Centre street, for instance, is called "the Tombs," by general consent, and unless familiar words and easy names

are adopted by the Board, it is possible that the nomenclature of the guide-books may by degrees be superseded by some other which accidental circumstances will provide for ordinary use.

Although a regular system seems to be a desideratum, it is not absolutely necessary, and it is evident that attractive names may be given to the gates without reference to any system, taking one perhaps of a distinguished statesman, another of a patron saint, others again from the constellations, the rivers, mountains, hills, lakes, trees, or flowers, or from the affections or the sentiments,—all would afford a nomenclature, varied, unsystematic, and uncontrolled except by fancy, and from so boundless a field, it would seem easy to draw names sufficient and appropriate; but it has not been found an easy task to select in this way names combining dignity and appropriateness, with that homely quality that will ensure their general acceptance.

While the nomenclature suggested above is the best as a system that has occurred to the Committee, it is quite possible that in individual instances, other names of the same signification may be substituted for those given, though the language has been very thoroughly searched for the words best adapted to express the ideas intended to be conveyed.

Dated New York, April 10th, 1862.

H. G. STEBBINS,	} Committee.
C. H. RUSSELL,	
AND. H. GREEN,	

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