

W. B. Van Dyke  
141

# DOCUMENTS

OF THE

## BOARD OF COMMISSIONERS

OF THE

## CENTRAL PARK,

FOR THE

YEAR ENDING APRIL 30, 1858.



NEW YORK :

WM. C. BRYANT & CO., PRINTERS, 41 NASSAU ST., COR. LIBERTY.

1858.

# BY - L A W S

OF THE BOARD OF

## Commissioners of the Central Park.

---

### I.—MEETINGS.

§ 1. All meetings of the Board of Commissioners of the Central Park, shall be held at their office, unless otherwise ordered by the Board.

§ 2. Stated meetings shall be held on the first and third Tuesday of each month; other meetings may be held by adjournment, on the call of the President, or at the written request of three members; the notices for meetings called by the President or by any three members, shall state the matter to be presented at such proposed meeting, and no other matter shall be acted on at such meeting, except by consent of eight Commissioners.

§ 3. The time of meeting shall be 3 o'clock in the afternoon; if a majority of the Commissioners shall not be present at 15 minutes past 3 o'clock, the meeting shall stand adjourned until the day of the next stated meeting.

§ 4. No meeting shall be held unless six Commissioners are present.

§ 5. Notices of meetings shall be served on each Commissioner by the Clerk, at least two days before the day of the meeting for which notice is given.

## II.—OFFICERS.

§ 1. The officers of the Board shall be as follows :

- I. A President.
- II. A Vice President.
- III. A Treasurer.
- IV. A Secretary—

Who shall hold office till the 1st Tuesday of May next succeeding their election.

§ 1. There shall also be a Chief Engineer, a Chief Clerk, a Superintendent of the Park, and such other persons as the Board may deem proper, professional or otherwise, who shall hold office during the pleasure of the Board.

### PRESIDENT.

The President shall preside at all meetings of the Board, except when absent ; then the Vice President shall preside ; the Presiding officer shall decide all questions of order subject to an appeal to the Board.

### TREASURER.

The Treasurer shall keep an account in the name of the "Board of Commissioners of the Central Park," at the institution selected by the Board as a depository of its moneys, and all moneys from whatever source derived shall be deposited by the Treasurer in said institution, immediately on his receiving the same. The Treasurer shall report the condition of the finances at each stated meeting.

## III.—VACANCIES.

§ 1. Vacancies occurring in the Board shall be filled at the stated meeting, next subsequent to that at which a notice of such vacancy shall have been announced to the Board, and shall be filled from the names of persons nominated at a meeting, previous to such election, to fill the vacancy.

§ 2. Resignations shall be by a written communication to the Board of Commissioners of the Central Park.

§ 3. Elections to fill vacancies in the Board, all officers of the Board, the Chief Engineer, Chief Clerk and Superintendent of the Park shall be by ballot.

§ 4. All other persons to be employed by the Board, shall be elected or appointed, as may be at the time determined by the Board.

## IV.—COMMITTEES.

§ 1. The following standing committees, each to consist of three Commissioners, except the committee on Salaries and Officers, which shall consist of five Commissioners, shall be appointed by the President annually, at the meeting on the first Tuesday of May, or at the next succeeding meeting.

- I. A Finance Committee.
- II. An Executive Committee.
- III. An Auditing Committee.
- IV. On Salaries and Offices.
- V. On Draining and Sewerage.
- VI. On Roads and Walks.
- VII. On Statuary.
- VIII. On By Laws and Ordinances.
- IX. On appropriation of grounds for special purposes.
- X. On Buildings in the Park.

- XI. On Printing.
- XII. On Trees and Plants.
- XIII. On Fountains.
- XIV. On the Annual Report.

The President shall be *ex officio* a member of all standing committees.

§ 2. It shall be the duty of the Finance Committee to report in writing to the Board, at least as often as once in each month, the condition of the funds, expenditures and receipts, the probable amount of funds required within the succeeding three months, and the necessary steps to procure the issue and disposition of funds or stock to be issued under the act creating the said Board.

§ 3. The Executive Committee shall be charged with such duties as may be, from time to time, referred to it by the Board.

§ 4. The Auditing Committee shall, at least once in three months, audit all the accounts of the Board, its officers and employees, and report in writing thereon to the Board.

§ 5. The Committee on the Annual Report shall prepare the report required by Section 6 of the Act creating the Board, which shall be properly attested by the President and Secretary, and transmitted to the Common Council.

§ 6. No Committee of this Board shall incur any pecuniary liability unless authorized by the Board.

#### V.—RULES OF ORDER.

The order of business at meetings of the Board, except otherwise ordered, shall be—

- 1st. Reading of the minutes of the previous meeting.
- 2d. Motions and Resolutions.
- 3d. Reports of Standing Committees.
- 4th. Reports of Select Committees.
- 5th. Miscellaneous business.

The Ayes and Noes shall be called and recorded on all appropriations of money ; and on all other questions at the request of one Commissioner.

All resolutions shall be in writing, with the name of the mover thereon, and shall not be considered until seconded.

All reports shall be in writing, and signed by a majority of the Committee to whom the matter was referred, and shall state the facts upon which the same is based, and their conclusions thereon.

No By-Law shall be altered, repealed, or adopted, without the report of a Standing Committee thereon, nor without the assent of a majority of the whole Board, nor at the same meeting at which it is proposed.

# STANDING COMMITTEES

OF THE

Board of Commissioners of the Central Park.

---

1.—*Finance.*

RUSSELL, GREEN, STRONG.

2.—*Executive.*

DILLON, BUTTERWORTH, GRAY.

3.—*Auditing.*

HUTCHINS, GRAY, DILLON.

4.—*Salaries and Offices.*

GREEN, BUTTERWORTH, RUSSELL, HUTCHINS, GRAY.

5.—*Draining and Sewerage.*

HOGG, FIELDS, ELLIOTT.

6.—*Roads and Walks.*

ELLIOTT, GREEN, HOGG.

7.—*Statuary.*

FIELDS, RUSSELL, BUTTERWORTH.

8.—*By Laws and Ordinances.*

GRAY, GREEN, HUTCHINS.

9.—*Appropriation of Grounds for special purposes.*

BUTTERWORTH, FIELDS, STRONG.

10.—*Buildings in the Park.*

STRONG, DILLON, HOGG.

11.—*Printing.*

GREEN, ELLIOTT, HUTCHINS.

12.—*Trees and Plants.*

HOGG, ELLIOTT, GRAY.

13.—*Fountains.*

BUTTERWORTH, RUSSELL, DILLON.

14.—*Annual Report.*

ELLIOTT, HUTCHINS, FIELDS.

# An Act

*For the Regulation and Government of the Central Park  
in the City of New York.*

**Passed April 17th, 1857, Three-fifths being present.**

---

The People of the State of New York, represented in  
Senate and Assembly, do enact as follows :

§ 1. So much of that piece or parcel of land, bounded southerly by Fifty-ninth street; easterly by the Fifth avenue; northerly by One Hundred and Sixth street, and westerly by the Eighth avenue, in the city of New York, as has been taken for a public place, confirmed by an order of the Supreme Court, bearing date the fifth day of February, in the year one thousand eight hundred and fifty-six, shall hereafter be known and entitled as "THE CENTRAL PARK," excepting out of said Central Park the land belonging to the State of New York, and occupied by and connected with the Arsenal, unless the city of New York shall acquire title thereto.

§ 2. The said Park shall be under the exclusive control and management of a Board of Commissioners, to consist of eleven persons, who shall be named and styled "The Commissioners of the Central Park." Three members shall constitute a quorum of the Board for the transaction of business; but no action of the Board shall be deemed final or binding, unless it shall have received the approval of a majority of the Board, whose names shall be recorded in the minutes.



§ 3. Robert J. Dillon, James E. Cooley, Charles H. Russell, John F. Butterworth, John A. C. Gray, Waldo Hutchins, Thomas E. Field, Andrew H. Greene, Charles W. Elliott, William K. Strong, and James Hogg, are hereby continued and constituted the first Board of Commissioners. They shall hold offices for five years, and shall receive no compensation for their services; each Commissioner shall, nevertheless, be entitled to be reimbursed the amount of his personal expenses in visiting and superintending the said Park, not exceeding the sum of three hundred dollars per annum. In case of a vacancy, the same shall be filled by the remaining members of the Board for the residue of the term then vacant; and all vacancies caused by expiration of terms of office, or neglect or incapacity of qualification, shall be filled by the Mayor, by and with the advice and consent of the Board of Alderman.

§ 4. The said board shall have the full and exclusive power to govern manage and direct the said Central Park, to lay out and regulate the same; to pass ordinances for the regulation and government thereof; to appoint such engineers, surveyors, clerks and other officers, except a police force, as may be necessary; to prescribe and define their respective duties and authority, fix the amount of their compensation; and generally in regard to said Park, they shall possess all the power and authority now by law conferred or possessed by the Common Council of said city, in respect to the public squares and places in said city.

§ 5. It shall be a misdemeanor for any Commissioner directly or indirectly, to be in any way interested in any contract or work of any kind whatever connected with said Park; and it shall be the duty of any Commissioner or other person who may have any knowledge or information of the violation of this provision, forthwith to report the same to the Mayor, who shall hear such Commissioner in regard thereto; and if, after such hearing, he shall be satisfied of the truth thereof, the Mayor shall immediately remove the Commissioner thus offending. Every Commissioner shall,

before entering upon the duties of his office, take and subscribe the oath prescribed by the constitution of this State, which oath when subscribed, shall be filed in the office of the Clerk of the city and county of New York.

§ 6. The said Board shall annually, and in the month of January in each year, make to the Common Council of the said city, a full report of their proceedings, and a detailed statement of all their receipts and expenditures.

§ 7. It shall be lawful for the Commissioners to let from year to year any buildings, and the grounds attached thereto, belonging to the city of New York, now being within said Park, until the same shall be required for the laying out and regulation thereof, when the said buildings shall be removed, except such as may be used for the purposes of the Park.

§ 8. It shall be lawful for the said Commissioners to sell any buildings, improvements and other materials now being within the said Park, being the property of the city of New York, which in their judgment shall not be required for the purposes of the Park, or for public use, the proceeds of which shall be deposited to the credit of the Commissioners, and devoted to the improvement of the Park.

§ 9. No plan for the laying out, regulation, and government of said park shall be adopted or undertaken by the Commissioners, of which the entire expense when funded shall require for the payment of the annual interest thereon a greater sum than one hundred thousand dollars per annum.

§ 10. The Mayor, Aldermen, and Commonalty of the city of New York shall, from time to time, create and issue a public fund or stock, to be denominated "The Central Park Improvement Fund," in such sums of money as shall be required by the said Board of Commissioners for the purposes of this Act; subject to the limitations prescribed by the preceding ninth section hereof: all the provisions of the

Act entitled "An Act to regulate the finances of the city of New York, passed June eighth, eighteen hundred and twelve," so far as the same may be applicable, shall apply to the stock or fund thus created; such stock or fund shall be redeemable in thirty years from the issuing thereof; and the said park shall be, and the same is hereby, specifically pledged for the redemption thereof.

§ 11. For the payment of the interest on the said stock or fund the Board of Supervisors of the city and county of New York shall order and cause to be raised by tax on the estates, real and personal, subject to taxation according to law within said city and county, and to be collected in addition to the ordinary taxes, yearly and every year until the whole amount of such fund or stock be paid, a sum of money sufficient to pay the interest annually accruing on said stock or fund, not exceeding the aforesaid limitation of one hundred thousand dollars per annum.

§ 12. The moneys raised upon the fund or stock hereby authorized shall be deposited as fast as the same shall be realized, by the said Mayor, Aldermen, and Commonalty, to the credit of the said Board of Commissioners, with the New York Life Insurance and Trust Company, or with the United States Trust Company of New York, or with a bank or banks, as either shall be designated by said Board; such company or bank or banks, shall allow interest upon such deposits as may be agreed upon with said Board, and shall open and keep an account with said Board. All moneys received by said Commissioners shall be immediately deposited with such company or bank to the credit of their account, and no moneys shall be drawn therefrom except upon a warrant signed by at least a majority of Commissioners, and countersigned by the Comptroller of the city, upon filing with him the receipt or other vouchers therefor; nor shall such moneys be drawn therefrom unless the same shall have been specifically authorized by the said Board, at a meeting thereof duly convened, and entered at length on their minutes.

§ 13. It shall be lawful for the said Board of Com-

missioners to agree with the Croton Aqueduct Board of the city of New York, for an exchange of lands belonging to the city of New York, now or hereafter in use for the Croton Aqueduct, and lying within the area bounded southerly by Fifty-ninth street; easterly by the Fifth avenue; northerly by One hundred and Sixth street; and westerly by the Eighth avenue, in the city of New York; provided the same quantity of land, within the said area, be given in exchange. Such deeds shall be executed and delivered between the parties hereto, as shall give effect to any agreement made under this section.

§ 14. It shall be lawful for said Board of Commissioners, at any meeting thereof, duly convened, to pass such ordinances as they may deem necessary for the regulation, use and government of said park, not inconsistent with the ordinances and regulations of the corporation of New York. Such ordinances shall, immediately upon their passage, be published for ten days, in three daily newspapers, published in said city, to be selected by said Commissioners.

§ 15. All persons offending against such ordinances, shall be deemed guilty of misdemeanor, and be punished, on conviction before the Mayor, Recorder, or any magistrate of the city of New York, by a fine not exceeding fifty dollars; and in default of payment, by imprisonment not exceeding thirty days.

§ 16. This act shall take effect immediately.

## Document No. 2.

---

### BOARD OF COMMISSIONERS, CENTRAL PARK.

---

COMMUNICATION ADDRESSED TO THE MAYOR OF THE CITY OF  
NEW YORK, BY JAMES E. COOLEY, ESQ.,  
PRESIDENT OF THE BOARD.

---

NEW YORK, 15th May, 1857.

Hon. FERNANDO WOOD,  
Mayor of the City of New York :

DEAR SIR,—I have the honor to enclose herewith resolutions of the Commissioners of the Central Park, pursuant to an Act of the Legislature, passed April 15th, 1857, authorizing the purchase of the New York Arsenal property, for the purposes of the Central Park, and to inform you that I have transmitted a copy of the same to the Commissioners of the Land Office, at Albany, requesting that a conveyance of said Arsenal property be made to the Mayor, Aldermen and Commonalty of the City of New York, in conformity with the provisions of the aforesaid Act of the Legislature. You are aware that this Arsenal property is situated within the, prescribed limits of the Central Park ; and that, if purchased at all by the city, on the reasonable terms provided for in the Act above alluded to, it must be

secured before the 10th day of June next, otherwise it will be offered at auction, as now advertised, in such parcels as may be deemed advisable by the Commissioners of the Land Office, and sold to whoever may then be inclined to compete for it.

Believing that you cannot fail to have a just appreciation of the importance of this measure to the city of New York; and, from appropriate allusions you have repeatedly made in your public messages, to the great work confided to the Commissioners of the Central Park, no less than from frequent conversations you have been pleased to hold with me on that subject, that you are desirous to witness its rapid advancement, I rely with much confidence upon your cordial co-operation, in conjunction with the co-ordinate branches of the city government, in providing the requisite pecuniary means, as authorized by law, to enable the Commissioners to carry forward that important public improvement to a speedy and successful completion.

I have, therefore, to request the favor of you to transmit a copy of this communication, with the accompanying resolutions, to the Honorable the Board of Aldermen, and the Common Council of the City of New York, with a recommendation that the necessary appropriation, hereby required, be made within the time prescribed by the Act authorizing this purchase; and, in accordance with the provisions of the Act, to alter the map of the city of New York, by laying out thereon a public place, and to authorize the taking of the same, passed July 21st, 1853.

I have the honor to be,

With much regard,

Very respectfully,

Your obt. servant,

J. E. COOLEY,

President of the Board Commissioners  
of the Central Park.

The following resolutions were adopted unanimously, at a meeting of the Board of Commissioners of the Central Park, held May 13th, 1857.

*Resolved*, That pursuant to the act of the Legislature, passed April 15th, 1857, "to authorize the sale of the State Arsenals,

in New York and Albany; to provide for the purchase of the New York Arsenal property, in New York, by the city of New York, and for the appropriation of the proceeds of such sales," this Board elect to purchase the State Arsenal, and all the grounds appertaining thereto, belonging to the State, situated in the city of New York; and that notice in writing to that effect, be given to the Commissioners of the Land Office.

*Resolved*, That notice of this proceeding be given to the Mayor, Aldermen and Commonalty of the city of New York; and the said Mayor, Aldermen and Commonalty be requested to provide the sum of two hundred and seventy-five thousand dollars, for the purpose of making the purchase aforesaid, pursuant to the Act authorizing the sale of the State Arsenals, in New York and Albany.

J. E. COOLEY, President.

CHAS. W. ELLIOTT, Secretary.

## **Document No. 3.**

---

### **BOARD OF COMMISSIONERS, CENTRAL PARK.**

---

**TUESDAY, MAY 26, 1857.**

The Committee on Buildings in the Park submitted a report as to the present condition of the Park, as follows :

The Committee on Buildings would respectfully report that many applications are made to them by persons now occupying buildings and grounds in the Park for a renewal of their leases, or for the privilege of remaining until the premises they occupy are needed for the purposes of the Park. Many of the applicants are market gardeners who have spent considerable sums of money for manures, and labor in preparing the ground, and to whom it is a matter of great importance to have the privilege of taking off a crop in order to be reimbursed for their outlay.

Others of the tenants are persons occupying shanties, keeping piggeries, goats and cows, which are allowed to run at large on the Park, destroying the trees and otherwise injuring the public property in our charge, besides being an intolerable nuisance to the better portion of the tenants.

Some of the buildings are also occupied as founderies, rope-walks, bone-burning establishments, &c. These generally are a



nuisance ; and by the number and class of persons who are employed in them, are more likely to be sources of annoyance and loss, than of profit.

Many of the tenants under the present condition of affairs—no person being adequately empowered to exercise authority over them—are taking advantage of this circumstance to destroy the fences, and to enclose lands for grazing and other purposes which were never let to them, but, on the contrary, were let to other parties. This gives rise to continual quarrelling and disturbance. Persons, also, who are not residents in the Park, such as milkmen and others, now pasture their cattle within its bounds, using it as a common, and doing great injury. In view, therefore, of the necessity of immediate action in the premises your Committee would ask the privilege of appointing some person as their agent *pro tem.*, to collect the rents and take charge of the property under their care ; and further, that the Board would be pleased to authorize the sale of such buildings in the Park as in the opinion of your Committee it may not be to the public advantage or interests to retain.

WM. K. STRONG, } Committee on Build-  
JAMES HOGG, } ings in the Park.

Dated New York, May 26th, 1857.

## Document No. 4.

---

### BOARD OF COMMISSIONERS, CENTRAL PARK.

---

**TUESDAY, JUNE 2, 1857.**

Mr. GREEN, of the Finance Committee, presented a report and communication to the Mayor, Aldermen and Commonalty, with the following resolution :

*Resolved*, That the accompanying communication be adopted by the Board, and that the same be properly attested by the President and Secretary and forwarded to the Mayor, Aldermen and Commonalty of the city of New York.

The said report, communication and resolution were unanimously adopted.

---

TO THE MAYOR, ALDERMEN AND COMMONALTY OF THE CITY OF NEW YORK :

The Commissioners of the Central Park have the honor to state, that during the few weeks that have elapsed since their appointment, they have been engaged in examining the present condition of affairs connected with the Park, in personal examination of the grounds, dwellings, and other structures situated within its limits, and in comparison of various plans and designs for its improvement.

As connected with the Park, and within the scope of the powers conferred upon them, the Commissioners have already taken action with respect to several important measures pressing upon their attention, one of which—that of the purchase of the State Arsenal grounds, situated within the Park—is now under the deliberation of your Honorable body; another of which—that of the new Reservoir, to cover about one hundred acres of the area of the Park—has been the subject of repeated interviews between the Croton Aqueduct Board and the Commissioners of the Central Park, with the common desire to continue, as far as practicable, in its plan, features that will be agreeable, and will conform to the character and effect of the new Park, at the same time that its efficiency for the primary objects of its construction shall in no respect be diminished.

Nearly four years have elapsed since the passage of the Act of the Legislature by which the grounds were authorized to be taken for this Park, and more than a year has passed away since these lands were actually taken for the public use, and provision made for the payment of them.

By the employment of the credit of the city, and by heavy assessments upon numerous adjacent and neighboring owners of property, these grounds have been secured to the city at a cost of more than \$5,000,000; and the people of the city are desirous of some indications of life and activity about this long-expected improvement.

As yet, only preliminary surveys have been made. While it is due, as a matter of justice, to a very numerous body of neighboring landholders, who have been heavily assessed for this improvement, that it should at once be entered upon; yet the primary objects for which the Park was established—the consideration of health and recreation for the great body of the people—present more imperative and urgent claims upon the Commissioners for the immediate fulfilment of the duties imposed upon them.

All the features that can be incorporated into this Park—the most extensive in the world—to afford healthful amusement, to cultivate taste, and to conserve the principles of a sound morality, will be inquired after and adopted.

With an area of 776 acres,  $2\frac{1}{2}$  miles in length, or as far as from the Battery to Union Square, and half a mile in width, or as far as

from the Battery to St. Paul's, being more than twice as large as Hyde Park in London—larger than Hyde Park and Kensington Gardens together—with a surface so diversified as to admit of great variety in effect—competent from its extent to allow a circuitous drive of twenty miles in length—this Park complete, with its drives, walks, lawns, its groves, its fountains, and statuary, will constitute an unsurpassed feature of attraction to this city ; and discarding in its arrangements all indications of exclusion or repulsion, aiming at a developement in accordance with the genius and spirit of popular institutions, this work will, at the same time, add the crowning feature to the attractions of this metropolis, and demonstrate that a people governing themselves not only admit of, but are satisfied with, nothing less than the highest expressions of art, as but developing the simplest and purest manifestations of nature.

To insure to the largest number the advantages of the Park, the Commissioners will see to it that in the regulations for its government, and in the efficiency of those to whom will be entrusted the execution of those regulations, the most complete guarantee shall be furnished for the preservation of order and propriety, so that children from their schools, invalid persons of both sexes and all ages, shall at all times feel that their resort to these grounds is attended with entire security and immunity from all that can demoralize or harm.

Bringing to this work, as some of the Commissioners do, valuable practical knowledge in the laying out and improvement of grounds, as well as experience in the administration of public affairs, and having spent much time in examining the grounds, and availing themselves of the best talent to be found in the country, the Commissioners are prepared to proceed at once with this great work entrusted to them, with views that will insure results likely to meet the public approval, both in the character of the improvements proposed and in the prudence of the expenditures necessary to attain these results, and with the intention to apply their means in such a manner as will at the earliest possible period render these grounds immediately accessible to those desiring to walk or drive therein, while the minor details of ornamentation are going on as time and opportunity offers.

The Commissioners of the Central Park respectfully request the Mayor, Aldermen, and Commonalty of the city of New York, in compliance with the Act entitled, "An Act for the Regulation and Government of the Central Park in the city of New York," passed April 17th, 1857, to create and issue a public fund or stock to be denominated "The Central Park Improvement Fund," and they hereby notify the said Mayor, Aldermen and Commonalty of the city of New York, that of such public fund or stock the said Board of Commissioners now require, for the purposes of said Act, subject to the limitations prescribed by the 8th section of said Act, the sum of \$50,000.

Very respectfully,

JOHN A. C. GRAY,  
Vice-President.

CHS. W. ELLIOTT, Secretary.

Dated New York, June 2d, 1857.

## Document No. 5.

---

BOARD OF COMMISSIONERS.

CENTRAL PARK.

---

TUESDAY, JULY 7th, 1857.

Mr. ELLIOTT, from the Committee on Roads and Walks, presented the following report, which was accepted, and the resolution adopted.

D. H. HART,  
*Clerk.*

The Committee on Roads and Walks, to whom, at the meeting of the Board of Commissioners of the Central Park on the 23d June, was referred a resolution respecting the removal of stone and stone walls lying in the Park grounds, beg leave to report:

That upon examination of the subject, they find a large quantity of surface stone, now lying on the grounds, which can be removed without blasting; also many old stone walls which must be removed.

That these stones must be removed at the earliest practicable moment, and before other work can be advantageously begun. That they may be advantageously used in building a foundation wall around the Park, upon which the permanent boundary fence can be erected.

They believe also, that this work may be done most easily and cheaply by contract, care being taken so to describe the stone to be removed, by stating all not embedded beyond a certain depth, or in some other way, as to avoid litigation.

Your Committee, therefore, offer for consideration the following resolution:—

*Resolved*, That the Chief Engineer be directed to mark out into five or more divisions the whole surface of the Park, preparatory to advertising for proposals for removing the stone walls and surface stone, and to report the same to this Board at the next meeting.

That he be requested to present in writing to this Board, at the same time, such a description of the stone to be removed as will be clear to contractors, and thus save future expense and trouble.

CHARLES W. ELLIOTT, } Committee on  
JAMES HOGG, } Roads and Walks.

Dated New York, June 29th, 1857.

## Document No. 6.

---

### BOARD OF COMMISSIONERS CENTRAL PARK.

---

**TUESDAY, SEPTEMBER 1, 1857.**

The Executive Committee presented a report defining the duties of the various officers of the commission, which was read by sections, amended and adopted.

D. H. HART,  
Clerk.

---

The undersigned a majority of the Executive committee to whom was referred a resolution of May 9th, 1857, as follows :

*“Resolved, That the Executive committee be requested to make a report to the commission, defining the duties of the employees of the commission.”*

Which resolution was renewed in substance at the last meeting, beg leave respectfully to report :

That they have given the subject attention during some time past, and have unanimously adopted the following system, for the government of the various employees of the commission in the prosecution of their respective duties.

1st. The *Chief Engineer* shall have the entire direction, responsibility and control of all the persons employed on the



Park, under the supervision and instruction of the Board. He shall execute such plans as may be decided on by the commissioners, and lay out and direct all operations, both preparatory and final, which the commissioners shall direct.

2d. The *Superintendent* during the progress of active operations, shall personally attend to the force employed on the park, to see that all give due attention to their duty, and report to the engineer any neglect or derilection therefrom which he may discover. He shall co-operate with the engineer in the execution of the details of the work which may be laid out, and when any portion of the plan or plans agreed upon shall have been carried out, to attend to its proper preservation and maintenance as completed. He shall also have charge of the general police of the park, to see that the ordinances of this Board are respected and obeyed. He shall report to the Board upon matters not pertaining to the construction of the work, monthly.

3d. The *Nursery man, and Superintendent of Planting*, shall consult freely with the engineer in regard to the most suitable places and most efficient method for the preparation of ground, and to recommend through him to the Board, such trees and shrubs as should be transplanted to the nurseries. He shall attend to the transplanting of the trees to and from the nurseries, and to such parts of the ground as shall be decided upon, and in every way in his power, aid in carrying out the expressed wishes of the commission.

4th. The *Construction and Disbursing Clerk*, shall be an assistant to the engineer to keep the time books, labor and construction accounts, to prepare the pay rolls, pay off the employees on the park, and keep the accounts of the engineer in the upper office.

He shall report weekly to the commission the particulars of his office.

He shall be assisted by a deputy clerk, who shall be a thorough book-keeper.

5th. The *Property Clerk*, shall keep an accurate account of

all tools and moveable property on the park, and charge all losses to the responsible parties.

6th. The *Clerk to the Commission*, shall have his office at the rooms of the Board. He shall have the entire charge and control of the books and papers in his office—subject to the Board, shall attend all meetings of the Board, and keep the minutes of the same, and also attend and keep the minutes of all the committees of the Board. He shall see that all notices of meetings &c., are duly served, all papers filed and preserved, and the duties in the office properly performed.

He shall be aided by an assistant, who shall be a thorough book-keeper, and shall keep the Treasurer's and Commission accounts, under the supervision of the Clerk to the Commission.

7th. Two *Deputy Superintendents* shall be appointed who shall act only under the direction and instruction of the Superintendent.

8th. The *Superintendent of Draining* shall search out such places on the grounds as require draining, and under the direction of the Chief Engineer, superintend the prosecution of the drainage work. His duty being in the field to overlook the same in person.

The committee would further report, that they can conceive of no duties specially appertaining to the office of *Chief Clerk*, which do not come within the sphere of the *Clerk to the Commission*, and they would therefore respectfully recommend an amendment to the bye-laws by erasing from the list of officers to be elected that of Chief Clerk.

All which is respectfully submitted.

J. F. BUTTERWORTH,

JNO. A. C. GRAY,

Majority of the Executive Committee.

Dated New York, September 1, 1857.

## DOCUMENT No. 7.

---

**TUESDAY, SEPTEMBER 1, 1857.**

The PRESIDENT laid before the Board a copy of the ordinance creating the Central Park Fund stock, passed by the Board of Aldermen, July 8th, by the Board of Councilmen, August 24th, and approved by the Mayor, August 25th.

It was referred to the Finance Committee.

D. H. HART, Clerk.

---

### AN ORDINANCE,

*To Create Funds for the Improvement of the Central Park.*

The Mayor, Aldermen and Commonalty of the city of New York, in Common Council convened, do ordain as follows :

§ 1. A public stock or fund, to be called "The Central Park Improvement Fund," shall be created for a loan of fifty thousand dollars, which shall bear an interest not exceeding seven per centum per annum, payable quarter-yearly, and shall be redeemable in thirty years from the issue thereof.

§ 2. The nominal amount or value of each share of the said stock shall be one hundred dollars, and the same shall consist of five hundred shares, or portions thereof may be of the nominal amount or value of five hundred or of one thousand dollars, and the number thereof shall be reduced accordingly.

§ 3. The said loan shall be receivable at any time within sixty days from the passage of this ordinance.

§ 4. The Comptroller is hereby authorized and directed to advertise for proposals to be received at any time within thirty

§ 4. The Comptroller is hereby authorized and directed to advertise for proposals to be received at any time within thirty days from the passage of this ordinance, and not to be opened until that day, for the said loan or for any portion thereof not less than the par value of one share of the said stock.

§ 5. The said Comptroller shall determine, on and after the expiration of said thirty days, which and what portions of said proposals shall be accepted, and shall issue certificates for the number of shares necessary to make up the said sum of fifty thousand dollars, to the person or persons, company or companies, whose proposals shall have been accepted, and each certificate shall be, or as nearly as may be, in the form of the certificates issued for the water stock of the city of New York.

§ 6. The comptroller shall receive all moneys payable for and upon said fund or stock, and shall deposit the same in accordance with the provisions of an act entitled "An Act for the Regulation and Government of the Central Park in the city of New York," passed April 17, 1857.

Adopted by the Board of Aldermen, July 8th, 1857.

Adopted by the Board of Councilmen, Aug. 24th, 1857.

Approved by the Mayor, Aug. 25th, 1857.

JNO. H. CHAMBERS.

Dep. Clerk C. C.

## Document No. 8.

---

**FRIDAY, SEPTEMBER 11, 1857.**

Mr. ELLIOTT, from the Special Committee on advertising, and preparing specifications for plans for laying out the Park, presented the following report :—

Mr. FIELDS moved that it be received, laid on the table, and printed. Carried.

D. H. HART,  
Clerk.

The Committee to whom was referred the matter of advertising for designs, beg leave to report the following form of advertizements for circulation :—

The Board of Commissioners of the Central Park offer the following sums for the four designs for laying out the grounds of the Central Park, which may be chosen by the Board :—

For the first, .....	\$2000
For the second, .....	1000
For the third, .....	750
For the fourth, .....	500

The designs chosen are to become the property of this Board.

The grounds for the Central Park are bounded by Fifty-ninth street on the south, and one hundred and sixth street on the north, by the Fifth avenue on the east, and the Eighth avenue on the west, forming a parallelogram of some 770 acres, of which about 150 acres are reserved for the Reservoirs for the Croton Water. The whole space is about  $2\frac{1}{2}$  miles long, and one-half a mile broad.

In the designs to be accepted, the following details should be provided for :

*First.*—Reference should be had to the whole amount of expenditure allowed by the Legislature, viz., about \$1,500,000.

*Second.*—Four or more crossings from east to west must be made between Fifty-ninth and one Hundred and Sixth streets.

*Third.*—A parade ground, of from twenty to forty acres, should be designated, with proper arrangements for the convenience for spectators.

*Fourth.*—Three playgrounds, of from three to ten acres each, should be designated.

*Fifth.*—A site for a future hall for exhibitions, concerts, &c., should be reserved :—

*Sixth.*—Also a site for one principal fountain and one prospect tower.

*Seventh.*—Grounds should be reserved for a flower garden of some two or three acres in extent, and a design be given for the same.

*Eighth.*—Space should be reserved for flowing with water to form a winter skating ground.

Designs offered should conform to the following scale, viz. : 100 feet to 1 inch, being 10 feet 2 inches in length, by 2 feet 3 inches in breadth.

Designs should be finished up with indian ink and sepia, not with colors.

Designs should be accompanied with a well digested written description, with a sealed envelope containing the designer's name.

Designs should be handed in before 1st day of 1858, to the rooms of the Board.

Topographical plans may be consulted at the rooms of the Board; and a list of buildings to be reserved obtained.

## DOCUMENT No. 9.

---

**WEDNESDAY, SEPTEMBER 23, 1857.**

The President presented a report from the Chief Engineer. On motion, it was referred to the Executive Committee and ordered to be printed.

D. H. HART,  
Clerk.

---

CENTRAL PARK,  
Office of the Chief Engineer, }  
Sept 23d, 1857.

The Chief Engineer begs leave to lay before the Board the following statement of the present state of the work on the Park, together with suggestions in regard to future operations.

In accordance with a resolution of the Board, passed July 28th, authorizing the Chief Engineer, under the direction of the Executive Committee, to proceed with certain operations preliminary to the improvement of the Park, the work was commenced on the 3d day of August. As many men have been employed as could be advantageously placed on the work. The force at the present time amounts to 697 persons, consisting of 448 laborers, 133 cartmen, 51 gardeners, 15 double-trucks, 26 foremen, 2 clerks, 2 draughtsmen, 1 blacksmith, and 1 messenger.

## PRESENT OPERATIONS.

1st. This force has been engaged in removing the stone walls and boulders scattered throughout the grounds to the exterior line and to such other places of deposit as they could be used to the greatest advantage.

2d. In clearing watercourses and drainage streams and removing obstructions to the flow of water from springs.

3d. Cutting down, removing and burning the useless growth and grubbing the useless roots from the ground.

Nearly all the interior inclosures have in this way been removed, as well as a large number of boulders. The lower half of the Park has been in a great measure cleared of briars and injurious growth. To a certain extent, the drainage streams have all been cleared out, and good progress has been made towards removing the deposits of stagnant water. The surface soil has been partially removed from the space lying between the site of the new receiving reservoir and the Eighth avenue, for the reason that the ground will shortly be covered with the materials excavated from the space to be occupied by the new reservoir, and the soil would consequently be lost; it was therefore deemed best to secure it at once.

With regard to the future progress of the work, the following suggestions are offered:—

### I.—CLEARING THE GROUND.

A large number of laborers could be advantageously employed in grubbing the ground. All of the old orchard and fruit trees should be removed at once.

### II.—ENCLOSING THE GROUND.

It is evident that so long as the park remains unenclosed, the present growth is liable to destruction from cattle, goats, swine, &c. In fact, a great amount of injury is now being done for want of an enclosure.

As far as the westerly line is concerned, it would seem that anything like even a temporary construction along the Eighth



avenue, would be useless, if possible, in the present condition of that avenue. If, therefore, the stone on that side of the park, of which there is a large quantity, were deposited in a continuous line, with some regard to regularity, it will answer the purpose of a regular wall until some further progress shall have been made in regulating the avenue.

On the easterly side we can act more advisedly. The Fifth avenue is now being graded, and as it will be necessary that the retaining walls along those portions of the avenue which are higher than the grounds of the Park, should be more permanent in their character than the retaining walls usually built by contract it will be necessary for the Commissioners of the Park to build these walls, which can be excluded from any contract for grading made by the city. These can be built at once, or at least a certain portion of them, and on them a more permanent enclosure can be constructed. The same will apply to Fifty-ninth street; while at 106th street, a temporary wall can be laid immediately on the present surface as it is not probable that it will be disturbed in some time.

### III.—DRAINAGE.

In all probability the present water courses and drainage streams will, with the aid of porous tile drains, carry off all the surface water and excess of moisture in the ground. The outlets to these streams will, however, require early attention. The flow of the water is impeded at Seventy-fourth street and Fifth avenue, in consequence of an obstruction having been placed in the drainage stream east of Fifth avenue, in order that the water may be used for private purposes. This causes the water to set back, and overflow a considerable portion of the ground within the Park. As this engenders disease, it should be abated at once by the City Inspector; and I would request authority to communicate with that person on the subject. There will be required at this point, both for the purposes of the Croton Aqueduct Board and for the necessities of property owners, as well as the necessities of the Park, a large sewer through Seventy-fourth street, and it is important that the matter should be brought to the attention of the city government, as the sewer will be required as soon as it is completed. At

Fifty-ninth street another obstruction to the free flow of the water from the Park is caused by the insufficiency of the culvert under the street. In order to remedy this, it will be necessary to drive a tunnel under the street, and to re-construct the culvert, or rather to build a proper one.

#### IV.—DEPOSITS OF VEGETABLE MATTER.

All the deposits of decomposed vegetable matter, wherever found, should be removed, for reasons too obvious to need explanation, and deposited in places convenient for being formed into compost.

#### V.—POROUS TILES.

In this connection it is recommended to purchase 100,000 porous tiles of different sizes for immediate use, as this is the best season for laying them, and a large portion of the ground which, when properly drained, can be prepared for grass, will be unfit for use until the tiles are laid.

#### VI.—STREET MANURE.

It is earnestly recommended that early steps be taken to secure the refuse matter derived from cleaning the streets, as the Park will require all of that kind of soil which can be obtained for the next five years. In addition to this some steps should be taken to obtain all the soil which is derived from excavating for buildings or other purposes in the immediate vicinity of the Park.

#### VII.—LEVELLING.

A sewer and distributing pipes run through that portion of the ground between the present receiving reservoir and the Fifth Avenue. This creates a long elevated ridge which cannot be removed, and whatever disposition is made of the ground on either side of this ridge, it must be brought to a level with it: this may be done at once.

#### VIII.—BUILDINGS ON THE PARK.

It is recommended that all the buildings on the Park, with

the following exceptions, be sold and removed as soon as possible:—

- ~~The Arsenal,~~
- The (Wagstaff House,) Office,
- The building occupied as a Station House,
- ~~The St. Vincent Academy,~~
- The building occupied by the late C. S. Bogardus,
- The building occupied by one Amery.

With these exceptions the buildings are unnecessary and in the way. Until the ground ceases to be occupied as residences it will not be a public Park. The residence on the ground of any employee can be of no service in its protection, while it may be a nuisance. Until the ground is all cleared and all enclosed we cannot tell what features to stamp upon it nor what to remove, nor can we keep it free from trespassers. In this connection it is urged upon the Board to adopt a set of ordinances for the government of the interior; and it is recommended that a pound be immediately constructed, into which all cattle, goats, swine and other animals found within the grounds be confined.

#### IX.—BARNs AND SHEDS.

It is recommended that all the barns and sheds not yet sold be torn down for use as old lumber in making temporary gates and fences.

#### X.—NURSERY TREES.

It is recommended that certain portions of the ground be immediately prepared for the purpose of transplanting this fall a large number of nursery trees, to be used as required in the improvement of the grounds.

Respectfully submitted,

EGBERT L. VIELE,  
Chief Engr.

## Document No. 10.

---

The President presented a report from the Superintendent of the Park in answer to resolutions of September 23d.

On motion, it was laid over and ordered to be printed.

D. H. HART, Clerk.

---

### TO THE BOARD OF COMMISSIONERS OF THE CENTRAL PARK:

Gentlemen,—By a resolution of the Board, communicated to me on the 24th of September, I am called upon to report to you “a comprehensive plan of draining for the Central Park, and at what time such work may be advantageously commenced.”

Owing to the exceedingly diversified character of the ground the great amount of rock, both above and below the surface, with which it is encumbered, and its numerous springs, hidden and superficial, a detailed plan of drainage for the Central Park could only be formed after such a careful study as a proper attention to the ordinary duties of my office forbids me at present to give to the subject. The depth and direction of the drains must be, in many cases, also, adjusted to the elevation of the brooks, cascades, and standing water, which will be established solely on artistic grounds, as well as to the roads which may be laid out. Until, therefore, a complete plan of the Park shall have been definitely determined on, I think it would be unwise to carry a consideration of the drainage-plan beyond the adoption of certain fundamental rules, to which even the landscape design should be subordinate.

Among the questions which may with advantage be immediately considered, the following occur to me:

*First.*—To what extent should the Park be drained?

*Second.*—By what form of drains?

*Third.*—At what depth?

*Fourth.*—Can the drainage be most economically executed by contract or by days work?

Construing the requisition of the Board, as asking my judgment upon these preliminary points, I reply to the first: That I consider it of the utmost importance that the drainage of the Park should be "thorough" in all its parts; that not a rood of the soil on which either grass, trees or shrubs are expected to flourish, should be exempt from the direct draught of a subterranean tube, rapidly conducting the superabundant water it collects to some lower point, and eventually beyond the limits of the Park.

The cost of such drainage will be great. \$30,000, in addition to the expense already incurred in indirect superficial drainage, would be a moderate estimate for it. I have been repeatedly asked, in a manner which indicated that the proposition would be generally considered preposterous, if I thought that the high table-land and the slopes beyond it, lying adjoining and south east of the reservoir, would be benefitted by artificial drainage, and I presume there will be a difference of opinion in the Commission, if not as to a certain degree of benefit to be derived from thorough-draining soil so situated, at least as to the economy of so great an expenditure as will be necessarily incurred to obtain it. Near the highest part of this elevated land are some large rocks, the earth around which had been excavated preparatory to their removal, about three weeks since. Some of the cavities thus formed remained open until last week, when I made an examination of the soil with reference to this question. Nearly two weeks had passed since rain had fallen, at which time the earth at the bottom of the holes was in the loose condition in which it had been left after the action of the pick and spade. Nevertheless, it was in every case moist and plastic. In some of the holes pools of water still stood, and it was evident that in no case had the rain-water to any considerable extent passed off by filtra-

tion. The earth taken from the bottom was in a condition resembling a stiff paste; that a little above it, from which the water had recently evaporated, was like half-dried putty; but still higher—above where the water had collected—in the perpendicular walls of the excavation, the earth, though composed, probably, of exactly similar particles, had a crumbling and porous appearance. It broke in flakes, and was pulverised under pressure; that below could only be removed in clots and lumps, and was tenacious under pressure.

This is simply an extreme exposition of the different character of the subsoil of the high land of the Park in a thoroughly drained, and in its ordinary undrained condition. In the one case it is easily penetrable by the roots of plants, and constantly ready to yield them the materials of their growth; in the other it is cold, inert, and not merely useless, but at all times and under every condition of the atmosphere, positively baneful to the health of the plants growing on the surface. When surcharged with moisture, it is tenacious, and holding water like putty, the soil above becomes a mere mire, suitable only to the growth of swamp-plants. During a season of hot drought, it hardens so that it can hardly be broken up by a pickaxe, and in this state it interposes a hydraulic floor between the thirsty roots in the surface soil, and the moisture which would otherwise be afforded them by capillary attraction from the cool earth below.

The action of under-drainage is primarily to remove superabundant water, but in the process of doing so it produces a mechanical change in the structure of the subsoil the value of which as affecting fertility is secondary only to its sanitary influence. This mechanical improvement is effected somewhat slowly in clay soils; it may be two years before it becomes of consequence, but when secured, it is more valuable than every thing that can possibly be effected without it, by surface tillage or even by the subsoil plow or spade trenching. I have no doubt that the thorough draining of the soil will eventually be considered essential to the beauty as well as to the salubrity, required in the Park, and if neglected at this period it will be secured hereafter, when, from the improvements which shall have been made on the surface, and the difficulty of connecting a complete system with such an arrangement as will otherwise be

adopted, its cost will be greatly increased. So essential to the Central Park, so fundamental in its construction, do I consider a perfect under drainage to be, that if an expenditure of all the funds under the control of the Board should be required to secure it, I should think it the duty of the Board to make this use of them, leaving, if necessary, those operations which can only be executed satisfactorily after such a preliminary operation, to a future generation. Nearly all the subsequent work contemplated, can not only be executed with much better results but also much more cheaply after the ground is completely, and at all points, freed from superabundant moisture.

A necessity of all modern gardening, there is abundant reason for asserting that thorough-drainage is a peculiar and special necessity for the site of the Central Park. It is believed that nearly one-seventh of the laborers employed upon it have been attacked with intermittent fever during the last fortnight. The cause of this is unquestionably to be found in the tenacious and unfiltrating condition of the soil, a condition which will be completely changed by thorough-drainage.\*

---

\* Doctor Charles Wilson thus describes the different sanitary condition of the vicinity of Kelso, Scotland, before and after the general adoption of a system of thorough-drainage on the farms of the vicinity.

"Ague then, as is well known to the older inhabitants of the district, was at one time, regularly endemic amongst us, affecting every year a varying but always a considerable portion of population, and occasionally in seasons of unusual coldness and moisture, spreading itself extensively as an endemic, and showing its ordinary tendency at such times of passing into a continued and more dangerous type. Ague was not usually in itself a disease of great fatality, the deaths recorded at the Dispensary having been only 1.81 per cent. of the cases treated. \* \* \* \* Still if we keep in view how frequently it was known to degenerate into fevers of a worse form and how often it terminated in jaundice, obstruction of the viscera of the abdomen, and consequent dropsies; or even if we take into consideration the frequency of its recurrence and the lengthened periods during which it racked its victims, we shall see much reason to be thankful that a plague so universal and so pernicious has been almost wholly rooted out from amongst us. Those who recollect what has been formerly stated of the swampy nature of the soil in our vicinity, and of the extensive means which have been adopted for its drainage, will, of course have no difficulty in understanding why ague was once so prevalent and under what agency it has disappeared, and will gratefully acknowledge the two-fold value of those improvements which have at once rendered our homes more salubrious and our fields more fruitful."

## II. The form of drains :

Experience proves that earthenware tubes of from one inch calibre upwards, according to their proximity to the surface, and of the parallels when laid, to one another, and in sections of from ten to fifteen inches in length, form the cheapest and most secure channels of drainage, and these, upon examination of evidence readily obtained, will undoubtedly be recommended by your Committee on the subject.\*

## III. The most desirable depth at which to lay these tubes :

When the modern system of thorough-drainage first came extensively in use, the depth generally adopted was three feet, and to this custom the Drainage Act of Great Britain, by which large sums were loaned by government to encourage an improvement which has since doubled the average product from agricultural labor in that kingdom, required all who took advantage of it, to conform. Subsequently, however, there arose a school of agriculturalists, at the head of which was Mr. Josiah Parkes, Consulting Engineer of the Royal Agricultural Society, who, on certain theoretical grounds, propounded the rule that drainage-tubes should never be laid at less a distance than four feet from the surface. Making this gentleman's acquaintance when I was in London, in 1851, he gave me letters to several superintendents of public parks and bailiffs of noblemens' estates, the drainage of which he had planned. In visiting them, I endeavored to ascertain more especially the effect of the system of deep drainage in a time of drought. For this purpose, I was fortunate in the opportunity of seeing several of them in an unprecedentedly dry season. I cannot say that the result equalled the expectations which in theorizing on the subject I had been led to form. Phoenix Park, a public pleasure ground of 400 acres, near Dublin, every part of which had been recent-

---

\* "The cheapness and durability of tile and pipe drains has so generally excluded the employment of all other descriptions, that it is almost unnecessary to notice any modern attempts to improve the efficiency of the olden systems."

Modern Agricultural Improvements, by Cuthbert W. Johnson, F. R. S., p. 35.



ly underlaid with tile, at a depth generally of five feet, was far from exhibiting the proverbially vivid verdure of the Emerald Isle, nor could I anywhere obtain conclusive statistics establishing any superiority for the system, in this respect, as I had hoped. Its advocates observed justly that this might be attributed to the recency with which the deep drains had everywhere been made, and the limited time they had had, in which to produce the thorough mechanical change in the soil, which was to be hoped from them. But the result of all my observations and enquiry at this time, and subsequently, obliges me to state that all theorizing aside, the weight of evidence from experience, seems to me yet to be in favor of more frequent and less deep drains for heavy clay lands, than have recently been advocated by many eminent agricultural authorities, both in England and our own country.

The possibility, however, of the roots of trees crowding a drain-tube out of place, or of their fibres entering the crevices between the sections and occupying the interior, is a conclusive reason, in my judgment, for adopting the rule with regard to all parts of the park, in which, according to the plan that shall be finally accepted, masses of trees are to stand, that no drain-pipes shall be laid nearer than four feet from the surface, except in certain exigencies of rock and surface-water, and then only after special consideration and approval by the Chief Engineer.

In all open grades, on the parade and play-grounds, and wherever there are no trees, roads, or other occasions for conducting the water at a greater depth, I should recommend tile-drains at a depth, so far as convenient, uniformly, of three feet, never less, and distance apart of fifteen. These propositions will be objected to by the partisans of different theories on widely different and inconsistent grounds, but where it cannot be afforded, or would not be right, to expend money looking to uncertain results, I believe the most general experience of practical men justifies them.

IV.—Preliminary to any work, a plan of drainage should be sketched without regard to hidden rock or the minor undulations of the surface. A careful subterranean survey by means of

sounding-rods, and occasionally by digging test-holes, should then be employed, to ascertain, as far as possible, the practicability of following the provisional lines of this sketch. A modified plan should then be drawn according to the data obtained by this subterranean survey. I have no question, however, that, as the trench-digging proceeded, it would still be found economical to depart very frequently from the lines of the last, or revised plan. Rocks would be encountered which had not been discovered in the survey and divisions between and depressions across rocks would be found which had not been suspected by the surveyor. To take proper advantage of these circumstances, the constant attendance of an intelligent and experienced person, who should be allowed discretion to vary from the plan as it should seem to him economy required, would be necessary. Very delicate questions as to how far a certain deviation from the plan, and consequent hazard of loss of the expected advantages from the work, would be justified by obstacles encountered, would momentarily arise. It is doubtful, for this reason, if it would be best to previously adopt explicit specifications for the drainage operations, and I think it can hardly ever be advisable to have any work extensively done by contract unless the specifications for it are very explicit and capable of being stringently enforced.

It is hardly possible to estimate the cost of the labor required for the drainage of the park with much justifiable confidence. Hence the chances are, either, that the contractor would find himself loosing money rapidly, and therefore, taking advantage of the necessarily loose specifications of the instrument of contract, would insist on doing his work very inefficiently, forcing the Commission to some compromise to his advantage, or, that he would be paid a sum much larger than it would cost the Commission to drain the park by days-work. Some parts of the work would require constant and vigilant inspection, by trustworthy officers of the Commission, to secure their safe execution under a contract; especially so, the laying of the tile and the filling immediately upon it. In one case under my observation, where this had been left to a contractor, the drains not working satisfactorily, an exploration was made and it was found that, during a temporary absence from the field of the

proprietor, tile had been thrown into the trench helter-skelter and hastily covered out of sight, thus wasting a large proportion of the expenditure for the whole work. A decision upon this question however, can be made much better after such preliminary action as I have suggested. The survey for the purpose, if I may be allowed to advise the Board, should be commenced immediately, before the ground is hardened by severe frost. Its result, to a certain extent, will be needed in order to form a well-digested plan for the next season's work on the park—not merely for the drainage but for any other work. It is possible that modifications of the landscape and road-designs for the park may be suggested by it.

It is not improbable also, that in the course of such a subterranean examination of the site for the park, a valuable deposit of clay, adapted for the tile making, may be discovered. In this case it might be best for the Commission to manufacture the tile required for the park upon the ground. It will otherwise probably be brought from Albany, and as it is a bulky article, the freight, and cartage expenses, will be a large item in the whole cost of drainage. I should roughly estimate it at \$5000. A drain-tile machine, to be worked by hand and capable of turning out 1000 feet of the smallest pipe per day, would not cost over \$75, and the necessary temporary sheds and kilns for the purpose would be inexpensive.\*

The first thing to be done in forming the principal drives of the park will be to construct deep road under-drains, one on each side, on their exterior lines. To obtain the effect of seclusion and to avoid as far as practicable an outlook from them upon the high-graded streets which will surround the park, these drives will probably be laid out as low as shall be found convenient. Their concurrent drains will therefore be below the general depth of the park drainage and will readily become in many cases the leading or main drains for it. Until, there-

---

\* Even if clay of the proper sort should not be found on the park, it is worthy of a more careful calculation than I can at present make, to ascertain if it would not still be best to manufacture the tile, bringing the clay from some point from which it could be chiefly transported to the park by railroad.

fore, the design by which the course of these drives will be designated, is finally adopted, I trust the Board will agree with me that it is impracticable to extend a plan of drainage for the park, beyond the few important preliminary points, my views upon which I have now submitted.

I have the honor to be,

Gentlemen,

Your very obedient servant,

FRED. LAW OLMSTED,  
Superintendent.

New York, October 6, 1857.

## DOCUMENT No. 11.

---

**OCTOBER 20, 1857.**

A report from the Superintendent relative to trees, in answer to a resolution of September 23d, was read, and referred to the Committee on Trees and Plants. October 27th, Mr. Green moved that the report of the Superintendent, received and read at the last meeting, be printed. Carried.

D. H. HART,  
Clerk.

---

NEW YORK, October 16th, 1857.

A resolution of the Board of 23d September demands my judgment as to the advisability of importing, or otherwise obtaining, trees this season, and a communication subsequently received from the Committee on Trees, enlarges the scope of the inquiry.

It is impossible to form an estimate which will have any value, of the numbers of the different sorts of trees which will be wanted for the Park, until the plan is finally determined on. But it may be supposed that in the greater part of the Park the natural characteristics of the ground will be accepted and turned to account; and an opinion may be expressed as to the style of planting which would best comport with these characteristics, and of the sorts of trees which this style will require. It will probably best meet the purpose had in view by the board in calling upon me for a report on the subject, if

I state the conclusions to which I should myself thus arrive, and indicate the number of the different sorts of trees which would seem to me to be indispensable, at the very outset of the planting.

In the rugged portion, comprising nearly three-fourths of the surface of the first section, the stiffer forms of evergreen trees will best accord with, and set off, the picturesque rocks which are the marked feature of the landscape. The Hemlock and Black Spruce will probably be preferred as the predominating trees, wherever it is practicable to supply and retain the deep, loose, rich, black soil which they require; and on the steeper slopes and higher ground the Norway Spruce. On portions of thin soil, over, and in the clefts of, masses of rock, the European Larch, Scotch Fir and American Arbor-vitæ, and in the more sheltered low-ground, especially if a portion of this is occupied by a pond, as proposed by the chief-engineer, the Deciduous Cypress, the White Cedar or swamp Arbor-vitæ and the Red and Black American Larch or Hackmatack would both harmonize with the scenery and be most sure to flourish. Most of these trees will be wanted in large quantity elsewhere in the Park, but here they are likely to be employed as the groundwork of the planting, various other trees being used, each in smaller numbers, to heighten local effects.

On many accounts it will be found best to plant this part of the Park earliest; and as it will be an advantage to have had the trees in a nursery near at hand, for at least a year before setting them in the position they are intended to occupy permanently, I think it would be safe to obtain for the purpose, as soon as may be found convenient, at least 3,000 Norway Spruce, 3,000 Hemlock, 500 Black Spruce, 500 Larch, 500 Arbor-vitæ and 150 of each of the others I have mentioned.

In the transition from this rugged ground to the table-land of the second section, the softer evergreens will be appropriately used and 300 of the White Pine and 150 each of the Scotch, Corsican, Pinaster and *Cembra* Pines may be safely purchased at once.

Nearly a third of the second and third sections is now occupied by a young grove of Deciduous trees, and no large number of any

particular sort will be needed to be introduced among these. The artificial style will probably be adopted, or at least approached, as indicated on the plan of the Chief Engineer, in the eastern parts of these sections, for which choice lawn and avenue trees will be wanted, and in the western part, evergreens of the sorts suggested for the first section will be most appropriate. European Larch, *Arbor-vitæ* of different varieties, the Silver Fir and others of the smaller Fir, will best grow on the rocky terrace west of the reservoir. The park soil seems particularly obnoxious to the Balsam Fir, not one of twenty specimens growing upon it being in sound condition.

In the fourth section there is again much fine young wood of the native deciduous species admirably grouped by nature. The largest and finest trees of our climate can, however, be employed here in great numbers—Hickories, Oaks, Elms, Beeches, Chestnuts, Ashes and Maples especially. The same trees will be wanted also for groups and detached planting on the lawn-like ground which will probably be made on the gentle slopes and level portions of the second and third sections. Those varieties of these species, therefore, which are most uniformly healthy, simple in outline, and dense and retentive of foliage, may be safely obtained in large quantities. I should think that at least 1000 of each would be needed next autumn.

At the first planting season after any portion of the drives or footpaths are laid out, such shrubs as the following (the Superintendent of Planting would doubtless add largely to the list) will be wanted in large quantity. Several thousand of each may be procured at once with unquestionable advantage: Honeysuckle, *Kalmia Latifolia* (the Laurel of New England), Dogwood, Privet, Hawthorn, Buckthorn, Osage Orange, *Magnolia Glauca*, *Obovata*, *Conspicua*, and all the varieties which are certainly hardy and healthy in the climate; Lilacs, Dwarf Horse-chestnut, Missouri Currant, Virginia Fringe, *Spiræa*, *Syringa*, *Hydrangea-quercifolia*, *Viburnum*, *Althea*, *Acacias*, Indigo-bush, *Dentzia Scabra*, *Weigela Rosea*, Japan Quince, *Daphne Mezereum*, Burning-bush, *Laburnum*, and every smooth-leaved evergreen that will surely endure the climate.

I have confined myself to an enumeration of trees, which, in my judgment, will be indispensable to at least the numbers giv-

en, merely as a basis of the landscape planting; which will, therefore, be the first required for use, and which it will be an important advantage to the landscape-gardener to have growing in a nursery on the park. If there is yet time for the preparation of the ground, and for proper painstaking in their selection, I should strongly recommend them to be procured this season, and at all events I should advise that ground be drained, fertilized and trenched, in order to receive them early in the spring. Besides getting those I have mentioned, it would be well to select immediately the finest trees which can be found, at a moderate price, in any nurseries which can conveniently be visited for the purpose, to the number of at least 1000 Mountain Ash; 1000 Dogwood; 1000 Sweet Gum; 1000 Horse-chestnut; 500 Linden; 200 Silver Poplar; 200 Weeping Willow; 200 Button-Wood; 100 Lombardy poplar.

The Committee on Trees desire me to state what my experience has been in the importation of trees. It has not been extensive: I have imported a few lawn and forest trees, perhaps ten thousand seedlings and small evergreens, and six thousand deciduous trees, mostly fruit trees, from four to ten feet in height. The latter were packed in bales, with dry moss, and came by sailing vessels; the evergreens and choicer trees in cases, and mostly by steamer. The only losses of consequence were in one or two cases of seedling-evergreens coming by sailing vessels. Otherwise, the damage the trees suffered on the way was less than usually occurs with those coming from our own nurseries—less care being here taken in packing than is customary, at least in packing for exportation, in Europe. The whole number of trees seriously injured, from all causes connected with transportation, has not in my experience, exceeded five per cent. of all I have imported. This is very much less than the usual estimate; but it is my impression that the heavy losses often reported, are in consequence of want of forethought in making the arrangements, or perhaps of an ill-directed economy. I suspect also that some of our nurserymen are inclined, from interested motives, to exaggerate their own losses by sea. Mr. George G. Sheppard is employed as broker by many of the largest American nurserymen, and sometimes, I believe, as a factor, by the European nurserymen.



His importation of seedlings and larger trees, amounted, last spring, to over 1000 packages, containing more than a million young trees; and he states that to the best of his knowledge the loss in transportation did not exceed 2 per centum.

On trees 3 to 5 feet in length, the total ordinary expenses of importation, including all items, from the European inland nursery to delivery anywhere in New York, I have found to be, by sailing vessels, from 3 to 6 cents a tree, by steamer 5 to 10 cents.

I have compiled and will attach hereto a schedule of the catalogue prices for a considerable variety of trees and shrubs, of large commercial nurserymen, respectively, in France, England, Scotland and the United States. The customary discount to wholesale purchasers is, I think, generally larger in America than Europe. As many of our nurserymen are very intelligent and well-informed persons, and employ a large capital, it must be taken for granted that competition among themselves will have fixed the price of such trees as it is worth while for them to import at all, not excessively above the average cost of importation, all things considered. It must be an accidental and temporary exception if trees, which are ordinarily in much demand here, can be imported by those not regularly engaged in the business much below what they are sold for at our nurseries. The nursery business, however, I have found peculiarly irregular, and if one is to plant largely of any special tree, it is always worth while to make extended enquiry for it. The reason is, that the period of their growth in which trees are readily saleable is limited; so that they may be considered somewhat as a perishable commodity. Local demands are capricious, also, and a nurseryman is thus often threatened with a dead stock of a few particular sorts which therefore he will dispose of at less than ordinary rates. Again, a large demand of a peculiarly local character for certain sorts of trees stimulates a much more wholesale propagation of them; and, if this demand is continuous, the local nurseries will surely be able to supply these particular sorts at less prices than they can be sold at elsewhere. In the peach-growing districts of New Jersey, for instance, peach trees, such as are ordinarily sold by nurserymen elsewhere at \$20 a hundred, are supplied at \$6. In Eng-

land, where the demand for peach trees must be extremely limited, they would be found in any quantity at but few nurseries, and (at Sawbridgeworth) the catalogue price is 3s. 6d. sterling each, or more than twelve times what it is in New Jersey. The Osage Orange, being extensively required as a prairie hedge-plant, is sold at half the price in Illinois that it is in this vicinity. The Larch, which is purchased by the million for plantations on highland estates, is supplied in Scotland at 3s. 6d. a thousand. The lowest price in the United States is \$40 a thousand.

It will probably be found that the trees which are ordinarily used in the United States as shade and road trees, and which consequently are imported, or propagated, extensively by our nurserymen, can be obtained from the American nurseries better than from the foreign. These are the trees which will be wanted in largest quantity, and which it will be most important to get of good size, well furnished, and in healthy, thrifty condition.

On an examination of the stock of our large nurseries it will be found that each has an advantage in certain particulars and by making a selection from each, of the best, a fine collection can be much better obtained than by contracting with any one or two for the assortment required. The most healthy and well formed trees, should be selected, with in general, but little regard for size, and the Superintendent of Planting, or some person or persons instructed by him, should oversee the taking up and packing of the trees as well as their reception and replanting. The season for transplanting is short, nurserymen are therefore driven with business, and often obliged to employ careless and reckless persons. Trees are in consequence, frequently, and, I may say, in my own experience, generally, seriously damaged in value, in the process of taking up and removal.

A considerable importation of evergreens will probably be found unavoidable. Our nurseries have extremely small stocks of a very great variety of evergreens, which some of the European nurseries keep on hand in much larger quantity, because they are required on precisely such occasions as this, in the planting of a park or garden of the first class, an undertak-

ing much more common there than here, as well as by a class of wealthy amateurs, not yet found in the United States, who form collections of evergreens, or winter-gardens in their private grounds. The greatest number of varieties of evergreen trees and shrubs to be found in the catalogue of any nurseyman in the United States does not, I believe, exceed eighty—some of the foreign nurseries have eight hundred.

For similar reasons, European nurserymen propagate a better assortment of varieties of deciduous trees than ours. The following, for instance, are the largest numbers of varieties of the species named, which I find in the American and in the European catalogues:—

Maple,	American, 12	European 36
Birch,	“ 2	“ 13
Elm,	“ 19	“ 35
Ash,	“ 24	“ 36
Beech,	“ 7	“ 18
Oak,	“ 20	“ 71
Hornbeam,	“ 2	“ 8
Willow,	“ 16	“ 28
Magnolia,	“ 13	“ 38
Hickory,	“ 3	“ 13
Poplar,	“ 9	“ 28
Locust	“ 2	“ 9

It may be true that many of the varieties named in the European catalogues have no especially valuable qualities and that many of them are unsuited to our climate (though in most cases, this remains to be tested), but it is also true that with the addition of those which cannot be got here, the gardening artist has it in his power to produce landscape effects with a degree of precision and delicacy which without them it would be hopeless for him to attempt.

An extended list therefore can be made of both deciduous and evergreen trees of this class, of which a number—say from ten to one hundred of each—must almost necessarily be obtained from Europe, and as many of them can only be got of small size; and as it is, especially with evergreens, very much safer and

every way cheaper to import trees of small size, it is desirable that such order should be given at the earliest moment after the list could be prepared, so that the trees may be had for planting in the Park nursery next spring; by the following spring most of them would probably be wanted for permanent planting.

I am, gentlemen, very respectfully,

Your obedient servant,

FRED. LAW OLMTED, Supt.

To the Board of Commissioners  
of the Central Park.

### SCHEDULE OF CATALOGUE PRICES

*For certain Trees at the Principal Nurseries in the United States, France, England and Scotland.*

#### DECIDUOUS TREES.

	U. S.	France.	England.	Scotland
Maple.....	50	20	38	38
“ per 100.....	\$25 00	..	..	..
“ Norway, per 1000.....	..	..	..	\$9 00
Horse-chestnut.....	50	15	..	38
“ per 100 (small).....	8 00	..	..	..
Birch.....	50	12	38	13
Chestnut.....	50	25	..	25
Hornbeam, American.....	50	18	..	16
“ “ per 1000.....	..	..	..	\$5 00
Hawthorn.....	50	15	38	16
“ per 1000.....	..	..	..	\$2 25
Beech.....	50	20	38	25
“ purple-leaved.....	1 00	20	38	38
“ weeping.....	1 00	15	63	63
Ash.....	50	15	38	25
“ weeping.....	1 00	15	50	38
Hickory.....	50	20	..	..
Magnolia, acuminate.....	50	40	25	38
“ “ per 1000.....	50 00	..	..	..
“ purpurea.....	75	25	38	38
“ glauca.....	50	50	..	63

	U. S. France. England. Scotland.		
Tulip Tree.....	50	20	25 18
Poplar, white.....	50	12	38 12
“ weeping.....	..	25	62 ..
Oak, Am. white.....	50	20	38 25
“ English.....	50	18	25 25
“ overcup.....	50	20	.. 25
“ per 100.....	..	..	.. \$9 00
Willow, white.....	50	12	.. ..
“ “ per 1000.....	..	..	.. \$9 00
“ weeping.....	50	15	38 25
“ basket.....	25	10	.. ..
Elm, American.....	50	18	.. ..
“ weeping.....	1 00	18	50 18
“ English.....	50	18	.. 6

## SHRUBS.

Honeysuckle.....	38	10	12 25
“ per 100.....	\$12 00	..	.. ..
Japan Quince.....	50	15	.. 6
Dogwood.....	35	10	.. 12
“ per 100.....	..	..	.. \$3 55
Deutzia.....	25	10	25 6
“ per 100.....	\$12 00	..	.. ..
Lilac.....	25	10	25 25
“ per 100.....	\$15 00	..	.. \$2 00
Weigela.....	30	15	25 ..
“ per 100.....	\$10 00	..	.. ..
Azaleas.....	50	18	.. 25
“ per 100.....	..	..	.. \$3 25
Privet.....	25	10	12 25
“ per 100.....	\$18 00	..	.. \$2 01

## EVERGREENS.

Arbor Vitæ, American.....	50	15	12 12
Seedlings transplanted, per 100...	\$40 00	\$8 00	.. \$8 00
Norway Spruce.....	50	15	25 6
“ Transplanted } Seedlings } per 100.	\$15 00	\$4 00	.. \$2 38
“ Two feet high, per 100	..	..	.. \$3 88

	U. S.	France.	England.	Scotland.
Hemlock.....	75	25	13	25
Pine, American White.....	75	15	13	10
“ per 1000, Seedlings.....	..	\$4 00	..	\$5 00
“ “ “ 2 feet high, do....	..	..	..	\$10 00
“ Excelsa .....	\$2 00	15	25	12
“ Seedlings trans- } planted, } per 1000..	..	..	..	\$6 00
Pine, Austrian .....	..	18	12	25
“ per 1000, Seedlings .....	..	\$6 00	..	\$7 50
Cedar, of Lebanon.....	\$2 00	30	25	\$1 25
“ Deodora .....	\$2 00	40	25	63
“ African.....	..	50	38	\$1 25
Cypress, Horizontal.....	\$1 00	18	38	25
“ Pyramidal.....	\$1 00	18	38	22
“ California.....	\$2 00	75	62	62
“ Deciduous.....	..	25	25	62
Kalmia Latifolia.....	75	20	38	25
Yew, English, per 100.....	\$18 00	..	..	\$3 13

## Document No. 12.

---

**OCTOBER 30th, 1857.**

The Committee on Draining and Sewerage presented a report, accompanied by a report from the Superintendent of Draining. On motion, it was laid over and ordered to be printed.

D. H. HART,  
Clerk.

---

### *To the Board of Commissioners of the Central Park:*

Gentlemen,—The Committee upon Draining beg leave to submit a brief report for the consideration of the Commission.

The Commission have before them the report of the Superintendent of the Park upon the subject, which recommends:

1. Thorough draining of every portion of the Park, with drains sunk 3 feet and 15 feet apart.
2. The doing of the work by day's work, rather than by contract:
3. The possible manufacture of the tile on the grounds:
4. The examination of the surface, and the drawing up of a plan for laying out the drains.

A report from the Superintendent of Draining is herewith submitted, which recommends:

1. Thorough draining of every portion of the Park—in order to provide for “the sanitary requirements of the Park,” the

"fertility of its soil," and "the disposition of the water as an element of beauty":

2. The construction of two proper and sufficient sewers or culverts at Fifty-ninth street, near Fifth avenue, and near Seventy-fourth street and Fifth avenue, to carry off surplus water:

3. That the opening of the ditches and filling in of two-thirds of them be done by contract; and that the laying the tile and covering of the first one-third be done by day's work:

4. The purchase and delivery of one cargo of tile this fall, preparatory to the opening of spring work:

5. The preparation of a plan for thorough drainage, to be made at once.

The Commission are aware of the fact that "thorough draining," as it is called, is of very recent adoption, having been extensively practised in England but little more than ten years; in this time, however, it has met with such favor as to be encouraged by grants of money from Government, and by an outlay on the part of many landowners of an average of from twenty to thirty dollars per acre. Magical effects, almost, are claimed as the result, both to the fertility of the lands and the health of the districts. A recent and very intelligent French agriculturist, De Lavergne, after an examination in England, says:

"Both meadow and arable lands are equally benefitted by it. In the meadows, marsh plants disappear; the hay produced is at once more abundant and of better quality. On the arable lands, even the most clayey, corn and roots shoot more vigorously, and are healthier, and less seed is required for a larger crop. The climate itself gains sensibly by it; the health of the inhabitants is improved; and in all parts where drainage has been vigorously carried out, the mists of the foggy isle seem less thick and heavy."

In an elaborate article, prepared by Dr. Wilson, upon the sanitary condition of the district of Kelso (which is printed in the 12th volume of the Quarterly Journal of Agriculture), comparing the statistics of ten years (from 1830 to 1840) with ten



years of the last century, he states that the decrease of endemic and epidemic diseases was as 14.35 to 33.07—more than one-half; which he attributes in a great degree to draining of various kinds.

Another fact is worthy of notice, viz., that from drained lands the evaporation is considerably less than from land saturated with water. The experiments of Mr. Charles Charnock, of Yorkshire, for a period of five years, seem to show a difference in evaporation of  $19\frac{1}{2}$  inches from drained land, to  $32\frac{1}{2}$  inches from saturated.—(Dempsey's Treatise.) This, of course, is not conclusive, and does not apply to this country.

We are to bear in mind, that in England where "thorough drainage" has become a fashion, and where large tracts have undoubtedly been redeemed by it, much of the land partakes of the nature of a stiff clay, and that the climate compared with ours is decidedly humid; while the average fall of rain in our State (about 35 inches) does not materially differ from the mean of England, yet there it falls more slowly and evenly, and is less likely to run away from the surface than with us. While we, therefore, may wisely doubt all the benefits claimed by the strong advocates for "thorough drainage" in England, and also that what is unquestionably beneficial there may easily be applied in excess here, still there is abundant evidence showing its advantages in districts infested with fever and ague; and also, that, if wisely used, it aids in securing fertility.

In this country not much has been done in the thorough drainage of lands, and of that little we have no reliable statistics. Mr. John Johnson, of Geneva, seems to have applied it indefatigably through a long period, and as he is a farmer, and still advocates it as an economic question, his evidence is good.—(Country Gentleman, 1855.) He states that drain tiles raised after lying for 18 years were perfectly sound.

Laying aside minor points for the present, the question at once to decide is—Shall we apply "thorough drainage" to the grounds of the Central Park at all? And if so, to what extent?

From the evidence offered us, the subsoil seems to be clay and retentive of moisture; the surface of the Park also is broken, and there must be some bowls and pockets where

water will stagnate below the surface. There is also no question that the district so largely occupied by the Park grounds, is subject to fever and ague.

These facts seem to warrant the Commission in applying "thorough drainage" to such an extent as to secure, if possible, the health of the district. This leads to the second question—To what extent?

Your Superintendent advises drains 3 feet deep and 15 feet apart, which will require, in round numbers, for the whole surface of the Park, 100,000 rods of drains. Thorough drains have been laid at various distances, from 10 feet to 66 feet apart in England, and there are advocates for frequent and shallow drains, as well as for wider distances and deeper laid; and the question does not seem at all settled there. The more common practise is 24 feet apart, and from 3 to 4 feet deep, and there is positive testimony that upland grass has been injured by too much drainage. Considering, therefore, the difference of opinion among those who have practised "thorough drainage," and the difference of climate between England and New York, it is safe to assume that one-half of the amount of drainage will accomplish the purpose wished for here: if, therefore, 24 feet is a common distance for drains there, it is probable that from 40 to 50 feet apart will answer here. The resolution accompanying this report will bring this question before the Board for decision.

Upon inquiry in various quarters it is found that tile drains laid three feet deep will cost from 55 to 80 cents per rod complete; these being the extreme offers made the Committee. If drains are laid 50 feet apart over the whole park about 30,000 rods will be required, which at a cost of 75 cents per rod will amount to 22,500 dollars. Something may be saved from this by excepting uplands, or in other ways. Some other points require brief attention at this time. The Superintendent of Draining (in his report accompanying this) advises the construction of two sewers or culverts at 39th and 74th streets, to carry off the water of streams. The Committee on Drainage had an interview with the Water Commissioners, and were informed that the sewers building or to be built will be ample for all purposes, and would be at our disposal. It may be best, therefore,

to postpone the above work till those sewers are completed. The Superintendent of Draining also recommends the purchase of one cargo of tile preparatory to spring work, which the state of our finances will probably forbid. The Superintendent of the Park in his report suggests the propriety of manufacturing our tile on the ground, which practically will be found both tedious and expensive. He also recommends that the whole of the work of digging, laying and covering be done by day's work; the Superintendent of Draining recommends the opening of the ditches and covering of two-thirds to be done by contract, the laying and covering of the first one-third by days' work. It is probable, that the opening of the trenches can be done cheaper and as well by contract, while the laying and filling in will be best done by days' work: a few days of experience will settle the matter. Both Superintendents concur in the importance of having an immediate survey made, and a plan of drainage mapped out for next season's operations. There is no question that this should be done at once, to the extent which may be agreed upon by this Board. With these suggestions and the accompanying resolution, the whole matter is respectfully submitted.

CHARLES W. ELLIOTT,  
JAMES HOGG.

New York, Oct. 21st, 1857.

*Resolved*, That the Chief Engineer be directed to furnish the Superintendent of Draining, with necessary instruments and assistants (not exceeding five men.) for his work.

And that the Superintendent of Draining be directed to commence at once an examination of the grounds, and to proceed as rapidly as possible to make working maps, of drains proper to be laid to secure the healthfulness of the Park; it being understood that wherever practicable 2 inch drain tile are to be laid (with larger mains) from 3 to 4 feet deep, and from 40 to 50 feet apart, and that uplands clearly self-drained are to be excepted; that he make brief weekly reports of the progress of his work to this Board.

Also, that the Committee on Buildings be requested to place suitable rooms on the Park at his disposal.

*To the Committee on Draining and Sewerage of the Board of Commissioners of the Central Park :*

Gentlemen,—The undersigned, Superintendent of Draining of the Central Park, had received from one of your number, and in your name, a communication asking for information on the following points :

I. As to what extent thorough drainage can be profitably applied to the Central Park.

II. As to what can be advantageously done this fall and winter.

III. As to what can best be done by contract, and what by day's work.

IV. As to what the probable cost of laying 2-inch tile, 3 feet deep will be ; 3-inch tile 4 feet deep.

V. Any further information that it may be deemed best to lay before the Board.

I. Without entering, at present, into the *rationale* of the subject, it may be stated that thorough drainage is required on nearly if not quite all of the lands of the Central Park, for the reason that the soil, which is mainly of the same character, is such as does not allow the free percolation of water to such a depth as will answer the ends of the best cultivation.

In considering this question, there are three important points to be borne in mind, *i. e.*, in effecting the removal of the surplus water of the soil, the aim must be to produce the best results with reference to (a) the sanitary requirements of the Park, (b) the fertility of its soil, and (c) the disposition of the water as an element of beauty.

*α.* The Central Park being intended to serve as an important agent in maintaining a physically healthy condition of the people of the city, the sanitary consideration is, of course, of the first consequence. The wholesomeness of the atmosphere of the Central Park will depend chiefly on the condition of decomposition of the organic matter contained in its soil.

The normal decomposition of such matter is arrested by the presence of undue moisture, and is replaced by a fermentation or putrefaction which produces gases—such as carburetted, sulphuretted and phosphuretted hydrogen—that are detrimental to health. If the surplus water be removed from such soils the decomposition assumes a healthy character, and the material on which it acts is resolved mainly into gases which are, not only not injurious, but are wholesome and necessary ingredients of the atmosphere.

The difference is the same, though in a less noticeable degree, as that existing between putrefaction and combustion. The one produces the most foul and dangerous form of gaseous matter, while the other simply restores to the atmosphere, in an innoxious form, the elements which it had lent to organic growth, and which are needed to maintain its power of supporting animal and vegetable life.

The surface of the Central Park is almost without exception, —unless where affected by artificial drainage—saturated with water during most of the year. Its soil also contains organic matter, in the form of roots, dead insects, &c., which must be decomposed by one process or another. The presence of too great quantities of water, preventing that healthy form of decomposition which is to be desired, there ensues a form which produces results more or less injurious in proportion to its activity.

Were the water withdrawn from the soil to such an extent as would allow sufficient circulation of air among its particles, the evil effects of decay would be obviated, and that which is now so undesirable would become a most active agent in maintaining a condition of health.

Thorough drainage is absolutely essential to nearly the whole of the Central Park to effect the change of condition described above.

b. The condition of the soil as to its *fertility*, is one, the consideration of which need not be detailed.

Great and lasting fertility can be attained only after applying to the lands of the Park such a system of drainage as will completely remove their present condition of saturation; that is, by laying, under ground, tile or other material, in such a manner as to carry off all of the water which would not naturally adhere to the particles of soil.

The condition of the soil should be such, that when a heavy rain falls, it may be at once absorbed, and not excluded by water already existing in the ground, and thereby caused to flow off over the surface, carrying away the more fertile parts of the soil, and failing to yield to it the fertilizing gases which it had obtained from the atmosphere.

When such a system of drainage shall be established, the following effects will result:

There will ordinarily be, from the porous condition of the soil, such a circulation of air among its particles as will cause an increase of fertility, and, whenever the soil shall be saturated by the water of rains, the air will be entirely removed, and fresh quantities will enter on the subsidence of the water.

The effect of drought will be, in a great measure, obviated by the deposit, by condensation, on the cooler particles of the soil, of the watery vapor contained in the air entering the soil.

This effect of drainage is important, and is much greater than would be supposed.

The soil will be much warmer, and, as a consequence, lawns will assume a green appearance earlier in the spring, and retain it longer in the fall than on land not so treated.

Grasses will retain their vigor for a much longer time, and trees will not only grow more rapidly and healthfully, but they will also have more force to resist the effect of casualties.

These are some of the more important reasons why the drainage of the Park is essential to its fertility. There are still others, which it is not necessary to give at this time.

c. The disposition of the water of the Park, as an element of beauty, has a bearing on the value of its drainage—which may be considered in this connection as a *manufacture of springs*.

By a judicious disposition of tile drains, the immense amount of water which is now evaporated during summer, from the surface of the soil, may be, mainly, conducted to the streams and ponds, and may obviate, in a great measure, the necessity of drawing on the Croton for a supply.

It may be stated, as a moderate estimate, that there are, at times, more than 500,000 gallons of water evaporated from the surface of the Central Park during a single day. One-half of this amount slowly supplied to the streams, as it would be by a proper system of under-drains, in the form of purely filtered water, would be a most valuable addition to the present resources of the Park.

II. Concerning the work to be done during the present fall and winter, the best course would seem to be to continue the present operations for the removal of surface water until the beds of all swamps and ponds are exposed to the action of the atmosphere.

It is now too late to do much at the final thorough drainage, even if it were best to do so at this early stage of the work. The absence of a plan showing the future surface of the Park, and the disposition that is to be made of the water, is another insurmountable objection to the laying of tile this fall.

There are two streams—one passing beyond the limits of the Park at Fifty-ninth street, near the Fifth avenue, and the other at Fifth avenue, at or near Seventy-fourth street—the outlets of which are not sufficient for the purposes of complete drainage. These may with advantage be secured at once by the construction of proper mason work culverts, or sewers, plans and specifications for which I shall be prepared to furnish to the Committee when necessary. The mere opening of old water-courses—the only work in my department thus far authorized by the Board—is now nearly completed, and no other work can, in my judgment, be undertaken until the frost leaves the ground in the spring, except upon the culverts referred to, and the surface drainage of two or three swamps and ponds, by courses thus far unauthorized by the Board.

III. As to what part of the drainage operations can best be done by contract, and what by days' work, I should advise that—

The construction of the culverts, and sewers required for the outlets of the two streams previously mentioned;

The opening of the ditches; and

The filling of the last two-thirds of the depth, after laying and covering the tile be done by contract.

The following work should be done by days' work, and in the most careful manner:

The finishing of the trenches;

The laying of the tile; and

The filling of the first one-third portion of the trenches.

IV. Concerning the cost of laying the tile, I would suggest that the depth need have no reference to the size of the tile. It is often advisable to lay 2-inch tile to a greater depth than that named in the query, while, under certain circumstances, larger tile are required at a less depth than four feet.

At the prices charged at the Albany Tile Works, 2-inch tile (\$12 per M, or say \$15 on the ground) will cost about 22c. per rod; 3-inch tile (\$18 per M, or say \$25 on the ground) will cost about 36c. per rod.

The digging of the trenches may be done more cheaply than it has as yet been performed in this country. I have, during the present summer drained a tract of land in New Jersey, on the line of the Morris and Essex R.R., in which case I laid 2-in. and 3-in. tile to a depth of four feet. The soil was very much the same, as regards ease of digging, as that of the Central Park, and the charge for digging the trenches, and for refilling the last two-thirds of the depth was 50c. per rod—the hands who did the work earning \$1 50 per diem. The trenches in question were dug with the ordinary spade, and cost more than they would have done had they been made with the tools constructed for the purpose, and which are almost exclusively used in England.

With such tools, and in a soil similar to that of the Park, the cost of digging the trenches need not exceed the following figures:



Trench 3 feet deep, per rod.....	25c.
“ 4 “ “ .....	34c.
“ 5 “ “ .....	44c.

(This supposes the soil to be of the same character to the depth of 5 feet.)

The cost of removing stone from the trenches would be extra.

For the thorough drainage of land, the drains being placed at the various depths named above, the following length of drains will be required to drain one acre :

At 3 feet deep.....	140 R.
“ 4 “ .....	70 R.
“ 5 “ .....	35 R.

Total cost per acre of draining in soil similar to that of the Central Park (not including the removal of stone) and based on the use of 2-in. tile, say :

At 3 feet deep .....	\$75 00
“ 4 “ .....	44 00
“ 5 “ .....	28 00

Regarding further information, I would say that it will be well to purchase, this fall, one cargo of tile, as they can probably be delivered more cheaply at this season than at any other. This will ensure a sufficient supply for early spring work, and afford an opportunity for testing their consistency by the frosts of the coming winter.

Plans for the final drainage, which are essential to the proper performance of the work, may be commenced at once and could probably be completed during the winter. I am ready to proceed with this work as soon as it may be desired.

Respectfully,

GEORGE E. WARING, Jr.,

Supt. Draining of C. P.

New York, Oct. 1, 1857.

## Document No. 13.

---

### BOARD OF COMMISSIONERS CENTRAL PARK.

---

**TUESDAY, NOVEMBER 10, 1857.**

A copy of the ordinance authorizing issue of stock to the amount of \$250,000 for the improvement of the Central Park, was received and read.

Mr. DILLON moved that the same be printed. Adopted.

D. H. HART,  
Clerk.

---

#### AN ORDINANCE

TO PROVIDE MONEY FOR THE IMPROVEMENT OF THE CENTRAL PARK.

*The Mayor, Aldermen and Commonalty of the city of New York, in Common Council convened, do ordain as follows:*

SEC. 1. A public stock or fund is hereby created for an amount, the annual interest of which, with the interest on the stock of said fund already issued under an ordinance authorizing the same, shall not exceed the sum of one hundred thousand dollars, and shall be issued, from time to time, in such amounts as the Common Council shall, from time to time, prescribe by ordinance, which stock or fund shall be designated and known as "The Central Park Improvement Fund;" the interest payable half-yearly, and shall be redeemable in thirty years from the day on which the same is issued.

§ 2. The Comptroller is hereby authorized and directed to advertise, for thirty days, for proposals for the said fund or stock, or any portion thereof, in such amounts, from time to time, as shall be specially ordered by ordinance of the Common Council; but no proposal shall be received for less than the par value of a single share.

§ 3. The said fund or stock shares shall be divided into shares of the nominal or par value of one hundred dollars each.

§ 4. Such proposals shall not be opened until the day designated for the opening thereof, in the advertisement therefor; and on and after the expiration of said thirty days, the Comptroller shall determine which, and what proportion of said proposals shall be accepted; and shall issue certificates in form, as nearly as may be of the certificates issued for the Water Stock of the city of New York, for the amount so accepted, and to the person or persons, or corporation or corporations, whose proposals shall have been accepted.

§ 5. The Comptroller shall receive all moneys payable for and upon said fund or stock, and shall deposit the same in accordance with, and for the purposes specified in the provisions of an act, entitled "An act for the regulation and government of the Central Park, in the city of New York," passed April 17th, 1857

§ 6 The Comptroller is hereby authorized to issue stock, as aforesaid, pursuant to this ordinance, in the sum of two hundred and fifty thousand dollars.

Adopted by the Board of Aldermen, October 22, 1857.

Adopted by the Board of Councilmen, November 9, 1857.

Approved by the Mayor November 9, 1857.

D. T. VALENTINE,  
Clerk C. C.

## Document No. 14.

---

### BOARD OF COMMISSIONERS, CENTRAL PARK.

---

**TUESDAY, JANUARY 5, 1858.**

A report of the Chief Engineer, in answer to resolutions of December 15th, 1857, was received and read.

*Ordered,* That the same be printed.

D. H. HART,  
Clerk.

---

OFFICE OF CHIEF ENGINEER,  
Central Park, December 22d, 1857.

*To the Board of Commissioners :*

Gentlemen,—In answer to a resolution of the Board, calling upon me for a report upon the cost and character of the material now being prepared for roadway construction within the Park, I beg leave to state—

That the stone which is now being prepared for roads is undoubtedly the most durable material which can be obtained from any source whatever. At the same time it is the most

costly which can be used. It is possible, however, to make such a use of this material, in connection with other, as will insure solidity and durability without swelling the cost to an extent disproportionate to the amount necessary for other purposes of improvement. The stone now being broken is Diorite, a species of trap or basaltic rock, which has been transported here from a distance during the drift period, the time that all of the soil of the island was deposited where it now lies. It possesses both hardness and tenacity, essential qualities for a perfect road material.

The cost of breaking this stone, into the size necessary for use upon the roads, at the price at present paid for reducing the blocks from (6) six and (8) eight inches to (2) two inches (9c. per cubic foot), is  $\$3\frac{4}{10}$ , three  $\frac{4}{10}$  dollars per cubic yard, allowing (1) one dollar per cubic yard as the cost of drilling, blasting and breaking by sledges into the (8) eight inch cubes. The cost per mile of roadway composed entirely of this material will of course depend upon the width and depth at which it is applied. In any event it will be very great. But there is distributed through the drift and lying upon the surface a large quantity of other stone, which, though not equal to this in hardness or tenacity, yet possesses these qualities to a sufficient degree not to warrant their being rejected as road material. These stones have gone through the same process of attrition which has rounded the edges and smoothed the surfaces of the former, and they were submerged for the same period of time in that flood of waters without disintegration. To the eye no more effect has been produced on one than on the other. If they have been able thus to withstand the effects of the elements, and of attrition, they will answer to a certain extent the purpose for which we require them; in fact, if there were no harder stone, we would consider this very good material. There is also other stone—detached portions of rock in place, and quarry stone deposited in grading streets in the Park, all of which in a way can be made to subserve our purposes.

The question now arises as to the manner in which this material shall be applied, and of course upon this depends the cost of the road.

Without going into the details of the discussions which have

occupied the minds of practical men and theorists, both in England and France, and in fact throughout a large portion of Europe, it is sufficient to say that there are about as many different opinions as there are specimen roads. The circumstances connected with soil, climate and material to be obtained, enter so largely into all previous experiments, that it is impossible to accept any one series of these experiments as affording in their results the positive data upon which we shall proceed. Nevertheless there are certain fixed principles which, if we use them as a guide in directing our judgment, there is little probability of our failing of success. Acting upon this, I have drawn the specifications for a roadway, so as to combine what I consider a durable roadway, with the utmost economy, which will enable us to arrive at a satisfactory result. In order to do this, I propose to use one-third of the more tenacious stone to two-thirds of other material, costing one-half as much, and so disposing it as to get the full advantage of the harder stone, and in a shorter space of time than could be accomplished by using the latter exclusively. And I trust with the aid and co-operation of the Commission to form a roadway in all respects satisfactory and inferior to no roadway which has heretofore been constructed.

The course I propose is this: Assuming the required thickness of the road covering to be 12 inches, I place upon the bed which has been properly drained and rounded, a layer three inches in depth of the more friable stone, which is easily broken into the necessary size as fast as it is deposited, and upon this a layer of the same thickness of the hard though not the hardest stone. If these two layers are properly put on in the spring, and rolled with a heavy roller, they will serve perfectly well during the ensuing summer the purpose of a roadway. By adding in the autumn a layer of one-third the whole thickness, or four inches of the extremely hard stone, and upon it a layer of one-sixth or two inches of limestone, which will form a kind of cement especially essential upon the maximum grades to prevent the displacement of the hard stone, the whole being heavily rolled, I feel assured that nothing will be wanting to an excellent roadway.

I estimate the cost of material for such a roadway at about (\$2 $\frac{5}{100}$ ) two  $\frac{5}{100}$  dollars per cubic yard, or about (\$36,000) thirty-six thousand dollars per mile.

Another resolution calls for an opinion with regard to the hammers used in breaking stone.

The extreme hardness of the stone requires that the hammers used in breaking it should be made of the best cast steel, tempered to an exact degree of hardness, as it is liable to be either too soft or too brittle, and in either case worthless. The requisite weight is about one pound and a half. The handles also should be made of a material which affords a certain amount of elasticity. Many of the hammers which have been used have not fulfilled the required conditions. The makers have improved upon them since the work began, but the price paid for them is too high, as I have ascertained that they can be purchased from the manufacturers at (54c.) fifty-four cents, made of the best material and warranted, while those purchased cost (75c.) seventy-five cents.

Very respectfully, your obt. serv't,

EGBERT L. VIELE,  
Chief Engineer.

## Document No. 15.

---

### BOARD OF COMMISSIONERS, CENTRAL PARK.

---

**TUESDAY, MARCH 16, 1858.**

On motion of Mr. BUTTERWORTH—

*Ordered*, That the Annual Report of this Board to the Common Council, dated January 30th, 1858, be printed as one of the Documents of this Board.

D. H. HART,  
Clerk.

---

TO THE HONORABLE THE COMMON COUNCIL OF THE CITY OF  
NEW YORK:

The Commissioners of the Central Park, in compliance with an Act, entitled "An Act for the Regulation and Government of the Central Park in the City of New York," passed April 17, 1857—respectfully report:

That the Board was organized on the 30th of April, 1857, and shortly thereafter the necessary proceedings were taken for the purchase of the State Arsenal and all the grounds appertaining thereto belonging to the State, under the authority of the Act of the Legislature, passed April 15, 1857, and such property now forms a portion of the Central Park. By permission of this Board, the Arsenal is still occupied by the State for the storage of its arms.

The buildings on the Park, except those which are retained



for purposes of the Park or for public use, have been sold, and, with but few exceptions, have been removed from the Park.

Under the authority conferred by the 13th section of the Act first above mentioned, this Board agreed with the Croton Aqueduct Board for an exchange of lands belonging to the city of New York, lying within the area, bounded southerly by Fifty-ninth street, easterly by the Fifth avenue, northerly by One Hundred and Sixth street, and westerly by the Eighth avenue, and the maps and plans drawn with the object of combining as many features of beauty as was practicable with the preservation of convenience, strength and durability in the reservoir, have been accepted, and, after discussion and examination, determined on by the Croton Aqueduct Department and by this Board.

The Commissioners have deemed it a duty of the first importance to secure for guidance in laying out the grounds at the Central Park, the highest degree of taste and talent to be obtained; they have taken measures to secure designs from the landscape gardeners and rural artists throughout the world, and to invitations to contribute designs for the Park, the Commissioners have added inducements of liberal money premiums to those competitors whose plans shall be selected. Those intending to offer their designs will have an opportunity to do so until the first of March next; and until their designs are received, and a selection is made of the most superior of them, the Commissioners will have confined themselves to that portion of the work which is merely preliminary and necessary to put the grounds in a proper condition for the more delicate and tasteful process of improvement; dilapidated and offensive buildings, sheds, pens, cross-walls and fences, have been removed; stones that disfigured the surface have been gathered together, and such of them as have not been worked into the plain and substantial wall that now encloses the Park, are daily being broken preparatory to use on the roads that are soon to wind along the diversified surface of this great holiday ground of the metropolis; the natural water-courses have been opened, the swamps drained, and noxious weeds and useless undergrowth grubbed out and destroyed.

Two nurseries are established in the Park; and, after a proper fertilization of that portion of the ground set apart for this

purpose, about twenty-five thousand of a great variety of ornamental trees have been planted, the growing of trees on the ground being regarded by the Board as economical, in point of the diminished cost of small trees over those of larger growth, in the reduced expense of transportation, in losses by injury in their delivery, and in adapting them while young to the soil in which they are destined to flourish.

In these rude but essential preparatory operations, more than eleven hundred men have found employment during the singularly favorable weather of the fall and winter months; and it is only in this character of work that progress can advantageously be made until the Board have determined upon the design and plans by which the subsequent progress of improvement is to be guided.

The undertaking of laying out the Park is novel in its character; and while the work of its superficial ornamentation requires the exercise of a discriminating taste and high artistic skill, and the exercise of sound judgment, it is by no means the only feature requiring the study and attention of the Board.

A proper regard for the salubrity of the neighborhood demands the thorough and systematic drainage of the whole extent of the Park—a branch of the work essential, but by no means free from difficulties.

Many of the streets have been built over natural water-courses, without sufficient provision of culverts or sluice-ways, at proper levels, to allow the escape of the water, which, diverted from its natural courses, lies in stagnant pools upon the low grounds, deleterious to the health of the whole neighborhood.

In the drainage of the Park; in the adaptation of its surface, with reference to the elevations and depressions of the bounding streets and avenues; in the treatment of the ground bordering upon the Croton reservoir, already constructed, and upon the more tasteful grand reservoir, probably to occupy three years in its completion—the Commissioners of the Central Park expect to find abundant opportunity for the exercise of taste, ingenuity and judgment.

The report of the Treasurer of the Board, hereto annexed,

exhibits a detailed statement of all the receipts and expenditures of the Board, up to the first day of January, instant:

The total receipts are.....	\$304,050 39
“ “ expenditure.....	77,881 41
<hr/>	
Leaving a balance on 1st January of...	\$226,168 98

It is apparent that in the prosecution of this work its interests will be subserved by the co-operation of your Honorable Body and this Commission on many subjects of general interest to the public.

Although it is very desirable that the planting of the northern part of the Park should be commenced without delay, it cannot be properly done until it is enclosed, so as to exclude the cattle, goats, and swine that run at large in the neighborhood, the incursions of which are fatal to the safety of the young trees; and while the Commissioners are desirous to defer the closing of that portion of the (middle) road that lies within the Park until convenient access to the upper part of the island is otherwise provided, yet, in order to proceed with the work on the Park, this road must soon be closed; and to afford convenience for the public travel, the Board would respectfully suggest to your Honorable Body that the Fifth avenue be put in good travelling condition from Ninety-fifth street to One Hundred and Tenth street, which, having been partially accomplished, can be completed at a trifling expense, and thus enable them to close the road within the Park without inconvenience to the public.

The proper fertilization of the ground will require the deposit of large quantities of street manure on the Park; the Board has thought it practicable to effect an arrangement with the city authorities, by which the cleanings of the streets in most parts of the city may be transported by the city railroads to the immediate vicinity of the Park; by these means the necessary material for the enrichment of the Park may be obtained at the mere cost of transportation, which otherwise can be procured only at a great expense. Indeed, it would be but a matter of justice that the city railroads, considering the privileges they

enjoy at the hands of the public, should be required to contribute the use of their roads, without expense, for this purpose.

The subject of retaining walls along those portions of the Park that are depressed below the grades established by the city authorities for the streets and avenues enclosing the Park, is one upon which the Board believes the public interests may be best subserved by a concurrent action of your Honorable Body and this Board.

Permission to remove the surplus earth from Hamilton Square to the Park has already been suggested as desirable to be obtained, and the subject will, it is hoped, soon receive the favorable attention of the Common Council.

The propriety of adding to the Park the rocky bluffs at its north end, between the Fifth and Eighth avenues, One Hundred and Sixth and One Hundred and Tenth streets, which are useless for any other purpose than that of the Park, has already occupied the attention of the Board, and so soon as information relative to its probable cost has been gathered, the Board will take occasion to make its acquisition the subject of a further communication to your Honorable Body.

In the disposition of those questions of general interest that will continually arise in the progress of the work confided to them, the Commissioners feel assured from the past action of the Common Council that their efforts to prepare this pleasure ground for public use, in as brief time as is practicable with the thorough and substantial accomplishment of each step of its progress, and their determination to maintain strict order and discipline within the borders of the Park, will meet from your Honorable Body a ready and cordial co-operation.

By order of the Board,

JOHN A. C. GRAY,  
Vice-President.

DAVID H. HART,

Clerk.

Dated New York, January 30th, 1858.

*Dr.*

THE BOARD OF COMMISSIONERS OF THE CENTRAL PARK,  
*in account with* ANDREW H. GREEN, *Treasurer.*

1857.

Sept. 5.	To amount paid laborers, as per pay-roll		
	No. 1, on file in Comptroller's office,	\$13,230	61
" 26.	" " " 2 " " "	17,139	50
Oct. 10.	" " " 3 " " "	6,585	03
		\$36,955	14
	" Less amount returned by C. A. Rowalle, in allowance of pay, and deducted.....	24	50
		\$36,930	64
Oct. 9.	To amount paid E. L. Viele, Chief Engin'r, as per Voucher } No. 4, on file in Comptroller's office, }		729 16
" "	" " F. L. Olmsted, Supt., No. 5		82 20
" "	" " G. E. Waring, Jr., Supt., of Draining, " 6		238 38
" "	" " L. H. McIntosh, Con. and Dis. Clerk, " 7		68 50
" "	" " D. H. Hart & H. Saving, Clk. & boy, " 8		273 31
" "	" " J. H. Twiss, Computer, " 9		100 00
" "	" " H. Krause, Draughtsman, " 10		90 00
" "	" " F. Petrarchi, Laborer, " 11		11 25
" "	" " Henry Lyon, Park-Keeper, " 12		28 50
" "	" " I. V. Fowler, for postage stamps, " 13		3 00
" "	" " Windle & Co., for supplies, " 14		8 00
" "	" " J. J. Bloomfield, stationery, " 15		2 50
" "	" " N. Y. Daily Times, for subscription, " 16		6 50
" "	" " Cosgrove & Love, for wood, " 17		4 00
" "	" " Laborers, on transfer pay-roll, " 18		84 86
" "	" " Surveyors, to October 1st, " 19		1,099 58
" "	" " J. B. Bacon, Surveyor, to October 1st, " 20		206 58
" 28.	" " L. H. McIntosh, Con. and Dis. Clerk, " 21		126 73
" "	" " Mich. Miller, Property Clerk, " 22		66 67
Nov. 4.	" " N. Ewen, Surveyor, to October 1st, " 23		206 58
Oct. 29.	" " Lord & Taylor, for carpeting, " 24		183 37
" 28.	" " W. H. Cooke, 2 bills for furniture, " 25		326 50
" 29.	" " D. M. Smith, for carpenter work, " 26		144 09
" "	" " N. Y. Wire Railing Co., for hat-stand, " 27		12 00
" 31.	" " W. C. Bryant & Co. for advertising, " 28		47 64
" "	" " N. Y. Daily Times, " " " 29		31 32
" 30.	" " J. J. Bloomfield, stationery, " 30		146 19
	Carried forward.....	\$41,258	05

Brought forward.....				\$41,258 05
Oct. 30.	To amount paid Peter Harkin, for cleaning offices, as per } Voucher No. 31, on file in Comptroller's office, }			9 81
" 29.	" " D. H. Hart, for office expenses,	No. 32		52 70
" " "	" Breidenbah & Son, for painting,	" 33		103 75
" 31.	" " S. Philbin, for gas-fitting,	" 34		43 50
Nov. 2.	" " P. O'Grady, for repairs to locks,	" 35		13 90
Oct. 29.	" " R. B. Montgomery, supplies,	" 36		29 00
Nov. 3.	" " T. McKeon, for carriage hire,	" 37		11 00
Oct. 29.	" " E. W. Stoughton, for counsel fees,	" 38		150 00
" " "	" 4 bills advertising,	" 39		16 89
" 30.	" " L. Glynn, for burning fluid,	" 40		8 70
Nov. 1.	" " Park Keepers,	" 41		1,672 50
" 6.	" " Mich. Miller, Property Clerk,	" 42		66 67
" " "	" L. H. McIntosh, Con. and Dis. Clerk,	" 43		104 17
" 7.	" " E. L. Viele, Chief Engineer,	" 44		208 33
" " "	" D. H. Hart & H. Saving, Clerk & boy,	" 45		83 33
" " "	" G. E. Waring, Jr., Supt. of Draining,	" 46		125 00
" " "	" Jos. H. Twiss, Computer,	" 47		75 00
" " "	" H. F. Krause, Draughtsman,	" 48		60 00
" " "	" John Walch, "	" 49		56 00
" " "	" D. W. Horton, "	" 50		22 00
" 16.	" " N. Ewen, Surveyor,	" 51		100 00
" " "	" F. D. Ewen, "	" 52		45 00
" 14.	" " E. D. Ewen, "	" 53		60 00
" 12.	" " J. T. O'Flynn, Tool-Keeper,	" 54		22 00
" 14.	" " W. H. Arthur & Co., for stationery,	" 55		399 34
" 21.	" " G. W. Mayher, for tools,	" 56		35 75
" 7.	" " W. K. Strong, for carriage hire,	" 57		21 00
" " "	" N. Y. Daily Times, for advertising,	" 58		6 75
" 14.	" " R. W. Barnes, for hardware,	" 59		43 57
" " "	" Hardwick & Hall, for carpenter work,	" 60		284 45
" 7.	" " Gaylor & Carrington, for lumber, &c.,	" 61		136 79
" " "	" Geo. W. Smith, for express charges,	" 62		9 25
" " "	" R. L. Allen, for tools,	" 63		572 21
" " "	" H. F. Dibblee, "	" 64		308 85
" 10.	" " J. P. Harvey, minute files,	" 65		24 35
" " "	" John Jasper, Surveyor,	" 66		45 00
" 12.	" " F. H. Bacon,	" 67		60 00
" 13.	" " J. A. Bagley,	" 68		60 00
" " "	" H. Gabel, Draughtsman,	" 69		60 00
" 10.	" " J. C. S. Sinclair, Surveyor,	" 70		100 00
" 13.	" " G. J. Bacon, "	" 71		45 00
" 10.	" " M. McLaughlin, Axeman,	" 72		33 75
" " "	" Geo. Bruyn, Surveyor,	" 73		45 00
" 20.	" " W. and J. Sloane, for carpeting,	" 74		88 65
" 12.	" " Edward Doran, Axeman,	" 75		33 75
" 24.	" " J. L. Mott Iron Works, for stoves,	" 76		45 00

---

Carried forward..... \$46,855 76

Brought forward.....				\$46,855 76
Nov. 7.	To amount paid D. W. Norris, carriage hire, as per }			
	Voucher No. 77, on file in Comptroller's office, }			11 50
Dec. 2.	" " A. McCollum, blacksmith work,	No. 78		7 37
Nov. 7.	" " F. L. Olmsted, Superintendent,	" 79		125 00
" 17.	" " Treadwell & Jones, for tools,	" 80		842 86
" 21.	" " Discharged laborers on Park,	" 81		109 00
Dec. 1.	" " Park-keepers,	" 82		1,371 00
Nov. 28.	" " Laborers, as per pay-roll,	" 83		6,622 20
" "	" " Wm. Bruorton, Commissr. of Deeds,	" 84		4 00
Dec. 31.	" " Jas. McLoughlin, Axeman,	" 85		33 75
" 19.	" " Jas. McLoughlin, "	" 86		68 75
" 1.	" " L. H. McIntosh, Constr. and Dis. Clk.,	" 87		104 17
" "	" " Michl. Miller, Property Clerk,	" 88		66 67
" "	" " Geo. E. Waring, Jr., Supt. Draining,	" 89		125 00
" "	" " F. L. Olmsted, Superintendent,	" 90		125 00
" "	" " F. H. Saving, Office Boy,	" 91		16 67
" "	" " D. W. Horton, Draughtsman,	" 93		60 00
" "	" " D. H. Hart, Clerk,	" 92		66 67
" "	" " H. Gabel, Draughtsman,	" 94		54 00
" "	" " John Walch, "	" 95		60 00
" "	" " H. Krause, "	" 96		60 00
" "	" " E. L. Viele, Chief Engineer,	" 97		208 33
" "	" " J. H. Twiss, Computer,	" 98		75 00
" "	" " C. K. Graham, Surveyor,	" 99		306 58
" 10.	" " S. I. Gustin, Nurseryman,	" 100		100 00
" 28.	" " G. W. Hinchman, Jr., Surveyor,	" 101		144 25
" 10.	" " D. W. Horton, Draughtsman,	" 102		20 00
" 31.	" " E. L. Viele, Chief Engineer,	" 103		208 33
" "	" " F. L. Olmsted, Superintendent,	" 104		125 00
" "	" " G. E. Waring, Jr., Supt. of Drawing,	" 105		125 00
" "	" " S. I. Gustin, Nurseryman,	" 106		100 00
" "	" " Michl. Miller, Property Clerk,	" 107		66 67
" "	" " D. H. Hart, Clerk,	" 108		66 66
" "	" " F. H. Saving, Office Boy,	" 109		16 66
" "	" " F. Petrarchi, laborer,	" 110		23 75
" "	" " J. B. Bacon, Surveyor,	" 111		293 33
" "	" " F. H. Bacon, "	" 112		176 00
" "	" " G. J. Bacon, "	" 113		132 00
" "	" " S. C. Herring, for safe,	" 114		300 00
" 16.	" " W. Bruorton, Commr. of Deeds,	" 115		3 50
" 22.	" " F. Petrarchi, laborer,	" 116		57 50
" 12.	" " Laborers, cartman, &c.,	" 117		9,596 98
Oct. 10.	" " " " on T. P. R.,	" 118		89 11
Nov. 28.	" " " " " "	" 119		110 93
Dec. 28.	" " Discharged laborers,	" 120		752 25
" 26.	" " Laborers, cartman, &c.	" 121		7,994 21
1858.				
Jan. 1.	Balance,			226,168 98
				<u>\$304,050 89</u>

*Cr.*

THE BOARD OF COMMISSIONERS OF THE CENTRAL PARK,

*in account with* ANDREW H. GREEN, *Treasurer.*

Sept.	17.		By cash proceeds of sale of buildings at Park, September 23,	\$1,373	62
"	"	"	" " " "		885 00
"	29.	"	" Stock issued by Common Council,.....	25,000	00
Oct.	2.	"	" " " .....	25,000	00
"	"	"	" buildings, from laborers on the Park....	136	25
Nov.	7.	"	" being amount paid by laborers for tools lost \$255 50		
"	"	"	" recd. fm. Saml. Osgood, for buildings on Park 15 00		
					270 50
"	12.	"	" advance of Comptroller on ac. second issue of Bonds,	30,000	00
Dec.	4.	"	" amount of rent due from Wm. Menck, to Feb. 1858,	50	00
"	"	"	" proceeds of sale of buildings on the Park, December 3, 1857,.....	1,535	00
"	14.	"	" advance of Comptroller on ac. second issue of Bonds,	20,000	00
"	15.	"	" from Comptroller, on account second issue of Bonds,	50,000	00
"	19.	"	" " " " " "	100,000	00
"	21.	"	" " " " " "	50,000	00
"	31.	"	" being amount over in making change,.....		00 02
					<u>\$304,050 39</u>



## Document No. 16.

---

### BOARD OF COMMISSIONERS, CENTRAL PARK.

---

**TUESDAY, MARCH 16, 1858.**

A Report from the Chief Engineer, on "A Comprehensive Plan of Drainage," was received.

*Ordered,* That the same be printed.

D. H. HART,  
Clerk.

---

### THE DRAINAGE OF THE CENTRAL PARK.

A very small portion of the water which is discharged from the clouds upon the earth during the year is absorbed by the soil, or is requisite as a constituent of vegetation. All the moisture that remains in the soil beyond this required quantity is not only useless, but absolutely injurious to its productiveness, and must be removed to insure the proper growth of vegetation. It would be a difficult matter to find, within a space of like extent, a more striking instance of this general principle, than is exhibited by the grounds of the Central Park. The rank grasses and poisonous weeds, the stunted growth, and trees with sickly yellow leaves, show the character of the soil, while the emaciated appearance of the wretched occupants of the numerous hovels which have but lately been removed, indicate the malarious state of the atmosphere which they breathed.

This palpable evidence of the present condition of the ground requires no argument to prove the necessity of draining it in some way. What this way should be, and to what extent it should be carried, is the problem which we have to solve. In all experiments connected with drainage, and in all the discussions with reference to the extent to which it should be pursued, the subject is treated chiefly in an agricultural point of view, resulting in close calculations with reference to the profits arising from an increased productiveness through the expenditure necessary to secure a thorough drainage of the soil, the main point sought to be established being that of pecuniary advantage. Although it is not probable that the grounds of the Central Park will ever be worked for remunerative productions, nevertheless the predominant principle is the same, viz., the most perfect possible developement of vegetation, whether as trees, shrubbery, or sward; therefore, the facts elicited from agricultural experiments hold good in the preparation of the soil of the Central Park for the purposes to which it is to be devoted, the character of the soil governing the application of these facts.

I refer more particularly to the facts developed by experience in this country, since the great difference in regard to climate, topography, and geological formation between this country and England, precludes the blind adoption of any system, no matter how successful it may have been there proved to be. For guidance in our action, we must look first to the character, the quantity, and sources of supply of the water which we wish to remove. Knowing this, the topography of the ground and character of the soil will determine the best course to be adopted in removing it. Of the water on the Park, a portion flows from the adjoining lands, a quantity is developed in local springs, and some of it is in stagnant deposits of rain-water. From these sources nearly the entire soil is saturated, cold, and sour.

The immediate effect of this water in the soil upon vegetation is to stiffen it to such an extent that the roots of plants are unable to penetrate it, and being thus stifled in their growth, the plant itself is stunted by chilling the soil; it discourages the roots from extending themselves sufficiently to obtain and afford the proper nourishment to the plants. By

the constant evaporation which is going on, the heat of the surface is reduced, especially in the spring and autumn, thus shortening materially the period of vegetation. It sours the soil, producing a rank, unhealthy vegetation. It occupies the soil to the exclusion of air, thus depriving the roots of the most important accessory to vegetation. It excludes the rain-water, which contains the elements of fertility. It causes surface-washing, and the consequent formation of gullies and fissures. It causes the exhalation from the soil of miasmatic odors, which taint the atmosphere and have a deleterious effect upon health.

The effect of under-draining will be to cause the pulverization of the soil by removing the source of adhesion, and thus facilitating the mechanical extension of the roots, and their consequent development. It elevates the temperature of the soil by allowing the free passage of warm rain-water, which at the same time deposits the elements of fertility it has extracted from the atmosphere, thus increasing the resources of vegetation.

The power of absorption is increased, which enables the soil to support vegetation in the absence of regular rains. It facilitates the passage of air to the roots, supplying the proper amount of oxygen necessary to them. It deepens the soil, giving the roots of trees a firmer hold and removing them farther from the effects of the summer sun, and renders them less liable to freeze in winter. It lengthens the seasons of vegetation. It prevents surface-washing, by allowing the rain-water to descend through the soil at once. It renders the surface dry at all seasons, especially in the spring, and excludes the possibility of miasma.

In preparing a practical plan of draining, which shall be productive of these results upon the grounds of the Central Park, I have assumed, as a basis of operations, the natural water-courses now in existence within the area, since no more ready channel could be found for the discharge of the water, besides which, they, with the increased supply derived from the artificial drains, will constitute effective features in connection with the improvement of the grounds. These streams drain the surface of the larger valley, and their small branches ramify themselves through the lesser depressions. During certain seasons of the year, there is through them a heavy flow of water, while at

others the quantity is very small. The effect of connecting them with artificial drains will be to make the supply of water more constant. The first of these streams originates in low swampy grounds at the junction of the Eighth avenue and Sixty-first street. The avenue has been graded directly through the swamp; an imperfect culvert having been constructed beneath the road-bed. Until recently, a large body of stagnant water has been suffered to stand at this point on both sides of the avenue, emitting the most noxious odors. The stream runs northerly from this pond, but turns and re-enters the Park, crossing the Eighth avenue at Sixty-fifth street; from this point it crosses the ground of the Park diagonally, leaving at Fifty-ninth street, between Fifth and Sixth avenues.

As this stream will form a permanent outlet for a large portion of the water of drainage, it may not be unimportant to trace its after-course, as it will be necessary to adopt some scheme in connection with the city authorities, to provide for an uninterrupted flow of the water. After leaving the Park at Fifty-ninth street, (where there is another imperfect culvert which will require reconstruction,) the stream crosses Fifth avenue near Fifty-eighth street, again crossing Fifty-ninth street, between Fourth and Fifth avenues; then crossing the same street a third time, it passes under Fourth avenue, between Fifty-eighth and Fifty-ninth streets; then crossing Fifty-eighth, Fifty-seventh, Fifty-sixth and Fifty-fifth streets, between Third and Fourth avenues, it empties into a sewer at the junction of Third avenue and Fifty-fourth street. There will probably be a sewer constructed, which will receive the water at some point nearer the Park, but between that point and the Park it will be necessary to have a large well-built drain, which will require the passage of an ordinance applying also to similar cases in connection with other outlets of water from the Park. A second stream, a branch of this one, originates within the Park, and is conveyed under the Arsenal, through a well-built sewer, and under the Fifth avenue at Sixty-fourth street, where it debouches to the surface, and crossing Sixty-third, Sixty-second, Sixty-first and Sixtieth streets, joins the main stream at the junction of Fourth avenue and Fifty-ninth street. Another principal stream rises west of the Park limits, between Ninth and Tenth avenues, and enters the Park at Seventy-fifth street

and Eighth avenue; it has three branches within the Park, one rising west of the reservoir, which leaves and re-enters the Park across Eighth avenue, another immediately south of the reservoir, and a third rising in the lower part of the Park. The main stream leaves the inclosure at Seventy-fourth street, passing under the Fifth avenue, crossing Fourth avenue and Third avenue, between Seventy-fourth and Seventy-fifth streets,—crossing and recrossing Seventy-fifth street between Second and Third avenues,—crossing Second avenue and Seventy-fourth street near First avenue,—crossing First avenue under and near Seventy-fourth street,—crossing and recrossing Seventy-fourth street between avenue A and First avenue,—crossing avenue A between Seventy-fourth and Seventy-fifth streets and avenue B between the same, it empties into the East river. The various turnings are being caused by ledges of rocks; a large body of water passes through this channel, and, at one time, was used for mill purposes. It is important that early action should be taken by the city authorities to preserve this outlet by a substantial construction.

Another outlet for drainage water will be required between Eightieth and Ninetieth streets at Eighth avenue; a depression at this point at one time received the surface-water from the ground west of the Park. Since the avenue has been graded, another incomplete culvert (in fact, all the culverts built by the city under the streets and avenues are worthless,) has stopped the free flow of the water and created a stagnant pond on the west side of the Eighth avenue. The construction of the new reservoir will prevent any further drainage toward the East; but by lowering the culvert under the aqueduct, the drainage can be readily effected towards the West into the North river. Another outlet of water occurs at Ninety-ninth street and Fifth avenue. This stream originates within the Park, and, after leaving it, crosses One hundredth, One hundred and first and One hundred and second to One hundred and third streets, between Fourth and Fifth avenues, where it is discharged at tide-water on the Harlem plain. The last water course originates outside of the Park, near Ninety-second street and Ninth avenue, and enters the Park under the Eighth avenue, near One hundred and first street, leaving at One hundred and sixth street, between Sixth and Seventh avenues,

and is discharged at tide-water near Fifth avenue and One hundred and ninth street. The course of these streams indicates clearly the necessity for a concert of action between the city authorities and the Commissioners of the Central Park. Either sewers at a sufficient depth must be built through the streets nearest the courses of the streams, or heavily-built covered drains must be laid in the beds of the streams, after they have been properly excavated. The latter course would be most beneficial to the health of the city, since the filling up of old water-courses in the lower part of the city have already resulted in the constant presence, in their immediate localities, of fevers and other diseases incident to a humid and miasmatic state of the atmosphere; and it will undoubtedly be found, during the prevalence of any contagious disease, that these localities will suffer the most. It is evident that these water-courses must constitute a portion of the system of drainage. They may be left opened or covered, as the supply of water shall prove to be permanent or temporary. Since the commencement of the work on the Park, all obstructions to the free flow of water through them have been removed, and ditches have been opened into all deposits of water of every kind. In the case of the stagnant pond at Eighth avenue and Sixty-second street, it was necessary to open a channel through the rock to let off the water. A very decided change for the better has already taken place in the removal of a large quantity of water from the surface. We have now to determine the character of the artificial drains which, in connection with the water-courses, shall put the ground in a condition to be used for the purposes for which it is intended. Numerous methods have been resorted to with stones, planks, brushwood and open drains, as temporary expedients; but experience has shown that the only effectual, and in the end most economical, method is that of using porous tile-drains. If properly laid, they thoroughly extract the surplus water from the soil, and form no impediment to vegetation. There are three kinds of these tiles, the cylindrical, the horse-shoe, and the sole-tile, the latter being the most effective in its results, and most readily adapted to all circumstances of soil. They are made of different sizes, from two to six inches in diameter, and about a foot in length.

The location, size, distance apart, and depth of drains, has formed a most fruitful subject of discussion in agricultural journals, and whenever the subject has been referred to at agricultural conventions, and meetings of farmers' clubs. As a matter of course, much reliable information, as well as much that is unimportant, has been made public in this way. But the only conclusion which can be arrived at is, that as all soils differ in their mineral constituents, so do they differ in their retentive powers; and that while Elkington's system of deep drainage would apply best to one, and Smith's or the Deanston system of shallow drainage would apply better to another, there are still innumerable cases where both would be rejected as inapplicable. Therefore, that course will prove to be the most practical which is based upon a knowledge of the character of the soil in each particular localit

#### LOCATION OF DRAINS.

The circumstances which develop themselves as the work progresses, will go far to determine the precise location of the drains. As a general rule, the principal drains should follow the lowest depressions, the branches running directly down the slopes. Where the ground is nearly level, they should oblique towards the main drain; and where the ground descends from all points towards a common centre, it would be judicious to run a drain around the edge of the slope to intercept the flow connecting this through the branches with the main drain.

#### SIZE OF DRAINS.

The size of the drains is governed by the probable amount of water which must be carried off. As the volume of water increases by means of the lateral branches, the size of the drains will require to be increased. Where it is found that the water accumulating, or to accumulate from the different branches, would be greater than could be discharged through the largest sized tiles, a double or even a triple row may be laid together in the same trench.

## DEPTH OF DRAINS.

The depth of the drains is the most important point connected with the subject, and one which will require the exercise of the most careful judgment. The first care should be to secure a proper outlet, at whatever depth it may be necessary to go to obtain it. To this point there must be a continuous descent of at least one foot in eight hundred, uninterrupted by any depressions, since these would cause an accumulation of deposits which would in time choke the drains. The earth in the Central Park consists, first, of a few inches of soil, then a layer, varying in thickness from one to ten feet, of clay, beneath which is hard-pan or drift. In the larger depressions, there is quicksand beneath this, and then the gneiss rock of the Island. Throughout a very large portion of the area, the rock is either above or very near the surface, and scattered through the drift an innumerable quantity of boulders, which defy the precise location of drains, except on the ground itself. As a general rule, the main drains should be from three to four feet below the surface, and the lateral drains from two feet six inches to three feet. An increase of depth adds largely to the expense, especially in the hard-pan, where it will cost almost as much to keep the picks sharp as the labor is worth, and in the end adding perhaps no benefit to the ground. Still, no question of economy should prevent the drainage being thoroughly accomplished.

The drain should be laid below the frost, and must be below the reach of the subsoil plow or trenching tools. The fact that a large quantity of soil and fertilizing matter will be added to the present soil, which is rather worthless in its character, will govern somewhat the depth beneath the present surface.

## DISTANCE BETWEEN DRAINS.

There exists a positive relation between the depth of drains and their distance apart—the tenacity of the soil being the governing principle. The more retentive soils require the drains to be nearer the surface and nearer together, say from fifteen to thirty feet, while in porous soils the drains should be



deeper, and may be further apart, say from twenty to sixty feet. The thorough working or trenching the ground will obviate the necessity of placing the drains as near to each other as would be required to remove immediately the water now present in the soil. When this, which now occupies the ground so universally, is removed, that which falls afterward would find in the soil, rendered porous by being worked, a ready outlet through drains, which would have less immediate effect upon the ground.

The leading principles which have been enumerated have been followed out in the construction of the plan of drainage which accompanies this report. It is not deemed essential to enter into the details of digging the trenches. If not done by contract, the lines of drains should be laid out, and the gangs so divided that each man shall work with certain tools—one, with a spade for the top soil, another with a pick, and another with a shovel, to throw out the loosened earth; beginning at the lower end, and each following the other, deepening the ditch layer by layer, until it has the required depth; the relative expertness of the men deciding which tools they shall use. Trial drains should be run at each separate locality, to ascertain the depth at which the water oozes from the ground into the ditches, thus determining the depth of the drains. It is probable that, in some instances, there will be required small brick cylindrical drains to withstand the rush of water at certain seasons of the year—the effect of which will be lessened as the portion of the city adjoining the Park is built upon.

Upon the plan which has been prepared has been traced the principal streams with the connections of artificial drains deemed necessary to the thorough drainage of the ground. The positions of these drains will be governed by circumstances; but the general system, as laid down, will remain essentially the same. At some points the drains will be further apart; at others, perhaps, nearer together. It is believed, however, that the scheme covers the maximum amount of expense that will be required for this purpose.

Whether the work should be done by contract or day's labor could be very well decided by letting a small portion of the ground by contract as an experiment, while a similar portion is undertaken by day's work; the result will soon determine the

relative cost of each. Any attempt to arrive at a calculation in any other way would be absurd.

The number of tiles required, as estimated by the plan, will be

2 inch	292,600, costing (delivered at the dock)	\$4,389 00
3 "	166,900, " " "	3,838 70
4 "	60,900, " " "	2,862 30
5 inch	12,700, costing (delivered at the dock)	889 00
6 "	24,800, " " "	2,380 80
Total.....		\$14,359 80

It is possible that a contract can be made to make and lay the tiles, and dig and refill the trenches, at the following rates :

2 inch	17,733, rods.....	\$18,915 54
3 "	10,115, " .....	15,105 54
4 "	3,690, " .....	7,627 88
5 "	769, " .....	2,175 74
6 "	1,503, " .....	5,350 78
Total.....		\$49,175 48

To which, adding \$5000 for the brick drains which will be required, and \$2500 for the construction of the proper outlets, would make the probable total cost of the thorough drainage of the Park \$56,675 48. As this work should be commenced at once, I would recommend that early steps be taken to place the tile on the ground, when the work may be done by contract or days' work, as shall be deemed best.

Respectfully submitted,

EGBERT L. VIELE,  
Chief Engineer,  
Central Park.