

DEPARTMENT OF PARKS

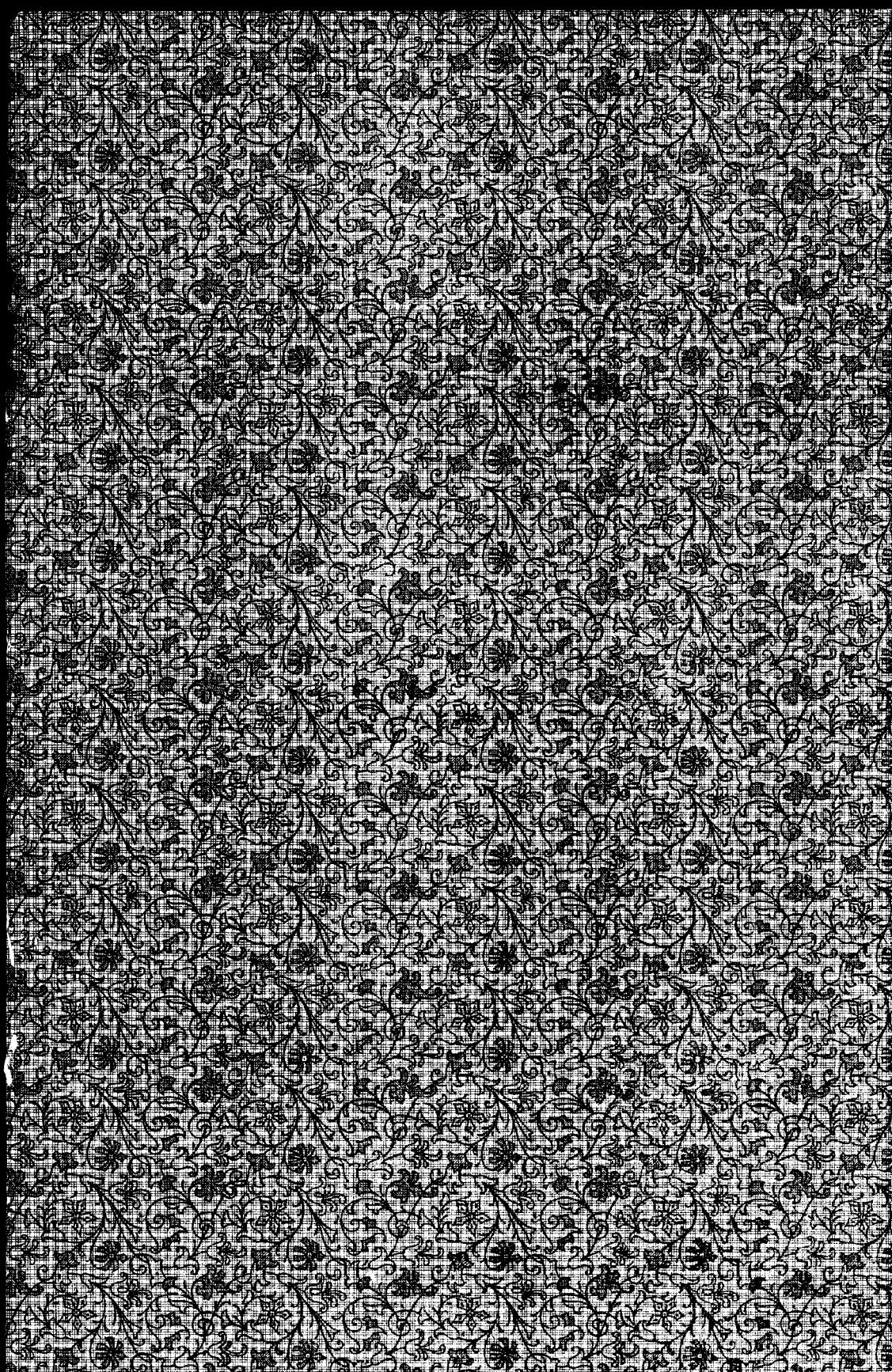
CITY OF NEW YORK.

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ANNUAL REPORT

FOR

Year Ending December 31, 1901



REPORT

OF THE

Department of Parks

FOR THE

YEAR ENDING DECEMBER 31, 1901

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NEW YORK:  
MAIL AND EXPRESS COMPANY,  
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1902.

# Department of Parks.

Report for the Year 1901.

December 31, 1901.

Hon. ROBERT A. VAN WYCK, Mayor:

Sir—I have the honor to transmit herewith a report of the finances and operations of the Department of Parks, boroughs of Manhattan and Richmond, The City of New York, for the year 1901.

The pressure of business in closing up my official term makes it impossible for me to make a resume from the reports of the officials of the Department. I beg leave, therefore, to submit them as received. Yours respectfully,

GEORGE C. CLAUSEN,

Commissioner of Parks, Boroughs of Manhattan and Richmond.

## EXPENDITURES, INCLUDING ENGINEERING, ETC., 1901.

### Riverside Park and Drive, Completion of Construction—

Grading and constructing drainage and walks.....	\$ 5,823.66
Construction of viaduct over West Ninety-sixth street.....	141,058.32
Constructing walks, etc., east of the westerly wall of drive between Seventy-ninth and One Hundred and Fourth streets.....	150.00
Tree planting, etc., in Riverside Park west of Riverside drive and north of Ninety-sixth street.....	470.21
Improving between Ninety-sixth and One Hundred and Twenty-Fourth streets, planting, etc., around Grant's Tomb, grading, etc., between One Hundred and Twentieth and One Hundred and Twenty-seventh streets, etc.....	73,397.94
Construction of walks, Riverside Park south of Seventy-ninth street....	4,866.49

### Improvement of Parks, Parkways and Drives—

Central Park, improvement of, paving and repaving with asphalt the walks .....	1,117.21
Erecting buildings in city parks for distribution of milk.....	4.98

Widening roadway, One Hundred and Fifty-third street between Seventh avenue and Macomb's Dam road, and improving sidewalks, etc., north of One Hundred and Fifty-third street, etc.....	40.95
Paving with asphalt pavement, etc., the sidewalks of transverse roads 1, 2 and 3.....	195.20
Paving with asphalt the easterly and westerly sidewalks, Manhattan Square .....	113.53
Hancock Park, improvement of.....	974.88
Laying asphalt walks, leveling playgrounds, etc., East River Park.....	57.67
Improving Swedish schoolhouse, Central Park.....	512.45
Asphalting in other localities in Central Park.....	373.86
Constructing new walks around Arsenal Building and repairing and constructing other walks in Central Park.....	2,380.50
Improving principal entrance to Central Park, Fifty-ninth street and Fifth avenue.....	118.03
Central Park, improvement of, paving the Circle, Fifty-ninth street and Eighth avenue .....	890.22
Transverse road No. 1, improvement of, etc.....	49.49
Transverse road No. 2, improvement of, etc.....	27.78
Transverse road No. 3, improvement of, etc.....	10.55
Central Park, improvement of, resurfacing walks with asphalt from Fifty-ninth street to transverse road No. 3.....	45.00
Fifth avenue, paving with asphalt from Fifty-ninth to Sixtieth street.....	89.28
Central Park, improvement of; completing sidewalk on Eighth avenue, Fifty-ninth to One Hundred and Tenth street.....	212.50
Resurfacing walks in parks south of Fifty-ninth street.....	89.07
Transverse road No. 4, improvement of, etc.....	179.66
Morningside Park, improvement of, north of One Hundred and Twentieth street, and completion of walks south of One Hundred and Twentieth street.....	36.42
Repaving with asphalt, Eighty-sixth street, from Central Park West to Riverside Drive .....	19,478.31
Washington Park, in the Town of Stapleton and the small park in Port Richmond, Borough of Richmond, improvement of.....	1,322.56
Regulating the grounds and making drives and walks around the Casino, Central Park .....	7,715.13
Construction of Mt. Morris and East River parks.....	524.05
Rutger's Slip Park, Improvement of.....	492.05
Public driveway, construction of.....	11,953.37
Cathedral parkway, improvement and completion of, etc.....	17,829.43
Mulberry Bend Park, construction of.....	11,746.90

Central Park, construction of, laying asphalt walks.....	1,277.61
Jefferson Park, improvement of.....	53,257.44
St. John's Park construction of (Hudson Park).....	436.72
East River Park, improvement of extension.....	12,406.99
Eleventh Ward Park Fund, Hamilton Fish Park.....	8.00
New York Public Library Fund.....	204,162.51
Equestrian and pedestrian entrance to Central Park West at West Sixty-sixth street, construction of.....	5,873 39

Contract No. 2, for the Construction of Fortieth Street Vault, etc.—Work on this contract, executed in March, was begun in April. It being a lump sum contract, detailed measurements of various items of work were not made. It is, however, estimated that about \$15,000 worth of work or about 40 per cent. of the whole contract has been completed.

Contract No. 3, for the Complete Erection of Library Building—This contract, amounting to \$2,865,706, was executed during August. But little work, other than of a preparatory nature, and the building of frame offices for the architects has been done. A start has, however, been made in the building of brick walls, etc., in the northeastern corner of the building proper.

Viaduct Over Ninety-sixth Street, Riverside Drive—For many years the necessity of carrying Riverside drive over Ninety-sixth street was felt, Ninety-sixth street being a trucking thoroughfare and in great demand. Owing to the fact that the public docks are at the foot of the street, some scheme had to be devised to relieve the congested traffic at its junction with Riverside drive. During the latter part of 1900 work on the construction of a Viaduct was actually begun; and it will be practically completed at the close of this year. In connection therewith public comfort stations, toolhouses and park entrances will be constructed and erected, leaving nothing to be done but the shaping, sodding and planting of the park lawns and slopes and the laying out of new park walk systems. Upon the completion of this work the beauties of Riverside drive will be greatly enhanced and public safety assured.

It might be more than of passing interest to mention the amount of work done on this construction during the year.

Summary of Work Done on Viaduct Over West Ninety-sixth Street for Year 1901—1,861 cubic yards foundation excavation; 20,000 cubic yards borrowed fill in place; 900 cubic yards foundation concrete laid; 906 cubic yards east retaining wall first-class rubble masonry laid; 1,694 cubic yards anchor walls above foundation, &c., built; 160 cubic feet pedestal pier caps set; 8,650 cubic feet granite sidewalk pedestals erected; 710 cubic feet granite pedestals, pier cap and bases set; 18 square granite balusters set; 27 round granite balusters set; 325 cubic feet granite steps and cheeks

set; 200 linear feet granite anchor wall coping set; 200 linear feet blue-stone tail wall coping set; 992 cubic feet granite east retaining wall coping set; 842,900 pounds iron and steel in place; 927 square yards asphalt over buckle plates in place; 3,100 square yards gravel surface telford park roadway constructed; 300 square yards asphalt sidewalk Ninety-sixth street under drive laid; 183 linear feet granite curbing on Ninety-sixth street under drive set; 1,200 linear feet new curbing on driveway set; 6 new catch basins complete with connections with sewer; 4 catch basins removed and rebuilt with connections; 371 linear feet 12-inch vitrified drain pipe laid; 426 linear feet gas pipe railing set in place; 125 cubic yards foundation excavation; 317 cubic yards foundation walls rubble and concrete built; 266 cubic yards foundation excavation; 364 cubic yards foundation walls rubble and concrete built; 1-2 of the pavilions complete with steps, &c.; 6,700 cubic yards borrowed park filling in place; 521 cubic yards foundation excavation for walls; 275 cubic yards foundation concrete in place; 901 cubic yards walls on Ninety-sixth street below coping built; 1,358 cubic feet granite coping and cap stones set; 176 cubic yards wall work below coping along railroad built; 127 linear feet granite coping for wall along railroad set; 653 linear feet steps and cheeks set; 350 square yards asphalt walks on Ninety-sixth street laid; 200 square yards asphalt walks in park laid; 250 linear feet curb reset along Ninety-sixth street; 1 tool house complete, &c., 7-10 of the public comfort house complete, &c.; 262 linear feet of 2½-inch blue-stone edging, straight and curved, furnished and set.

The cost of the Viaduct when completed will be approximately \$206,000.

In connection with the work "Constructing Ninety-sixth Street Viaduct" it was found necessary to build a new city sewer on the easterly side of Riverside drive between Ninety-fifth and Ninety-seventh streets to take the place of the then existing one, which was located directly under the easterly retaining wall.

Although the work on the sewer proper was practically completed during last year, and so reported on in my last annual report, the work of laying drain pipe through the walls for house connections with sewer was not done until this year.

It required the laying of 570 feet of six inch pipe to complete this work. The cost of sewer and house connections was \$5,184.

#### RIVERSIDE PARK.

Repaving Walks with Asphalt, Seventy-second to Seventy-ninth Street—The asphalt wearing surface of the walks in Riverside Park between Seventy-second and Seventy-ninth streets, which was laid many years ago, was found to be in a badly disintegrated condition, full of holes and dangerous to travel. A small construction balance was made available; and that section of park was put in perfect condition. The cost was \$5,073.88 and the work done: 33,813 square feet of rock asphalt mastic wearing surface laid; 18 cubic yards concrete in foundations.

Ninety-sixth to One Hundred and Twentieth Street—Considerable damage was done to the walks in this section by washouts, through heavy storms, &c., and extensive repairs were necessary. A contract was entered into and the walks were placed in generally good repair at a cost of \$2,334.81. The amount of work done follows: 7,083 square feet of rock asphalt mastic surface laid; 48½ cubic yards concrete in foundations.

#### CATHEDRAL PARKWAY.

Repairs to Roadway, Curb, &c.—In the original construction of Cathedral parkway, between Seventh avenue and Riverside drive, it was found necessary to build some of the roadway and set a great deal of the heavy curb upon what is known as green fill; this was owing to the fact that One Hundred and Tenth street was widened. As a natural consequence, depressions of a considerable depth were found in the pavement of roadway, and the curb went down in some places to a depth of four inches. After the filling had finally reached its proper settlement and in order to remedy these defects and place the parkway in proper repair a contract was executed to repave certain portions of roadway, reset curb, pave with asphalt Eighth Avenue crossing Circle, lay new bridge stone and bicycle strips, etc. The cost of these repairs amounted to \$11,503.26, and the work done as follows: 4,784.41 linear feet of curb reset; 266.87 linear feet new eight-inch curb furnished and set; 2,880.95 square yards of granite block pavement relaid; 754.52 square yards of asphalt roadway laid; 1,151.02 square feet of bridge stone relaid; 1,329.52 square feet of new bridge stone furnished and laid.

#### EAST RIVER PARK EXTENSION.

Completion of Sea Wall—A contract for the completion of the sea wall along the easterly front of this park was executed during the late spring and work on same begun during the latter part of May. This work is still in progress of construction but its early completion is assured. Upon the acceptance of the same it is the intention to construct an esplanade along the entire wall line, thereby affording to the public a promenade and water view and adding to the general attractiveness of the park. The executed contract amounts to \$32,925 and the work done to date follows: 300 cubic yards of earth excavation for esplanade; 10 cubic yards of rock excavation for esplanade; 900 cubic yards of filling in place; 690 cubic yards of excavation of all kinds for wall; 1,250 cubic yards of wall masonry built; 110 cubic yards of concrete laid; 340 linear feet of granite coping furnished and set, and the general construction of coffer dam for remainder of walls.

#### MULBERRY BEND PARK.

Repairs to Pavements, Curb, etc.—The cement walk pavement of this park had become broken and settled badly; in places depressions to the depth of one foot were



found. The curb and edging had gone out of line and grade, the lawns had settled, and other defects were presented. In order to place the park in proper repair a contract was entered into to remove the existing house connections, to cap the water mains, to repair the pavements, to reset curbs and edgings, to repair, reset and repaint pipe fence railings and to restore lawns, etc. The cost of this work was \$10,091.22 and the work done as follows: 351.25 linear feet curb reset; 2,813.19 linear feet edging reset; 31,836.97 square feet cement walk laid; 98.84 cubic yards mould furnished and deposited; 14,819.66 square feet sod furnished and laid; 41 taps removed from water mains and plugged; 3,182 linear feet fence taken down, reset, etc.; 4 drinking hydrants repaired and reset, and new brick vault basins built for them.

#### THOMAS JEFFERSON PARK.

Regulating and Grading, Contract No. 1—Chapter 746, Laws of 1894, lays out as a public park all the lands between One Hundred and Eleventh street, First avenue, One Hundred and Fourteenth street and the bulkhead line of the East river. Upon the completion of the work of removal and demolition of buildings a contract for the regulating and grading of this park was executed during 1900 and the work was completed during 1901. The work embraced in this contract was the excavation and removal of brick masonry, rubbish, walls, stone, earth, etc., to a general depth of from four to five feet, and the refilling of the entire area with clean, wholesome earth filling. This method of construction was accepted as the best, in so far as it provided a wholesome underfill for plantings, and when complete settlement of materials had taken place the curbs, walks, lawns, etc., of permanent park layout would remain in place. The existing house connections from Croton mains were capped and street pavements restored. An enclosing fence was erected around entire park.

The total cost of the work embraced in this contract was \$33,055.89 and the work done this year follows: 22,111 cubic yards of excavation; 27,668 cubic yards of filling in place; 2,677 linear feet of board fence erected.

Contract No. 2. Regulating and Grading—Upon the removal of the gas house offices, properties, etc., at One Hundred and Eleventh street and First avenue, it was found necessary, owing to certain litigation pending relative to rights, etc., of company at the time Contract No. 1, for regulating and grading, etc., was considered, to enter into a second contract for regulating, grading, etc., this part of the park in the manner described in Contract No. 1.

This work was completed at a cost of \$3,631.30 and the work done follows: 6,122 cubic yards of excavation of all kinds; 5,284 cubic yards of filling in place.

Contract No. 3. Laying Flag Stones, Setting Curb, &c.—At the time Contract No. 1 was executed the Department had not been advised of the legal closing of One Hundred and Twelfth and One Hundred and Thirteenth streets. They have since been closed and are part and parcel of the Park. A contract was entered into

to remove the existing flagging, curbs, etc., and regulate and grade with wholesome earth filling the then existing streets.

The work is now in progress and will be completed shortly; the estimated cost of same is \$4,500 and the work done as follows: 1,800 square feet of old flagging taken up and relaid; 17,700 square feet of new flagging laid; 2,500 cubic yards earth filling in place; 100 linear feet new 5-inch curb set; 1,300 linear feet old curb reset; 1 new receiving basin built.

#### WEST EIGHTY-SIXTH STREET.

Asphalting Roadway, Setting Curb, etc.—A contract for paving with asphalt the roadway of West Eighty-sixth street between Central Park West and Amsterdam avenue was executed; and the work was prosecuted to completion at a cost of \$19,778.04. The money was made available after repeated efforts; and the balance on hand will be sufficient to pave Eighty-sixth street from Amsterdam avenue to Riverside drive, a contract for which has been awarded. The work done follows: 3,301 linear feet of six inch bluestone curb set; 7,319 square yards of granite block pavement taken up and relaid; 7,324 square yards of asphalt roadway pavement with bituminous binder laid.

#### STUYVESANT SQUARE.

Serious defects in the drainage of this park were remedied, as they were the cause of general complaint. An order was issued to do the work and the entire drainage is now in good repair. The work done follows, the cost of which was about \$500: 3 walk basins built complete; 100 linear feet of six-inch new drain pipe furnished and laid; 250 linear feet of old drain pipe, which was found filled solid with silt taken up, cleaned and relaid; 170 square feet of asphalt walk pavement restored, and the sodding of trenches.

#### RIVERSIDE DRIVE.

Resurfacing Roadway Between Seventy-second and One Hundred and Twenty-ninth Streets—Riverside drive from Seventy-second to One Hundred and Twenty-ninth street, not having been resurfaced in years (owing to the lack of funds to properly repair the same), having become considerably worn, and offering at its best but a rough and uneven surface for travel, was resurfaced this year under contracts for furnishing, delivering, &c., shale and trap rock screenings. The shale was spread to various depths, varying from 2 to 5½ inches, over the entire surface of drive and property road and then thoroughly rolled. Trap rock screenings to the depth of about one inch was then rolled in to bond with the under strata of shale and the roadway to-day offers a smooth surface. In this way this greatest of pleasure drives was much improved; the cost of the materials, shale and screenings is \$34,146.90 As the labor of spreading, &c., rolling, sprinkling was furnished by the Park force I

am not in position to state in figures the outlay for same. The work done: 12,513.31 cubic yards of shale spread and rolled; 2,897.33 cubic yards of screenings spread and rolled.

#### RUTGERS PARK.

The rubble masonry wall supporting the granite coping and iron railing surrounding this park was what is known as a rough finished wall, the exterior face showing to the weather for a height of from six inches to two feet. This rough surface was exposed to view. A small construction balance was made available and the entire surface received a cement patent stone finish, trowelled and rubbed down. About 375 running feet of wall was treated in this manner.

#### EAST RIVER PARK.

General repairs were made to the cement walk pavement of esplanade adjacent to sea wall, between Eighty-fourth and Eighty-sixth streets. The work done was the relaying of 500 square feet of walk pavement of Portland cement mortar on concrete base.

#### HUDSON PARK.

##### Repaving Walks, Building Basins and Doing Other Work.

A contract was entered into to pave the existing gravel walks with asphalt on concrete base and rubble stone foundation, to build new drainage system, including regular brick walk basins with silt chambers, to set edging, to spread mould and to lay sod, etc. The contractor began operations in November, and only the work of building basins and laying drain pipe for the purpose of draining the low land and walks will be permitted at this season.

The work done to date is the building of ten walk basins and the laying of 135 feet of drain pipe. The estimated cost of work when completed is \$12,630.

In concluding my report I desire to state that contracts are now in force, and work on same is now being prosecuted as follows:

Viaduct, carrying Riverside drive over Ninety-sixth street.

New York Public Library, contract No. 1, removal of reservoir and building foundations.

New York Public Library, contract No. 2, constructing Fortieth street vault.

New York Public Library, contract No. 3, building library proper.

Sea wall extension East River Park.

Hudson Park, improvement of, asphaltting walk, building drainage system basins, etc.

Jefferson Park, regulating and grading.

Soldiers and Sailors' Monument, construction of.

Soldiers and Sailors' Monument, approaches.

Museum of Art, electric fixtures, etc., electric wiring, painting walls, etc.

Bids were received, and contracts awarded; but work not ordered on, owing to the lateness of the season on the following:

Widening Fifty-ninth street, between Fifth and Eighth avenues.

Paving with asphalt, setting curb, etc., West Eighty-sixth street, from Amsterdam avenue to Riverside drive.

Preparing plots for tree planting in Riverside drive, between Ninety-sixth street and One Hundred and Twenty-fourth street.

Improving park, Port Richmond, Staten Island.

Improving park at Stapleton, Staten Island.

Contract for rock excavation New York Public Library.

In addition to the general field and office work performed by the Engineering force in connection with the above described work, such as preparing the specifications, form of contracts, plans, details, general laying out of same, estimates for payments, &c., this Bureau was engaged as follows:

#### SURVEYS AND PLANS.

For repairs to pavements, &c., Corlears Hook Park.

For restoration of park territory near One Hundred and Tenth street, Lenox avenue, destroyed in construction of Rapid Transit Tunnel.

Of Ryan Park (for record).

Of Hooper Fountain (for record).

Of grounds around Casino, Central Park, for laying out new work and for determination of quantity of excavation in contract for improving said grounds.

Of One Hundred and Tenth street, Fifth to Seventh avenue (Cathedral Parkway Improvement). —

Of Rutgers Park, for improving southerly end.

Of grounds west of public driveway, near One Hundred and Ninety-fifth street for proposed sheds.

Of the northern end of Riverside Park for restoration of work destroyed in construction of Viaduct extension of Riverside drive.

Of grounds adjacent to bear pit, Central Park.

Of property road **Riverside drive, between Ninety-first and Ninety-second streets.**

Of proposed drive approaches to Ninety-sixth Street Viaduct.

Of proposed improvement of Riverside Drive, Bridle Path and Cycle Path between Ninety-seventh and One Hundred and Twentieth streets.

Proposed improvement around the Menagerie.

For proposed alterations to entrance drive at Ninetieth street and Eighth avenue.

The following plans were prepared for submission to the Board of Estimate and Apportionment for funds:

For resurfacing bridle road and cycle path of Riverside drive between Ninety-seventh and One Hundred and Twentieth streets.

For repaving walks in Central Park.

For constructing roadway in Battery Park.

For new curbstones and repaving roadway of Central Park West from car-tracks to curb.

For repaving plaza One Hundred and Tenth street and Fifth avenue.

For paving the esplanade walk adjoining the sea wall in extension of East River Park.

For paving with asphalt and setting curb Seventy-second Street from Central Park West to Riverside Park.

The corps have also been employed on the tabulations of bids for all boroughs, measurement of trucks and scows delivering mould, shale, gravel, screenings, etc.; the testing of cements and other building materials and the inspection of asphalt pavements under guarantee, and general office work.

I remain, respectfully, etc.,

EDWD. A. MILLER, Chief Engineer Department of Parks.

The report of Mr. Julius F. Munckwitz, Jr., as to the work done by the Architectural Bureau follows:

The Architectural Bureau has been engaged during the year in preparing plans and specifications for improving various structures, bridges, &c., and also superintending the work, as follows: A number of improvements have been made to buildings, inclosures, yards, etc., of the Zoological Department. Among these is a snake cage in the easterly end of the monkey house, new wrought iron fences around the yards at the deer house, an ornamental wrought iron inclosure for the rabbit warren, new roofs to the deer house and the cattle sheds, blue stone edging along walks adjoining the cattle yards and eagle cage and a new iron fence around yard of cassowary. All this work has materially improved the appearance of the different yards and buildings. All the above work was done by contract and the cost approximately \$3,668.

Many repairs and alterations to the Claremont Hotel in Riverside Park and the McGown's Pass Tavern in Central Park have been made, such as new steam-heating plants, painting, plumbing, decorating, roofing, etc.

Repairs were made to buildings and bridges as follows: Battery Park music stand, men's toilet in Union Square Cottage, two bridges in Central Park, Lawn Tennis Cottage, stationary seats on Mall, Women's Cottage near Casino. This work was done by contract and cost about \$2,590. A new music stand was built at Abingdon Square at a cost of \$797.00. The old carriage shed used by the Police and standing near the Sheepfold was moved and a new one that cost \$680 was built on another site. The removal of the old house was made necessary by the improvements around the Sheepfold and the construction of a new entrance to the park at Sixty-sixth street and Central Park West.

The work on two buildings and the pavilions in connection with the building of the viaduct at Ninety-sixth street and Riverside drive has been inspected during its execution. A number of contracts for the completion of the Art Museum have been examined and the work inspected while under execution and payments examined.

New office partitions in Arsenal were put up at a cost of \$920.00. The vault in Arsenal in which the maps and drawings are kept had become so filled with different things that did not properly belong there that a thorough overhauling and classification of all drawings became necessary. New cases and cubes for the drawings and maps have been supplied and the indexing and cataloguing is now well advanced. When finished a complete record of all drawings will be available for reference.

The Soldiers and Sailors' Memorial Arch, now being erected on Riverside Park and Eighty-ninth street, is under the supervision of a commission created for that purpose, but the immediate responsibility for overseeing the work and auditing the accounts has been placed on this Department. The monument proper is nearly completed and about one-half of the esplanade is finished. A contract for \$59,400 for building the north and south approaches has been executed and the work will probably be begun next spring.

The question of improving the sanitary conditions of the public toilets in the various parks has received considerable attention during the year, and I quote from my report on this matter. "The sanitary condition of many of the cottages and places which are used for toilets are exceedingly bad and ought not to be tolerated, nor is it right that the public should be permitted to use them. An examination of these places reveals the fact that repairs cannot remedy all the evils. Every park throughout the city should have a separate building or toilet for men and for women. I have included in my estimate the cost of putting up such additional structures in the parks to provide for this demand." In this report the necessity for rebuilding Bank Rock Bridge was also dwelt on and the whole matter was laid before the Board of Estimate and Apportionment with request that the necessary bonds be issued to

carry out these improvements. This was done, and plans are being prepared to build these much-needed toilets. The location and estimated cost of the buildings, &c., is shown in the following detailed statement:

Central Park—

Bank Rock Bridge, No. 10, located east of West Drive, near Seventy-seventh street, over inlet of lake, to be rebuilt.....	\$5,000 00
Men's cottage No. 29, in Ramble, to be taken down and replaced with new one.....	4,000 00
Men's toilet and cottage for storing and keeping small sailboats, Conservatory Lake; present building to be removed and new one built.	2,500 00
Lawn tennis cottage and women's toilet; new building to be erected.	6,000 00

Battery Park—

A new building for men to be erected.....	6,500 00
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Washington Square—

A new cottage for men to be erected.....	6,000 00
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Stuyvesant Square—

Cottage for men to be erected in the easterly park.....	4,500 00
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Madison Square—

Present cottage should be extended on one side for men's toilet....	4,000 00
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Bryant Park—

New building to be erected for men.....	6,000 00
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\$44,500 00

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Office of Landscape Gardener.

Hon. George C. Clausen, Commissioner of Parks, Boroughs of Manhattan and Richmond.

Sir—I herewith submit a report of work done under my immediate supervision during the year 1901 in the parks of the boroughs of Manhattan and Richmond.

The work commenced during the previous year in Riverside Park was carried on and completed as far as One Hundred and Twenty-second street. The new plantations laid out during the past summer extend from One Hundred and Eighth street to Claremont Hotel, but there still remains some planting to be done around Grant's Tomb and on the steep slopes west of the westerly drive and north of One Hundred and Twenty-second street. About sixteen thousand trees, shrubs and vines were received in the spring and fall, of which the greater part were used for

planting. There are, however, a number of plants reserved for after planting, some of which are heeled in at the Nursery in Riverside Park just north of Ninety-sixth street and the remainder planted out in the Nursery in Central Park near Eighth avenue and Sixty-sixth street. There are therefore on hand in the two nurseries mentioned sufficient trees and shrubs to complete the plantations in Riverside Park, or very nearly so.

The rough ground west of Grant's Tomb on the steep slopes partly covered with wood was graded and sodded. The wood which constitutes a very slight remnant of the primitive vegetation of Riverside Park was preserved as nearly as possible in a natural state.

South of Claremont Hotel the unsightly stables were removed and a small flower garden was laid out nearer the building. Over one acre of ground was laid out in sod on the site of the old stable and its approaches. The little garden became quite popular and forms a centre of interest in that part of the park.

The lawns above One Hundred and Eighth street were renovated, cleaned and regraded to a large extent. The plantations in the whole of the park were cultivated and developed rapidly, so that a marvelous transformation is likely to take place within a few years, if the work is carried out on rational and economical lines. In many parts of the park the shrubberies are already effective from an ornamental point of view, and begin to furnish shade and shelter.

The routine work of watering, pruning, cultivating, cleaning, mowing and removal of grass and refuse was carried on as usual and on as economic lines as possible.

A new entrance without steps was made at One Hundred and Sixth street, so that the park is now accessible to mothers with young children. Before this entrance was made there was no such entrance north of Ninety-sixth street.

Considerable destruction took place during the summer months, owing to the neglect of the police authorities, so that it was no uncommon sight to see hundreds of persons picnicking in the young shrubberies and hanging clothes and baskets on the young trees, which were broken down in many instances and had to be replaced during the fall. The loss of newly-planted trees and shrubs from natural causes was inconsiderable.

Some construction work was also carried on in various other parks. The small plot of ground at One Hundred and Fifty-fifth street and Edgecombe avenue was filled in, graded, sodded and fenced at small cost to the Department, as all the mould and filling was obtained free of charge. Considerable other undeveloped ground was also filled with mould and loam obtained free of cost to the Department, viz.: The most southern part of Highbridge Park, as far as One Hundred and Fifty-eighth street; Empire Park, the hollow and unhealthy ground in Manhattan Square north-



west of the Museum (not yet completed), and the undeveloped ground south of the Conservatory.

This large tract of land was graded and laid out according to plans prepared in connection with the Conservatory. A considerable amount of mould was put in by contract at very low cost (eighty-nine cents per cubic yard), and the whole area manured, spaded and seeded, so that a very small outlay for asphalt will complete the improvements south of the Conservatory grounds. The approaches planned in connection with the Conservatory could not be carried out, as the appropriation was not passed on by the Municipal Assembly.

The work of resodding worn edges and borders of walls in the parks of Manhattan and Richmond was done by the contractor in a satisfactory manner, so that the parks were in an unusually good condition as early in the season as the first day of May.

Much of this was subsequently destroyed because of the unjustifiable suspension of the park rules by the police authorities, so that not only were newly seeded lawns trampled down, but even the flower borders were trampled to pieces and persons were seen to lie down unmolested among the choicest flowers of the park. This inactivity on the part of the police also resulted in considerable destruction of shrubberies and the appearance of unsightly paths across the lawns in various parts of the park.

An attempt was made late in the fall to repair, as much as possible, such defects and a large quantity of manure was carted to the weakest lawns, shrubberies and embankments.

Early in the season Mount Morris, Morningside Park, Madison Square and large tracts in Central Park were covered with manure and many bare embankments and other places were seeded with suitable varieties of grass seed.

In the Ramble, Central Park, the work of beautifying this natural garden was carried on on the lines laid down during the two preceding years. About 600 rhododendron maximus, of large size, were added to the collection of evergreens, all of which succeeded admirably and formed buds which will flower in the spring of 1902. The colonies of wild flowers, corydalis, ornithogalens and bulbs of various kinds were largely increased, so that hardly any bare ground remains in the Ramble outside of the promontory, which was greatly abused by careless visitors. Hundreds of azalea mollis were also planted in the Ramble, and will, in a few years, make fine displays in early summer.

A number of evergreen trees were planted in various places in Central Park and succeeded tolerably well, although the hot spell in the summer was very hard on newly planted evergreens.

The usual routine work of pruning, removing dead wood, cleaning, destroying insects, curing diseases, watering and cultivating, as well as the care of floral display, was attended to as usual.

There were very beautiful floral displays in the parks during the early part of May and June. A number of narcissuses and daffodils were introduced in the fall of 1900, all of which flowered beautifully, forming one continuous mass of flowers on the east side along the drive from Eighty-sixth to One Hundred and Second street, and north of McGowan's Pass Tavern to the bridge near the Harlem Meer, as well as throughout the Ramble and north of the South Drive near Fifty-ninth street. The number of wild flowers and bulbs planted during the fall of the present year will undoubtedly make the park extremely beautiful during the months of May and June of 1902, as well as ever afterwards, as these plantations will be permanent with very moderate care.

A number of shrubberies have also been renovated in the Central and City parks and new shrubberies have been planted in connection with the new work at the Casino, the Sheepfold and south of the Conservatory.

Two-rail fences to protect borders of lawns, in all 4,000 linear feet, were put in in Central Park, and 1,500 linear feet of wire mesh fences were put in in various city parks, to protect statuary, floral displays and lawns in small parks. Two and three rail fences were also put in in Riverside Park to protect the public from stepping from the walks over steep embankments. Hancock Square was enclosed by a picket fence and wholly renovated. Empire Park at Sixty-third street and Broadway was also fenced and renovated. Existing fences were cleaned and repainted throughout, as far as possible.

The Entomologist was steadily engaged throughout the year cleaning and spraying such trees as are generally subject to insect pests. The parks were visited by unusual numbers of Tussock moths, which ravaged many trees, especially in the city parks and on the avenues not under the care of the Department of Parks. As the female of the Tussock moth is wingless and cannot fly it is clear that the pests were bred in the borough, but the fact that many trees in the neighborhood of the parks are allowed to harbor insects explains why the parks cannot be kept wholly free from insects like this. Unusual care was taken during the present summer to destroy all cocoons of this moth as soon as they appeared on the trunks. Many extra workmen were put on this work late in the summer, and as the gardeners in pruning are doing their best to clean all infected trees, it is hoped that very few Tussock moths will be found in the parks during the summer of 1902.

The spring and summer display in formal flower beds were generally good. A large number of plants were stolen and carried away from the parks, to the great detriment of the flower beds. An endeavor was made to discourage this tendency by planting very strong and robust plants exclusively. No carpet bedding was there-

fore attempted as in previous years, but the displays consisted chiefly of Cannas, Geraniums, Begonias and similar flowering plants. These displays were very successful in Central Park, Manhattan Square and other protected parks and in the city parks where the flower beds were enclosed by wire mesh fences. In all 45,000 plants were raised and used for spring bedding and 205,000 plants were raised for summer display, of which number 125,000 were planted out and the remainder kept for stock. The flower garden north of the Conservatory was planted with palms and other handsome foliage plants, as well as with the choicest of flowering plants, and was greatly admired as a promenade.

The fountains were generally replanted with water lilies and other aquatic plants. There is no aquatic house where such plants can be raised, and such a house should be built in order to make the floral display of the city's fountains more and more attractive and interesting during the summer months.

A large quantity of herbaceous plants was raised in the nursery at Sixty-sixth street and Central Park West, some of which were planted out in beds and borders in the fall. There are now on hand in the nursery 26,100 herbaceous plants, 40,000 pansies and daisies and 2,500 trees and shrubs.

There are also at the Conservatory, on hand for use next spring, 35,000 pansies and daisies and nearly 100,000 bedding plants of various kinds, including dormant bulbs and tubers.

Among new and important improvements in Central Park may be mentioned the new entrance at Sixty-sixth street and Eighth avenue. The unsightly sheds and the large dumping ground at this place were done away with and the improved ground was laid out in keeping with the rest of the park. Some minor work is still to be done in connection with this improvement.

The construction and completion of the Conservatory was almost wholly suspended for lack of funds. A retaining wall and flight of steps were constructed on the southeast corner of the Conservatory. An additional boiler was put in at the Conservatory, as it was found that the two boilers formerly used for heating the whole system were considerably strained in very cold weather. The heating system is now perfect and very economical.

The Conservatory was repainted where necessary and the buildings are now in a very satisfactory condition.

The exhibitions, or Flower Shows, in the Conservatory were very popular. The Chrysanthemum exhibit was finer and more complete than before, and was visited by no less than 330,000 persons during the month of November. The total number of visitors to the Conservatory during the year exceeded 1,400,000 persons. As this institution paid for all running expenses, as well as interest on the capital expended on its construction, by producing all the bedding plants required for out-door display in the Borough of Manhattan, it will be seen that the flower shows were furnished absolutely

free of cost to the city. The establishment, therefore, deserves every encouragement, and additional facilities for growing a still more varied collection of flowers, including aquatic plants, should be furnished without too much delay. Such additions should, however, be made in conformity with the original plans.

The Casino in Central Park was thoroughly overhauled and renovated. The old building was insanitary and in many places dangerous to the public. It has now been made very nearly fireproof. There are new and handsome toilet rooms, a large dining hall, surrounded by an inclosed veranda, under which is placed the large new kitchen. New heating and lighting features were also put in, and the building is now modern and practical in its appointments.

A new approach to the Casino was also constructed under my supervision and the surrounding ground was generally renovated and planted with new shrubberies.

The work in the office of design consisted of furnishing the plans for Seward, Jefferson and the Staten Island parks, and numerous plans for minor parks, plantations and improvements, as well as working plans and specifications for such work as was carried out under my direct supervision. Respectfully,

N. JOUSSON ROSE, Landscape Gardener.

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Office of General Foreman.

Hon. GEORGE C. CLAUSEN, Commissioner of Parks, Boroughs of Manhattan and Richmond:

Sir—I desire to submit herewith a brief account of the work performed under my supervision during the year 1901.

In the various parks the routine work incident to the seasons was attended to. During the winter months special efforts were made to clean the walks of snow and ice as soon after storms as possible. In this work the record of previous years was fully lived up to and the necessities of the public were met.

The driveway of Riverside, except a portion immediately north and south of Ninety-sixth street; the roadway of West Seventy-second street and the drives of Central Park were repaired with shale and stone screenings, about 13,000 cubic yards of material being used on the work.

The bridle paths of Central Park and Riverside Park were cleaned, harrowed and kept in good condition.

In Central Park the cottages were kept open during the winter months from 8 A. M. to 5 P. M. and during the balance of the year from 6 A. M. until 10 P. M.

During the winter and early part of 1901 advantage was taken of the low water in the park lakes to clean the shores, thus adding greatly to the healthful conditions of the park during the spring and summer months.

The usual preparations were made for skating, such as erection of buildings, platforms, etc., but owing to the mild winter it was not possible to open the lakes for skating.

The road of the Harlem River Driveway was repaired with screenings and loam.

During the year there were removed to the various dumps of the Department of Street Cleaning from the parks in the Borough of Manhattan 4,904 loads of refuse, etc.

During the first quarter of the year the average time of the working force was four days per week; full time was resumed in the spring and continued until about December 1.

The mechanical forces were engaged as follows: The carpenters in the repairs of the various cottages, buildings, bridges and other structures, rolling stock, etc. The skate buildings and platforms were put up by this force for skating last winter; were removed in the spring, and are now being erected for this season's use. This force also repaired and delivered settees as follows:

Central Park, 1,660 settees; City Park, 1,371 settees; Harlem river driveway, 145 settees; Staten Island parks, 50 settees; total 3,176 settees.

The painters were engaged in painting on repairs made by carpenters as well as several cottages in Central Park and the various pieces of rolling stock, painting of settees, etc.; the masons were engaged in repairs of the walk basins, fountain basins, drainage, etc.; the steam engineers and machinists were engaged in the operation and repair of the steam heating plant at the Arsenal and the engine at the shops, as well as the various needs for repair of iron work throughout the department; the plumbers and other mechanics were engaged in the work incident to their trades at the various seasons of the year.

During the second quarter of 1901, the lawns were opened for children's picnic parties and for the playing of games.

Permits for children's picnic parties were issued as follows:

Central Park.	Number of Persons.
Ball Ground.....	32,965
East Green.....	22,168
Ramble .....	1,087
Peacock Lawn.....	2,394
Lawn N. of Art Museum.....	8,633
North Meadow.....	49,515

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120,262

Mount Morris.....	9,833	
Battery Park.....	1,000	
Jeannette Park.....	500	
	<hr/>	131,945
During July and balance of summer.....		5,000
		<hr/>
		136,945
		<hr/> <hr/>

During the year the following number of permits were issued for games:

Tennis, 1,050; croquet, 542; football, 316.

The following number of other permits were also issued:

Carting on roadways of Central Park, Riverside and parkways, 601; photographing and sketching, 1,174; picking dandelions, 75; storing of miniature yachts in house at Conservatory Lake, 267; examination of trees and shrubs, 4; examination of mycological specimens, 4; for passing over lawns for the study of birds and their habits, 4.

In connection with the tennis playing 192 courts were marked out and kept in proper condition for that game; the lawns used for croquet playing were also kept in condition. The large number of children making use of the lawns during the spring and summer greatly enhanced the work, which, however, received proper attention.

The concert season of 1901 commenced on June 3rd. The usual preparations were made for these concerts, such as calcium lights, arrangement of settees, furnishing ice water, etc.

Concerts were given as follows:—Monday evenings, Corlears Hook Park, thirteen concerts; Monday evenings, Washington Square, thirteen concerts; Tuesday evenings, Mount Morris Park, thirteen concerts; Tuesday evenings, Tompkins Square, fourteen concerts; Wednesday evenings, Abingdon Square, twelve concerts; Wednesday evenings, Mulberry Bend Park, fourteen concerts; Thursday evenings, Madison Square, twelve concerts; Thursday evenings, Hudson Park, twelve concerts; Thursday evenings, East River Park, fourteen concerts; Friday evenings, Battery Park, thirteen concerts; Saturday afternoons, Seward Park, thirteen concerts; Saturday afternoons, Central Park, thirty concerts; Sunday afternoons, Central Park, thirty concerts.

Respectfully,

P. W. ST. JOHN,  
General Foreman.

## REPORT OF ENTOMOLOGIST

For the Year Ending December 31, 1901.

HON. GEORGE C. CLAUSEN, President Department of Parks:

DEAR SIR—The following is a report of work done in the Entomological Department for the year 1901:

In the large parks of New York City there is a great variety of foliage, and therefore numerous species of parasitic insects and fungi find congenial habitat and the proper food for the perpetuation of their species.

We have now working upon the vegetation of our parks nearly "two thousand" species of noxious insects, each species representing myriads in numbers.

New York City being a great importing centre, new insects are being introduced in many imported products from other countries.

We are now suffering from many of the introduced species, the Elm Beetle, Leopard Moth and Scale insects being among those most destructive.

The Wood Leopard Moth, introduced here about twenty years ago, has spread to many towns and cities about New York, and is one of the most destructive insects we have to contend with.

The Elm Beetle has been very destructive to elms of all species, and the most persistent watchfulness is required to keep it in subjection.

The Tussock Moth, which increases so rapidly and is everywhere present, gives this department more work to keep them in subjection than any insect we have to contend with, for the trees must be cleaned of egg masses and cocoons during the winter and the foliage must be sprayed with insecticides during the summer to prevent their defoliating the shade and ornamental trees.

The Bag Worm also requires attention in the removal of the cases and spraying for their destruction during the summer.

The Maple Pulvinria is always more or less abundant every year, and have to be sprayed with an emulsion prepared for their destruction.

All the White Pines in the parks are affected with Chermes, and have to be sprayed for their destruction and removal.

Scale Insects, that are so small and abundant, are among the worst enemies to our shade trees. They are so small as to readily escape notice, and so abundant that they often cover the entire tree and completely destroy it.

The Larvæ of Vanessa are very abundant often, on the poplars and willows, and where groups of these plants are placed they often defoliate the entire plantation unless destroyed.

Tent Caterpillars are very abundant over the entire park system, and at certain times of the year a large force of men is required to keep them in subjection. Often as many as thirty nests may be found on one tree. In this work the gardeners have greatly assisted this department.

The Datanas are every year very abundant and destroy the foliage of the hickories and walnuts, and as many as fifteen pounds of caterpillars have been taken from a single tree.

Woodborers in great variety work in the duramen and cambium loser of many of our trees, and each year we are obliged to submit to losses from this source.

Hundreds of different species of leaf-eaters, as Leaf Skeletonizers, Leaf Rollers and Leaf Miners and other small insects that feed upon the porenchyma of the leaf, go to make up a formidable host to contend with, and which have to be treated with emulsions prepared for their destruction.

Plant Lice in myriads are present on a great variety of plants, and all have to be treated in order to keep them in subjection.

Fungi, one of the most destructive agents we have for breaking up and destroying plant structure, is everywhere abundant, and it is due to this parasite, rather than to insects, that many of the trees in our down-town parks look so shabby early in the season.

About three months of the year is given to spraying for fungi alone, and good results have been obtained and many valuable trees saved.

With the insects, during the winter all the cocoons and egg masses are removed and destroyed by burning, and in summer the trees are sprayed with London Purple, arsenate of lead, Paris green, kerosene and soap emulsions and other preparations as the cases require.

The only successful means of keeping the myriads of insects that infest our parks in check is to destroy them while they are in their first stages of growth. In this way we have been able to keep the parks in good condition, save where there is not sufficient help to handle them, or a protracted rain removes the poison from the trees, as was the case the past summer. A rain of nearly ten days gave the caterpillars an opportunity to continue feeding, and the increase was enormous in a short period.

With the trees properly cleaned in the winter, and the proper assistance being given at such seasons as they are very abundant, the trees, shrubs and plants of our parks can be kept in the best condition.

Following is the number of days worked in each park of the city during the past year, together with abstracts of work done:



## NUMBER OF DAYS WORKED IN EACH PARK.

The work of removing cocoons, egg masses, webs, Scale insects, Sphides and spraying the trees for insect and fungus parasites in the Central Park. Number of days, 101.

The trees in Madison Square have been treated for the Tussock Moth, Wood Leopard Moth, Scale insects and plant lice, and also for parasitic fungi. Number of days, 39.

Union Square has been treated for the Tussock Moth and Scale insects and sprayed for the destruction of fungi. Number of days, 17.

City Hall Park has been given the usual care in the removal of cocoons and egg masses, spraying for leaf-eating insects and fungi. Number of days, 29.

Battery Park has been treated for Scale insects, the Tussock Moth, the Elm Borer and sprayed for leaf-eating insects and fungi. Number of days, 27.

Tompkins Square has been cleaned of cocoons and egg masses, and sprayed for leaf-eating insects and fungi. Number of days, 23.

Bryant Park has been cleaned of cocoons and egg masses and sprayed for leaf-eating insects and fungi. Number of days, 26.

Washington Square Park has been cleaned as were the others, and the trees sprayed with insecticides and fungicide. Number of days, 18.

Riverside Park has been given the same care as in other parks in the removal of cocoons and spraying for Scale insects, the Elm Beetle and the Tussock Moth and fungi. Number of days, 6.

Mount Morris Park has been given as much time as could be for the removal of cocoons and spraying for insects and fungi. Number of days, 5.

The trees on West End avenue were cleaned of egg masses and cocoons. Number of days, 3.

Eighth avenue and Eighty-sixth street, all the trees on the avenue and street were cleaned and treated for insects and fungi. Number of days, 2.

Stuyvesant Square was given the usual attention, and the trees cleaned of cocoons and egg masses. Number of days, 1.

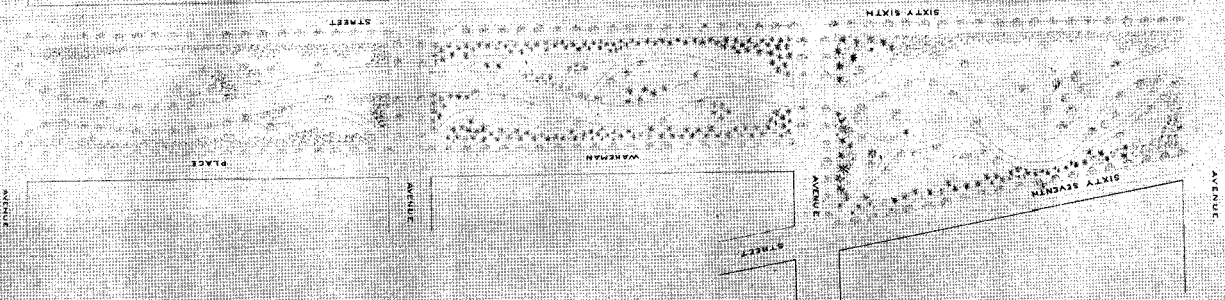
All the small parks, squares and places have been given the usual care and attention, and two days were spent on Staten Island. Number of days, 6.

Respectfully submitted,

EDMUND B. SOUTHWICK, Entomologist D. P.

**BAY RIDGE PARKWAY**  
FIRST AVENUE TO FOURTH AVENUE  
BROOKLYN, N.Y.

City of New York  
Department of Parks  
Borough of Manhattan  
Division of Recreation



## BOROUGHs OF BROOKLYN AND QUEENS.

Office of the Department of Parks,  
Boroughs of Brooklyn and Queens,  
December 31, 1901.

HON. ROBERT A. VAN WYCK, Mayor of the City of New York:

Sir—I herewith submit my fourth annual report as Commissioner of the Department of Parks of the boroughs of Brooklyn and Queens.

One of the principal improvements carried on during my administration was the extension of the Bay Ridge parkway, or Shore drive. This improvement has also been referred to in my previous reports. I inclose herewith a photograph of the improvement, from Fourth avenue to the present Shore road. This improvement is a very important one, as it will form a connection between Fort Hamilton avenue and the Shore road at First avenue, a distance of about one and a quarter miles. A forty-foot roadway has been completed from Fourth avenue to the Shore road, winding in graceful curves between Sixty-sixth and Sixty-seventh streets, and artistic bridges or archways have been erected at Second and Third avenues to carry all the street traffic and permit the driveway to be unobstructed by any crossing from Fourth avenue to the Shore road.

In addition to the work already completed, a contract has been entered into for a walk for pedestrians, to be laid with hexagonal asphalt tiles, for the entire distance of the improvement, and arrangements have been made for the purchase of trees and shrubs for planting on the parkway in the early spring. Ten thousand cubic yards of top soil and top dressing, as well as a number of large boulders for the embankment, have been contracted for, and the work when completed will be artistic and of great benefit to all parts of the city as well as to the people of Bay Ridge.

All of the work, excepting the roadway and the arches, will be paid for out of money saved from the amount appropriated for the maintenance of the parks and parkways during the year 1901.

Proceedings are pending for the opening of Sixty-seventh street, from Fourth avenue to Fort Hamilton avenue, the same to be paved with macadam when opened, and the eastern border to be planted with trees and shrubs. This will make a complete connection and drive, at an expense of about one hundred thousand dollars, which will be a saving to the City of about three million four hundred thousand dollars from the estimate made by the architects for the former Shore Drive Commission.

The Department has also greatly improved Highland Park, having extended the drive and made a contract for the construction of a rustic stone arch, at a cost of about twelve thousand dollars. When completed this will afford an opportunity for pleasure drivers to pass through the woodlands of the park. This improvement will also be

made from money saved out of the maintenance fund of the Department for the past year.

The details of the other work of the Department will be found in the accompanying report of the Landscape Architect and the Superintendent of Parks, and the finances of the Department are covered by the reports of the Secretary and Chief Clerk. A report of the Captain of Police of the Seventy-third Precinct (Prospect Park) is also appended.

*Charter Revision Committee*

There are many suggestions which I might make on account of my nine years' experience as Commissioner of the Department of Parks for the boroughs of Brooklyn and Queens, but it would seem to be almost useless to present them here, or until the parks are taken out of politics, and the pleasure grounds of the people are protected from the constant changes made necessary by the new Charter, as it is utterly impossible for any Commissioner either to complete or have the experience necessary to make the needed improvements, involving the expenditure of money and time necessary to do justice to the best interests of the community.

This City, which has the largest area of parks of any in the country, and which were purchased and improved at a great expense, is, I believe, the only one whose Park Department is subject to political changes.

Thanking you for the great honor conferred upon me by my selection to act as Commissioner of Parks for the past four years, I remain,

Respectfully yours,

GEO. V. BROWER, Commissioner.

#### NOTE.

I expected to be able to furnish you with the photograph of the improvement of the Bay Ridge Parkway, as referred to in my report, but the same has been delayed. I have, however, given instructions to have it sent so that it can form a part of my report.

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Office of the Department of Parks,  
Boroughs of Brooklyn and Queens,  
Litchfield Mansion, Prospect Park, Brooklyn, December 31, 1901.

Hon. GEORGE V. BROWER, Commissioner, Department of Parks, Boroughs of Brooklyn and Queens:

Sir—The following report submits for your consideration the work done on the park system during the year 1901.

The seasons have been generally favorable for park work, and timely rains kept the grass and other vegetation in good condition nearly the whole summer. The alter-

nate severe freezing and thawing that took place in the early part of the year, and continued into the beginning of spring, severely injured many rare evergreen trees and tender shrubs, and a plague of insects on the trees gave great trouble during the last months of the warm weather.

The work on the outside parks and boulevards was continued throughout the year, they having at all times been kept in a presentable condition for the use of the people.

A great many minor improvements have been made throughout the entire park system, such as grading, sodding and the renewal of missing trees, and this work, covering many miles of territory, has involved an immense amount of labor not apparent to the casual observer.

After a long period of fine working days in the autumn, the early advent of severe weather interrupted the work of grading, rolling and repairing the drives and the construction and resurfacing of asphalt walks, all of which it was hoped to finish this year.

Prospect Park—The regular routine of care and maintenance has gone on in the usual manner, the repairs to buildings, implements and vehicles being extensive. The care of the animals and birds has occupied much time, the menagerie having materially increased during the year. The ever-increasing crowds of people who frequent Prospect Park greatly add to the wear and friction upon the park property, and render more and more attention necessary to keep the same in a presentable condition.

Bronze Statuary—The two allegorical groups designed by Frederick MacMonnies for the south side of the Soldiers and Sailors' Memorial Arch have been received and put in place, as have also the bronze spheres and birds on the four granite columns at the Prospect Park entrance.

The Flower Gardens—New designs for the flower-beds were prepared and executed, this work requiring over 350,000 bedding plants, besides a large number of tropical species from the greenhouses. "Scarlet Island," being planted with a mass of scarlet flowers, was universally admired, as were also the flowering cacti, which bloomed profusely. In the fall designs were prepared and planted with over 125,000 tulip, hyacinth and other bulbs, for spring flowering. The old-fashioned Flower Garden on Breeze Hill, being planted with herbaceous perennials, became much overcrowded, owing to their vigorous growth, the stronger varieties destroying the more delicate ones. An extensive thinning out was given the beds the latter part of the summer, and the work of restoration and replanting with finer and more delicate specimens progressed favorably. The Rose Garden displayed its usual profusion of bloom early in the summer, and continued very attractive until the last roses were destroyed by frost. The Water Garden was planted with more than the usual variety of aquatics, and while those native to the temperate zones exceeded in bloom any former year, the tropical varieties did not find the cooler nights as congenial as in hotter summers.

**The Greenhouses**—The new Palm House has been arranged as a tropical **glen, with a stream of water from a cascade running through the centre.** Most of the palm trees are planted naturally in the soil, allowing them an opportunity for more beautiful development and natural growth, while giving a more graceful arrangement. This also accommodates a larger number of plants. The accompanying rock and cement work involved much additional labor, all of which was performed by employees of the Department, and the results have been highly approved by the thousands of visitors and favorably criticised by horticulturists and artists. In addition to the regular greenhouse work, several thousands of chrysanthemum plants and many primroses, pansies, cinerarias and calceolarias were raised for fall and winter exhibitions. The chrysanthemum show commenced about November first, and its popularity was undiminished. The flower shows have been continued until the present time, being varied weekly with new plants and arrangements, and thousands of visitors have attested to their popularity. The new Cactus House (adjoining the Palm House), which was built by park employees, proved a popular feature, with its varied collection of fine plants, which can now be examined during the cooler months even better than in the summer.

**Trees and Shrubbery**—The trees and shrubbery received careful attention throughout the year, dead and diseased trees being taken out and pruning continued as the weather permitted. A large amount of worthless shrubbery that interfered with some of the park views was removed, the trees and shrubs were thoroughly cleaned and sprayed with insecticide, and about three thousand new shrubs and evergreens have been planted in Prospect Park. The restoration of the "Evergreen Walk" was continued by clearing away crowding and deciduous growth, which allows for the development of the rare evergreens. It is desirable to increase the beauty of this winter walk by the further addition of choice specimens.

**Lawns, Meadows and Plantations**—The lawns, meadows and plantations in the park, covering an area of about eighty acres, have all been carefully maintained. The weeds have been removed, holes filled in and grass seed sown in bare places. Sods have been planted where necessary, and the grass has been cut and the borders trimmed from time to time. Over 2,500 cubic yards of composted fertilizer were received and spread on the parks during the early spring.

**Fifteenth Street Circle**—This recent addition to the finished portion of Prospect Park has received careful attention, the lawns being watered and otherwise cared for. Beds of hydrangeas were planted in the centres, and a hedge of *Barberis Thunbergii* was set along the inner side of the drive. The repairs on Ninth avenue, adjacent to this circle (which consisted of grading and resurfacing the sidewalk and preparing grass borders along the curb), were commenced in the early fall, and the work was continued until it had to be stopped by cold weather.

**Drives and Bridle Paths**—The West drive in Prospect Park, from the Fifteenth street entrance to the Ocean parkway entrance, was picked up by steam



rollers and thoroughly remade with Hudson River gravel. The other drives in the park have all received careful attention, the bad places being picked up and filled in with gravel. The bridle paths have all been harrowed, raked over and the stones removed, from time to time. With the beginning of winter weather it was found necessary to discontinue the work on the drives, as well as the greater part of the other outdoor work in the parks.

East Side Lands (Institute Gardens)—The work on the East Side lands has been carried on throughout the year, 30,893 cubic yards of soil having been received for the construction of the mounds. In the propagating houses on these lands the small force of men detailed there have been kept busy in propagating the thousands of bedding plants required for use in the various parks throughout the two boroughs.

Parade Grounds—The Parade Grounds have been maintained in good condition throughout the year for the thousands of persons who use them for baseball, football and other games. The holes were filled in, bare places sown with grass seed and mown from time to time, as required. The unusually luxuriant growth of grass this year entailed much additional labor in mowing. One hundred and fifty tons of unleached wood ashes were received and spread on the grounds. Probably in no city in the world will be found more opportunities for the outdoor enjoyment of the people than in the Borough of Brooklyn. Here it seems possible for people of all temperaments and tastes to find congenial diversion. Besides the flower shows, gardens and other attractions common to the parks of other cities, the people of Brooklyn are afforded opportunities for playing polo, football, baseball, golf and other games, and for skating, boating, riding, driving, bicycling and the speeding of horses. They also have the privilege of listening to excellent outdoor concerts, and it has been customary for the Department for many years past to provide stands and conveniences for parades, anniversaries, races and concerts that have no direct connection with the Department, such as a stand for the automobile races on the Ocean Parkway in November, a stand for the use of the reviewing party on Decoration Day and a stand for the concert given by the United German Singers of Brooklyn in Prospect Park in October. The Department also constructed stands in Prospect Park, Carroll Park and at Leonard and Meserole streets, for the Anniversary Day parade of the Brooklyn Sunday School Union; a stand at the Martyrs' Tomb at Fort Greene, for exercises on Memorial Sunday; a stand at Red Hook Park for a concert given on the opening of the park to the public; stands at Flushing and Jamaica Parks for concerts on July Fourth, and a stand on the Prospect Park Plaza for the Decoration Day exercises.

Other Mechanical Work—The following work was accomplished by the mechanical force of the Department: A new platform and stairway were constructed at Fort Hamilton Park; a new rustic bridge near the swan boat lake in Prospect Park; a gondola boat and cement walks at the Bear Cage; one hundred trusses, sixty-five picnic tables and six animal cages were built; a shed at the Department gravel pit was



constructed; a propagating house, eighteen by ninety-eight feet, was built on the East Side lands; a comfort house was built at Red Hook Park; cement walks were laid around the Picnic Shelter; a portable tool house, for the use of the engineers, twelve by twenty-four feet, was constructed; a new floor was laid in the basement of the Carousal building; four stone boats and six tool boxes were built; a new fence was erected around the Deer Paddock; a Cactus House and a new entrance to the Palm House were built; a toilet building was constructed at the Palm House; a new walk, leading to Highland Park, was laid on Miller avenue; a new Bear Cage, twenty-three by eight feet, was built, and fifty danger signs and one hundred tree stakes were made. The following repairs were also made by the mechanical force of the Department: The rustic arbors at Fort Greene were repaired where necessary; interior repairs were made in the Flower Garden Shelter and the horse sheds adjoining the same were resingled; the Boat House was repaired, and one thousand linear feet of boat runs constructed; seven hundred settees, the platform at the Swan Boat lake, the comfort house and large open shelter at Coney Island, the picket fence along Ocean and Fort Hamilton avenues, eight sprinkling trucks, four buggies, and lockers, doors, windows and steps at the Parade Ground Shelter were all repaired and put in order; the rustic shelter at the Ocean parkway entrance was repaired, as were also the comfort houses, fountains and hydrants at the Lake House, the Flower Garden, Picnic Shelter, Fort Greene Park, Tompkins Park, Winthrop Park, City Park, Carroll Park, Long Island City Park, Flushing, Coney Island and City Hall Parks, and on the Ocean and Eastern parkways.

In addition to the above, general repairs were made to the various park implements, tools, etc., as required throughout the year.

The Outside Parks—All of the smaller parks, including Tompkins, Fort Greene, City, City Hall, Columbia Heights, Bedford, Carroll, Cooper, Bensonhurst, Winthrop, Cuyler, Bushwick, Municipal, Zindel, Underhill, Stuyvesant, Cooper Gore, Woodpoint, Jamaica, Long Island City, Flushing, Saratoga and Irving Squares, and several unnamed small gores, have been carefully maintained throughout the year. The walks, gutters and shelters have been regularly cleaned, the fountains and plumbing kept in order, the fences painted, the lawns cut from time to time and their borders trimmed; grass seed was sown in bare places, and over three thousand cubic yards of composted fertilizer were received and spread on the various parks during the early spring. The trees and shrubbery were trimmed and pruned, and brushed and sprayed with insecticide to destroy the various insects that prey upon them. All the flower beds were dug over and planted with flowers at various times, so as to keep a continual display until the frost set in, when they were renewed and planted with early flowering bulbs.

All the iron fences and bridges in the above-mentioned parks were painted, under contract.

Red Hook Park—With the completion of the new comfort house and the paving of the adjacent walks, the construction work of this park was virtually completed. Over one thousand trees and shrubs were carefully planted, but, unfortunately, this park being without proper protection after working hours, a large proportion of them were destroyed. During the extremely hot weather of summer the small children who throng this park were allowed to wade and bathe their feet in the water of the small fountain, to their great delight and benefit to health and comfort. With the crowds of people who pass over the unfenced walks of this park, no damage has been done to the grass borders, showing that the design is a good one, from the utilitarian as well as the esthetic point of view. Red Hook Park was officially opened, with appropriate ceremonies, on June 15th, although the public have been allowed to use it from the time the walks were in a passable condition.

Fort Hamilton Park—Pending the execution of the elaborate plan proposed for this park, the expense of which renders it impracticable at the present time, this park has been laid out in a simple manner, to fit it for the use of the people. The unsightly objects once covering the ground have all been removed, the surface carefully graded and covered with garden mold, and it already presents a fine lawn. A double row of tulip trees have been planted along the sides of the bordering walks, and benches have been placed in the park for the use of visitors. A new drinking fountain for men and horses is much needed. An interesting object to visitors is the twenty-inch Parrott gun, which was presented to the Department by the United States War Department, and is now in place, accompanied by fifty of the large projectiles cast for it. This relic is the only remaining one of four originally cast.

Highland Park—A small additional force of men, besides those usually employed in this park, have done good work in the construction of the new drive along the west side of the park and bordering the reservoir, and the work will be continued as long as the weather permits. Top-soil has been spread along the gravelled banks of the reservoir, preparatory to planting in the spring. Two rustic arbors have been erected, on points commanding fine views, adding greatly to the pleasure of visitors. A contract has been entered into for the construction of a rustic masonry bridge, in accordance with plans prepared by the department.

Forest Park—In addition to the regular work of guarding the park and protecting it from fires and depredations, a nine-hole golf course has been constructed which has proven very popular, being patronized by nearly nine hundred players.

Kings Park (Jamaica)—More than the usual attention has been given to the care of this park during the past year, although no funds were available for special improvements. The park is now lighted at night and furnished with settees and a drinking fountain, the water for which is furnished free of expense to the

department through the generosity of Mr. Charles Lockwood. Among the interesting additions to Kings Park is the original door from the historical Blackwell mansion that stood near the foot of Webster avenue, Ravenswood, Long Island, built by Jacob Blackwell about 1720. Many interesting traditions cluster about this venerable door. George Washington, as well as many of his illustrious predecessors and successors, are said to have passed its portals. The history of those who have stepped over its threshold would be the social history of Long Island. Colonel Jacob Blackwell, of the Continental Army, was the owner during the War of the Revolution, and, being the property of an American patriot, the house and land were confiscated by the British, and a broad arrow mark, still plainly to be seen on the upper part of the door, was put there as the mark of confiscation to the crown. Through the kind assistance of Mr. Charles Benner the heirs of the property presented the door intact to the city of New York, to be preserved as the door of the old mansion in Kings Park.

Ashmead Park—This once beautiful little spot is being rapidly restored by the removal of dead trees, the pruning and care of living ones and the filling in of the park and grading with top-soil, preparatory to planting in the spring.

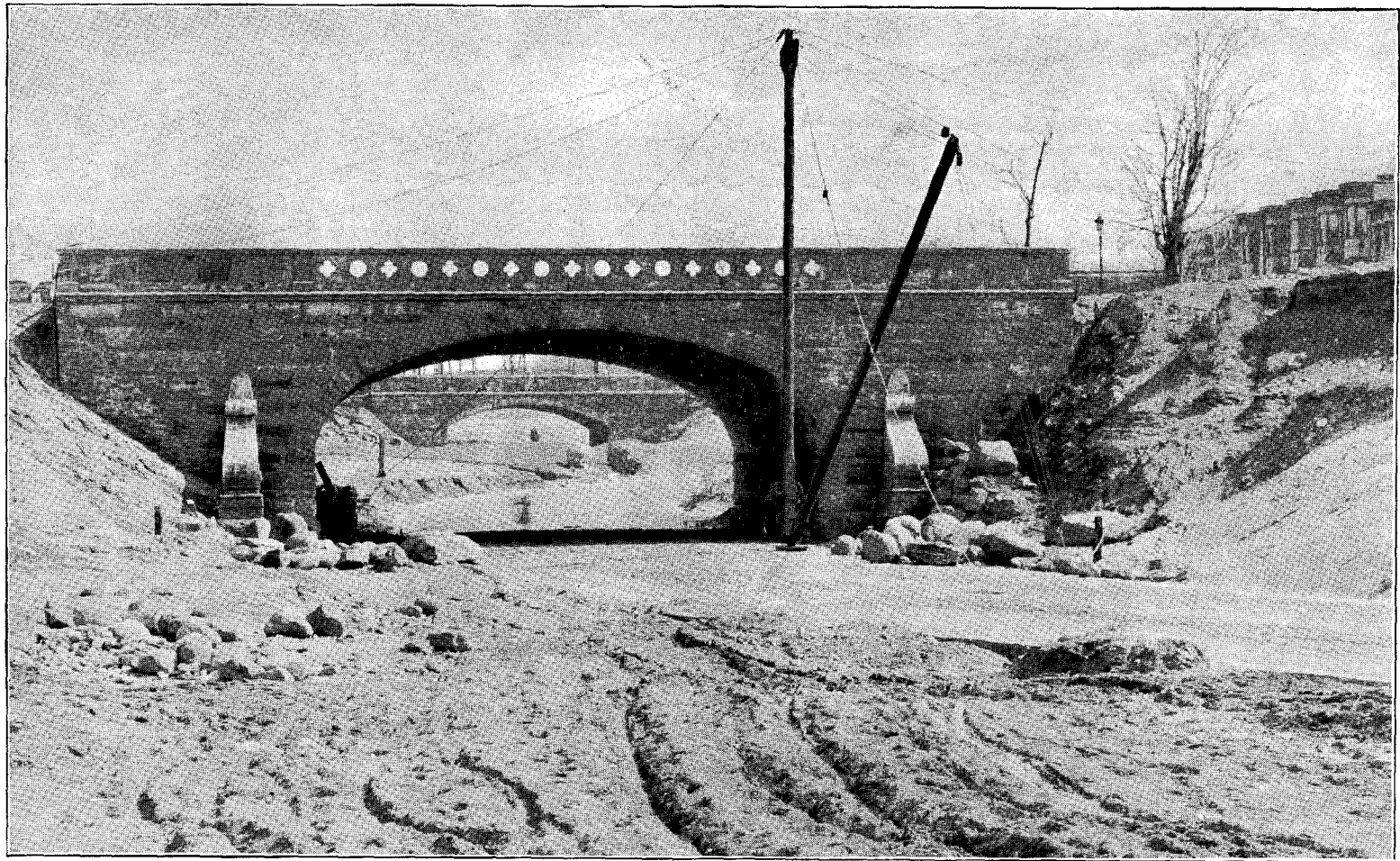
Sunset Park—No appropriation was available for extensive improvements, but the park is a popular resort in its unfinished state. The golf course was improved, and the work of retaining the falling bank in a naturalistic manner was continued on the Forty-first Street side.

Canarsie Beach, Lincoln Terrace, Dyker Beach and New Lots Playground—These parks are all open to the public and have received the necessary attention to keep them clean and in good condition. The road through Dyker Beach (Franklin avenue) has been reconstructed, graded and resurfaced with trap rock. The road is 2,100 feet long and 25 feet wide.

Coney Island Park—The hope of making permanent improvements at Coney Island, so greatly desired, was again disappointed for lack of an appropriation. A new comfort house was built out of the maintenance fund and, by great efforts, the Concourse and all the park property has been kept clean and presentable.

Roadways and Boulevards—The entire system of drives, embracing a total of about forty-six miles, has been carefully maintained throughout the year, and regularly sprinkled in dry and dusty weather. The trees have been trimmed, and new ones planted to take the place of those that died, and a thorough brushing and spraying with insecticide when necessary have greatly aided in destroying the various insect pests. The grass along the sidewalks has been cut and the borders trimmed, weeds removed and grass seed sown in bare places.

Bay Ridge Parkway (Shore Drive)—The work of improving the new section of this parkway, from the Shore road proper to Fourth avenue, has steadily progressed, and the greater portion of the rough grading is already done.



The work to follow, consisting of the surface grading, top-soiling, making walks and planting, will make an immediate show, and before another season it will have the appearance of a finished parkway. The contract for the construction of the stone archways under Second and Third avenues has been completed by The Eastern Stone Company, and the contract with Thomas Monahan for the construction of the gutters and roadway has also been fulfilled. The latter contract included the construction of 4,975 feet of brick gutters and 2,550 feet of roadway, 40 feet in width. The work of grading this parkway presents peculiar difficulties, owing to the sandy nature of the soil. A large amount of labor had to be expended in preparing the foundations for the retaining rock work and boulders that is not apparent on the surface.

**Ocean Parkway**—The main drive of Ocean parkway, between Twenty-second avenue and Coney Island, was resurfaced with coarse bank gravel taken from the Department's gravel pit, about 3,000 truck-loads being used. The Bridle Road on the east side of the Parkway was cleaned and covered with a layer of fine gravel and sand, about two inches in thickness, from the Park circle to Kings Highway, a distance of three and one-half miles. The main drive, from the Speedway west for 1,650 feet, and 2,700 feet from Avenue D east, was resurfaced with gravel. The West Drive, from between Avenues M and N to Avenue P, a distance of 2,350 linear feet, was picked up and resurfaced with trap rock, and a distance of 250 feet south of Kings Highway was also treated in the same manner. The circle at Fort Hamilton avenue and Ocean parkway entrance to Prospect Park was picked up and resurfaced with Hudson river gravel. A sewer was laid on the parkway from Avenue U, south along the Bridle Road, and 1,850 feet of 18 inch, 1,630 feet of 15 inch and 259 feet of 12 inch pipe were laid. Eight catch basins and sixteen manholes were constructed. A sewer was also laid at the Park Circle, and three cesspools, four new basins and three manholes were built, and two old basins reconstructed. The Parkway at the intersection of Avenue U was resurfaced with screenings, and the main drive, from Kings Highway south, was resurfaced with a thin layer of trap rock screenings. The trees along the Ocean parkway were carefully trimmed and pruned, and sprayed when necessary.

**Eastern Parkway**—The main drive of Eastern parkway, from Brooklyn avenue to Pitkin avenue, was repaired with broken stone, and 1,400 feet from Albany avenue east, and 700 feet from Rogers avenue to Nostrand avenue, were picked up and resurfaced with Hudson river gravel. Three new intersections were made on the north and south drives at Brooklyn and New York avenues, and one intersection on the north traffic road was repaired. The paths on both sides of the Parkway were resurfaced with limestone screenings. Four new catch basins were built and fifty feet of sewer pipe laid at Albany avenue. Fifteen hundred feet of shoulder of macadam and Belgian roadway were picked up and resurfaced.

**Fort Hamilton Avenue and Bay Parkway (Twenty-Second Avenue)**—These parkways were carefully maintained and regularly sprinkled throughout the year. On Fort Hamilton avenue new catch basins were built, two at Fifty-first street, two at Seventy-fifth street, three at Ninety-ninth street and two at Forty-second street. Twenty-second avenue, for a distance of 1,500 linear feet, was picked up and resurfaced from Gravesend avenue south.

**Glenmore Avenue**—Glenmore avenue was resurfaced from Cleveland street to Essex street, and the entire length of the avenue from Eastern parkway extension to the County line was repaired and kept in good condition.

**Eastern Parkway Extension, Etc.**—Eastern parkway extension, Stone avenue and the other Twenty-sixth Ward streets under the jurisdiction of this Department all received careful attention, the roads being kept clean, sprinkled and repaired, the grass cut and the basins cleaned.

**New Lots Road**—New Lots road was filled in with ashes and broken stone from Berriman street south, and put in good condition.

**Coney Island Concourse**—Owing to the damage done by the storm on November 20, a large number of men and teams were employed in cleaning up the beach and Concourse.

**Gifts to the Department**—During the year 1901 the following plants, animals and birds were presented to the Department: One brown eagle, from Mr. D. Leahy, No. 990 Bedford avenue, Brooklyn; one raccoon from Mr. Smith, No. 224 Skillman street, Brooklyn; one Hibiscus plant, from Mr. P. Caminoni, No. 300 Lewis avenue, Brooklyn; a large number of native ferns, from Mr. J. H. Freeborn, of Dumont, New Jersey; one chimpanzee, from Mrs. Butler, of Twelfth avenue and Sixty-seventh street, Brooklyn; one fantail pigeon, from Mrs. C. Cohen, of No. 506 Eleventh street, Brooklyn; one raccoon, from Mr. P. S. Kline, of No. 551 Fifth avenue, Brooklyn; one raccoon, from Mr. J. W. Butner, of No. 278 Lexington avenue, Brooklyn; two peacocks, from Mrs. H. Blohn, of Foster avenue and East Third street, Brooklyn; one collie dog, from Mr. William Woglam, No. 24 Vindsor place, Brooklyn; one golden pheasant, from Mr. F. C. Cocheu, Fort Hamilton avenue and Seventy-fifth street; one monkey, from Mr. Douglas Murray, No. 40 Prospect street, Brooklyn; three white Pekin ducks, from Mr. MacLevy, of Union street, Brooklyn; one century plant, from Mrs. T. Gerhart, No. 459 Fourteenth street, Brooklyn; one large parrot, from Mrs. E. R. Kennedy, No. 33 Prospect Park West; one variegated agave, from Mrs. Charles Aubrey; one parakeet, from Mr. John Hannon, No. 30 Columbia place; one raccoon from Mr. John Pelly, No. 1517 Eighth avenue; one orchid (*Cypripedium insigne*), from Mr. F. A. Jewett, No. 282 Hancock street, and a collection of orchids, from the New York Botanical Gardens, Bronx Park, New York.

Respectfully submitted, JOHN DE WOLF, Landscape Architect.  
ALAN BOODY, Superintendent.

## REPORT OF THE CAPTAIN OF POLICE.

Brooklyn, December 31, 1901.

Hon. GEORGE V. BROWER, Commissioner, Department of Parks, Boroughs of Brooklyn and Queens.

Sir—I have the honor to herewith submit my annual report of the work accomplished by the men constituting the police force of the Seventy-third Precinct (Prospect Park), together with such other information in relation to games, etc., as is of general interest and which comes under police supervision.

The Police Force—The police force during the year consisted of the following members: One captain, four sergeants four roundsmen and fifty-eight patrolmen. One sergeant is detailed in charge of horses, etc., for the Borough of Brooklyn. One of the roundsmen and ten patrolmen are mounted, four to patrol the Ocean parkway, two on Eastern parkway, four in the park proper. The remaining forty-eight patrol the park on foot. Total force, 67.

The Arrests—There were sixty-three arrests made during the year for the following offenses: Arson, one; intoxication, twenty-three; assaults, six; indecent exposure, two; malicious mischief, six; violation of park ordinances, nine; vagrancy, eight; petit larceny, two; attempted suicide, two; and disorderly conduct, four.

Parades—The following parades occurred in and about the park: On May 24, anniversary of the Brooklyn Sunday School Union; on May 26, parade and decoration of the Lincoln and Warren statues; on May 30, Memorial Day parade; on October 26, light harness horse parade; and on November 16, automobile parade and races.

Field Sports—There were 1,800 games of baseball on the Parade Ground, as follows: In April, 190; in May, 478; in June, 375; in July, 380; in August, 290; in September, 80; in October, 7. There were 100 games of cricket, as follows: In May, 23; in June, 37; in July, 20; in August, 15; and in September, 5. There were 1,000 games of basket-ball played during the months of April, May and September. Ninety-five games of football were played during the months of October and November, and there were two and one-half days of skating during the month of January.

Summer Picnics—During the year there were 420 picnics in Prospect Park, with an attendance of 49,557 persons, as follows: Sunday school picnics, 173, with an attendance of 36,400 persons; private parties, 12, with an attendance of 590 persons; May parties, 15, attendance, 450 persons; family parties, 242, attendance, 12,117 persons. The picnics took place in the following months: In May, 105, attendance, 4,785 persons; in June, 98, attendance, 13,130 persons; in July, 125, attendance, 6,650 persons; in August, 65, attendance, 8,700 persons; in September, 27, attendance, 6,292 persons; in October, 420, attendance, 49,957 persons.

Park Concerts—The following concerts were given in Prospect Park during the year: Saturday concerts, 14; Sunday concerts, 14; first concert June 2, and last concert September 8. There were also three extra concerts in Prospect Park, one on July 4, one by the Brooklyn War Veterans and Sons' Association on September 21, and a concert under the auspices of the United German Singers of Brooklyn on September 29.

Accidents, Etc.—There were 165 accidents during the year, as follows: Accidents to carriages, sleighs and other vehicles, 87; bicycles, 35; caused by runaway horses, 25; accidents to persons taken sick and falling in the park, 8. There were seventy-five ambulances called to the aid of persons who were taken sick or injured, of which 28 were removed to the hospitals and the remaining 46 taken to their homes.

Respectfully submitted,

MICHAEL A. McNAMARA,

Captain Seventy-third Precinct, Prospect Park.

STATEMENT OF EXPENDITURES OF THE DEPARTMENT OF PARKS  
OF THE BOROUGH OF BROOKLYN AND QUEENS  
DURING THE YEAR 1901.

January 2—John F. Maillie, Hudson River Gravel.....	\$2,770 02
January 2—John F. Maillie, Trap Rock and Screenings.....	4,835 02
January 5—The Nassau Fire Insurance Company, Insurance on building in Bedford Park.....	25 00
January 10—William Fitzgerald, Granite Paving Blocks.....	148 92
January 10—George W. Perry, Repairing Furnace in Kings Park, Jamaica .....	40 25
January 10—Robert T. Brown, Secretary, Office Disbursement.....	23 12
January 10—Harris & Maguire, Laying Sewer Pipe on Ocean Parkway	413 75
January 10—Harris & Maguire, Laying Water Pipe.....	437 15
January 10—Edward E. Peirson, Cement Pipe.....	5 25
January 11—Frederick Balz, Property for Bay Ridge Parkway (Shore Drive) .....	1,740 00
January 11—The Brooklyn Union Gas Company, raising and relaying Gas Main on Third Avenue (Bay Ridge Parkway)....	125 00
January 11—F. X. Kerrigan, Chief Clerk, Office Disbursements.....	\$77 24
January 12—Thomas Monahan, work on Bay Ridge Parkway (Shore Drive) .....	1,771 00
January 15—The Williamsburgh City Fire Insurance Company, Insurance on Houses in Forest Park .....	85 50



January 15—Baker, Voorhis & Co., Session Laws of 1895.....	4 50
January 15—Frank J. Gallagher, Paving Gutter on Fort Hamilton Avenue .....	162 20
January 15—W. A. Manda, Plants and Bulbs .....	19 50
January 15—The I. S. Remson Manufacturing Company, one pair of Rubber Tires.....	36 00
January 15—William E. Verity, Milling 1,500 feet of Pine.....	36 00
January 15—Frederick W. Kelsey, Azaleas.....	75 00
January 15—Ed. T. Buckingham, Plants and Bulbs.....	35 68
January 15—The New York and New Jersey Telephone Company, Telephone Service.....	98 02
January 15—Standard Oil Company of New York, Three barrels of Kerosene Oil.....	15 99
January 15—M. M. Corwin, Stove Supplies.....	7 70
January 15—Brooklyn District Telegraph Company, Messenger Service.	5 39
January 15—Keuffel & Esser Co., Blue-print Paper.....	3 60
January 15—The Eastern Stone Company, Work on Archways (Bay Ridge Parkway).....	3,302 87
January 18—John P. Conkling, Building Stone.....	318 80
January 21—P. J. Carlin & Co., Work on Centre Pavilion of Museum of Arts and Sciences.....	35,168 89
January 23—Samuel W. Cornell, Hardware.....	148 58
January 24—Thomas C. Dunham, Inc., Painting Materials.....	1,181 55
January 24—William E. Verity, Lumber.....	203 54
January 24—Ruwe Bros., Blacksmithing Materials.....	164 73
January 24—Ellwood Weeks, Brick and Cement.....	57 90
January 26—The Continental Insurance Company, Insurance on buildings on Furman Street (Brooklyn Heights Park)....	16 00
January 26—Aetna Insurance Company, Insurance on building on Furman Street (Brooklyn Heights Parks).....	10 00
January 28—Peter Elbert Nostrand, Surveys for second section of Museum of Arts and Sciences.....	306 00
January 28—John F. Maillie, Trap Rock and Screenings.....	4,707 57
February 6—Olmsted Bros., Maps of Prospect Park.....	30 00
February 6—The I. S. Remson Manufacturing Company, One dozen Bandages, for horses.....	3 00
February 6—Frank D. Creamer & Co., 2,000 North River Brick.....	14 30
February 6—F. Donovan & Son, Corn, Meal, Screenings, etc.....	46 76
February 6—P. J. May, New Shoes and Pads, for Horses.....	84 50
February 6—McKim, Mead & White, Architects' Fees, Museum of Arts and Sciences.....	1,672 65

February 6—F. Donovan & Son, Oats, Hay, Straw, etc.....	494 12
February 6—T. E. Crimmins, Marcellus Shale Sandstone Screenings...	1,747 20
February 7—Nelson Bros., Coal.....	601 98
February 7—Nelson Bros., Coal.....	758 40
February 7—J. M. Thorburn & Co., Flower Seeds.....	28 25
February 7—Brooklyn Daily Eagle, Printing Foremen's Reports.....	6 50
February 7—Robert T. Brown, Secretary, Office Disbursements.....	23 03
February 8—Timothy Concklin, 25 truck-loads of Manure.....	31 25
February 8—William Cunningham, 25 truck-loads of Manure.....	31 25
February 8—John Dailey, 25 truck-loads of Manure.....	31 25
February 8—Francis Heaney, 25 truck-loads of Manure.....	31 25
February 8—John C. Keegan, 25 truck-loads of Manure.....	31 25
February 8—F. X. Kerrigan, Chief Clerk, Office Disbursements.....	77 36
February 9—Thomas E. Wheeler, Cow Manure.....	16 00
February 9—Michael Mullady, 25 truck-loads of Manure.....	31 25
February 9—James Reagan, 25 truck-loads of Manure.....	31 25
February 9—James Rhatigan, 25 truck-loads of Manure.....	31 25
February 9—Patrick Riley, 25 truck-loads of Manure.....	31 25
February 9—Frederick Robinson, 25 truck-loads of Manure.....	31 25
February 9—Ditzenberger Brothers, Plants.....	12 50
February 9—W. A. Manda, Camelias.....	575 00
February 9—John Davis' Sons, Tinning Roof at Mansion.....	67 00
February 13—Ellwood Weeks, Dyckerhoff Cement.....	47 25
February 13—Lawrence Ledwith, 25 truck-loads of Manure.....	31 25
February 15—John Golden, 25 truck-loads of Manure.....	31 25
February 15—John Hart, 25 truck-loads of Manure.....	31 25
February 15—Patrick Hart, 25 truck-loads of Manure.....	31 25
February 15—Patrick Hussey, 25 truck-loads of Manure.....	31 25
February 15—George Kane, 25 truck-loads of Manure.....	31 25
February 15—Thomas Kane, 25 truck-loads of Manure.....	31 25
February 15—Patrick Keegan, 25 truck-loads of Manure.....	31 25
February 15—John Fullum, 25 truck-loads of Manure.....	31 25
February 15—H. Engelberg, 25 truck-loads of Manure.....	31 25
February 15—Alexander Clancy, 25 truck-loads of Manure.....	31 25
February 15—Michael Buggy, 25 truck-loads of Manure.....	31 25
February 15—William Buckley, 25 truck-loads of Manure.....	31 25
February 15—Edison Electric Illuminating Co., Electric Connections at Picnic Shelter.....	60 00
February 15—Dr. George H. Berns, professional examination of Horses .....	10 00
February 15—W. F. Doyle, D. V. S., Veterinary Services.....	153 00

February 15—P. Kane Harness Manufacturing Co., Repairs to Harness, etc. ....	9 30
February 15—P. Kane Harness Manufacturing Co., Harness Supplies, etc. ....	23 25
February 15—Samuel W. Cornell, Feed Mangers, etc. ....	19 50
February 19—James G. Shaw, Assignee of Manhattan Construction Company, retained percentage on contract for Macad- amizing Fort Hamilton Avenue. ....	2,370 60
February 19—Thomas G. Callandriella, 25 truck-loads of Manure. ....	31 25
February 19—Thomas Walsh, 25 truck-loads of Manure. ....	31 25
February 19—William Smith, 25 truck-loads of Manure. ....	31 25
February 19—William Smith, 25 truck-loads of Manure. ....	31 25
February 19—William H. Robertson, 25 truck-loads of Manure. ....	31 25
February 19—Daniel Price, 25 truck-loads of Manure. ....	31 25
February 19—Thomas Rice, 25 truck-loads of Manure. ....	31 25
February 19—Richard O'Brien, 25 truck-loads of Manure. ....	31 25
February 19—James Murray, 25 truck-loads of Manure. ....	31 25
February 19—Patrick McLaughlin, 25 truckloads of Manure. ....	31 25
February 19—Hugh McArdle, 25 truckloads of Manure. ....	31 25
February 19—Joseph Martin, 25 truckloads of Manure. ....	31 25
February 19—John Martin, 25 truckloads of Manure. ....	31 25
February 19—M. J. Keely, 25 truckloads of Manure. ....	31 25
February 19—Daniel Gill, 25 truckloads of Manure. ....	31 25
February 19—Timothy Conklin, 25 truckloads of Manure. ....	31 25
February 20—T. E. Crimmins, Marcellus Shale Sandstone Screenings..	1,277 64
February 20—The Eastern Stone Co., Work on Archways, Bay Ridge Parkway .....	2,251 34
February 21—F. N. DuBois, Plumbing Materials. ....	2,585 27
February 21—Thomas Rice, 60 bushels of Carrots. ....	25 20
February 21—Robert H. Taylor, Milk for Animals. ....	36 00
February 21—The John H. Shults Co., Bread for Animals. ....	13 50
February 21—The John H. Shults Co., Bread for Animals. ....	25 20
February 28—Nelson Bros., one ton of Cumberland Coal. ....	4 75
February 28—Pierce, Butler & Pierce Mfg. Co., one set of Gaskets for Boiler .....	1 75
February 28—Abraham & Straus, one Oil Range. ....	17 74
February 28—C. W. Keenan, Modeling Clay. ....	7 50
February 28—The I. S. Remson Manufacturing Co., one Fifth Wheel. ....	\$20 00
February 28—Frank D. Creamer & Co., one Sail for cover to Chinese Sampan .....	30 00

February 28—The Brooklyn Union Gas Co., Gas at Litchfield Mansion.	42 18
March 8—William E. Verity, Lumber.....	1,735 41
March 8—Kings County Gas & Illuminating Co., Lowering and Relay- ing Gas Mains on Shore Road.....	35 10
March 8—Brooklyn District Telegraph Co., Messenger Service.....	5 60
March 8—Charles J. Dunne, Meat and Fish for Animals.....	24 18
March 8—Robert H. Taylor, Milk for Animals.....	18 60
March 8—Thomas Rice, Mangels.....	50 40
March 8—J. M. Thorburn & Co., Flower Seeds.....	12 00
March 8—Jacob Muller, Harness and Stable Supplies.....	81 60
March 8—Geo. M. Eddy & Co., Steel Tapes.....	51 75
March 8—Keuffel & Esser Company, Surveyors' Supplies.....	89 70
March 8—The I. S. Remson Manufacturing Company, Blankets and Robes .....	53 00
March 8—Samuel W. Cornell, Hardware, etc.....	50 75
March 8—Fox Brothers & Co., Oilskin Suits and Hats.....	6 00
March 8—Standard Oil Company of New York, Kerosene Oil.....	19 75
March 8—Frank D. Creamer & Co., Buff Front Brick.....	105 00
March 8—John A. Scollay, Boiler Appliances, etc.....	96 54
March 8—Ruwe Bros., Blacksmithing Materials.....	25 00
March 8—F. Donovan & Son, Corn, Screenings, etc.....	55 70
March 11—P. Kane Harness Manufacturing Company, Repairs to Har- ness, etc.....	27 50
March 11—W. F. Doyle, D. V. S., Veterinary Services.....	47 00
March 11—New York & New Jersey Telephone Company, Telephone Service .....	131 67
March 11—Edison Electric Illuminating Company, Electric Light at Farm House, Shelter House, etc.....	127 73
March 11—Flatbush Water Works Company, Water, at Willink En- trance, January 1 to February 1.....	10 49
March 11—Flatbush Water Works Company, Water, at Willink En- trance, October 31 to November 30.....	13 27
March 11—Flatbush Water Works Company, Water, at Willink En- trance, November 30 to December 31.....	13 59
March 11—Jamaica Water Supply Company, Water, at Forest Park....	11 25
March 11—Woodhaven Water Supply Company, Water, at Forest Park.	14 95
March 19—Francis X. Kerrigan, Chief Clerk, Office Disbursements....	99 14
March 19—William Miller, 25 truck-loads of Manure.....	31 25
March 19—Mrs. C. Martin, 25 truck-loads of Manure.....	31 25
March 19—John Maloney, 25 truck-loads of Manure.....	31 25

March 19—Edward T. Maher, 25 truck-loads of Manure.....	31 25
March 19—James Maguire, 25 truck-loads of Manure.....	31 25
March 19—Charles Maguire, 25 truck-loads of Manure.....	31 25
March 19—Jacob Kuntz, 25 truck-loads of Manure.....	31 25
March 19—Patrick Keegan, 25 truck-loads of Manure.....	31 25
March 19—Patrick Connor, 25 truck-loads of Manure.....	31 25
March 19—James Corcoran, 25 truck-loads of Manure.....	31 25
March 19—John Condon, 25 truck-loads of Manure.....	31 25
March 19—William Murphy, 25 truck-loads of Manure.....	31 25
March 19—William Buckley, 25 truck-loads of Manure.....	31 25
March 19—William E. French, 75 truck-loads of Manure.....	93 75
March 19—B. French, 25 truck-loads of Manure.....	31 25
March 19—Patrick Farrelly, 25 truck-loads of Manure.....	31 25
March 19—Edward J. Francis, 25 truck-loads of Manure.....	31 25
March 19—Peter Gill, 25 truck-loads of Manure.....	31 25
March 19—John Kennington, 25 truck-loads of Manure.....	31 25
March 19—Henry Lessler, 25 truck-loads of Manure.....	31 25
March 19—Michael Lyman, 25 truck-loads of Manure.....	31 25
March 19—Edward T. Maher, 25 truck-loads of Manure.....	31 25
March 19—James O'Brien, 25 truck-loads of Manure.....	31 25
March 19—James H. Pigot, 25 truck-loads of Manure.....	31 25
March 19—Annie Shearey, 25 truck-loads of Manure.....	31 25
March 19—Edward Sherry, 25 truck-loads of Manure.....	31 25
March 19—James Simpson, 25 truck-loads of Manure.....	31 25
March 19—Henry Armstrong, 25 truck-loads of Manure.....	31 25
March 19—Peter Cassidy, 25 truck-loads of Manure.....	31 25
March 19—Samuel Clarke, 25 truck-loads of Manure.....	31 25
March 19—Mathew F. Smith, 25 truck-loads of Manure.....	31 25
March 19—John Williamson, 50 truck-loads of Manure.....	62 50
March 19—Adam Scherff, 25 truck-loads of Manure.....	31 25
March 19—James Slavin, 25 truck-loads of Manure.....	31 25
March 19—John Smith, 25 truck-loads of Manure.....	31 25
March 19—William Ryan, 25 truck-loads of Manure.....	31 25
March 19—Andrew Riley, 25 truck-loads of Manure.....	31 25
March 19—Thomas Rice, 25 truck-loads of Manure.....	31 25
March 19—John Rowe, 25 truck-loads of Manure.....	31 25
March 19—Thomas Monroe, 25 truck-loads of Manure.....	31 25
March 20—William Moran, 25 truck-loads of Manure.....	31 25
March 20—Peter McCormick, 25 truck-loads of Manure.....	31 25
March 20—John M. Fox, 25 truck-loads of Manure.....	31 25
March 20—James Fox, 25 truck-loads of Manure.....	31 25

March 20—Thomas Fox, 25 truck-loads of Manure.....	31 25
March 20—Robert T. Brown, Secretary, Office Disbursements.....	17 01
March 20—Farrell Duffy, 25 truck-loads of Manure.....	31 25
March 20—James J. Farrell, 25 truck-loads of Manure.....	31 25
March 20—Thomas Flannery, 25 truck-loads of Manure.....	31 25
March 20—Frank Denison, 25 truck-loads of Manure.....	31 25
March 20—Patrick Doran, 25 truck-loads of Manure.....	31 25
March 20—James Dempsey, 25 truck-loads of Manure.....	31 25
March 20—John Dempsey, 25 truck-loads of Manure.....	31 25
March 20—Frank Curran, 25 truck-loads of Manure.....	31 25
March 20—Thomas Delmar, 25 truck-loads of Manure.....	31 25
March 20—James Crague, 25 truck-loads of Manure.....	31 25
March 20—Charles B. Attlesley, 25 truck-loads of Manure.....	31 25
March 20—John Dobbin, 25 truck-loads of Manure.....	31 25
March 20—Thomas E. Wheeler, 25 truck-loads of Manure.....	31 25
March 20—Owen Reilly, 25 truck-loads of Manure.....	31 25
March 22—New York and New Jersey Telephone Co., telephone service.	202 02
March 22—D. W. Bins, ventilator wheels.....	17 50
March 22—P. Kane Harness Manufacturing Co., repairs to harness, etc.	7 05
March 22—Brooklyn District Telegraph Co., messenger service.....	5 20
March 22—The I. S. Remson Manufacturing Co., halters.....	35 00
March 22—Julius Bien & Co., one atlas.....	25 00
March 22—C. W. Keenan, gasoline torch and gasoline.....	4 50
March 22—R. J. Macaulay, one light of polished plate glass.....	6 00
March 22—Standard Oil Co. of N. Y., kerosene oil.....	17 05
March 22—Samuel W. Cornell, hardware, etc.....	41 80
March 22—William E. Verity, lumber .....	94 54
March 22—Ruwe Bros., Mooney pads .....	37 50
March 22—Frank D. Creamer & Co., fire brick, clay, etc.....	10 91
March 22—E. A. Watts, Gutta Percha.....	16 50
March 22—The Gardening Company, subscription to "Gardening".....	10 00
March 22—The I. S. Remson Manufacturing Company, One Buggy.....	185 00
March 22—Brooklyn Daily "Eagle," Disbursement Blanks.....	7 50
March 25—John Grant, 25 truck-loads of Manure.....	31 25
March 25—John Quinn, 25 truck-loads of Manure.....	31 25
March 25—Jacob Kuntz, 25 truck-loads of Manure.....	31 25
March 25—Joseph A. Manda, Moss.....	22 50
March 25—W. F. Doyle, D. V. S., Stock Food.....	17 00
March 25—The Brooklyn Union Gas Company, Gas at Litchfield Man- sion .....	21 15
March 25—James L. Robertson & Sons, Garlock Packing.....	45 85

March 25—Oscar Dummer, Photograph Views.....	12 00
March 25—The Brooklyn Heights Railroad Company, proportionate cost of temporary bridge at Third Avenue and Sixty-sixth Street .....	100 00
March 25—James Thompson, 15 truck-loads of Manure.....	18 75
March 28—Patrick Nannery, 25 truck-loads of Manure.....	31 25
March 28—John Holland, 25 truck-loads of Manure.....	31 25
March 28—Pioneer Machine Works, repairs to Steam Rollers.....	476 00
March 28—Piesch & Nissen, Electrical Repairs.....	30 00
March 28—Edison Electric Illuminating Company, Electric Light at Farm House and Shelter House.....	49 66
March 28—Samuel W. Cornell, Hardware.....	162 06
April 9—Francis X. Kerrigan, Chief Clerk, Office Disbursements....	101 54
April 11—Robert T. Brown, Secretary, Office Disbursements.....	29 10
April 11—George V. Brower, Commissioner, Disbursements.....	20 75
April 11—George V. Brower, Commissioner, Disbursements.....	18 20
April 11—Thomas Rice, Carrots.....	25 00
April 12—F. Donovan & Son, Oats, Hay and Corn.....	504 93
April 12—Ruwe Bros., Blacksmithing Materials.....	562 64
April 12—William E. Verity, Lumber.....	83 12
April 12—F. N. DuBois & Co., Plumbing Materials.....	94 16
April 12—P. J. Carlin & Co., Sixth payment on contract for Centre Pavilion of Museum of Arts and Sciences.....	27,953 90
April 13—Studebaker Bros. Co. of New York, Fixtures for Studebaker Sprinklers.....	109 69
April 13—Isaac A. Sheppard & Co., Grate, etc., for Range at Parade Ground.....	6 00
April 13—Martin B. Brown Co., Voucher Blanks.....	8 20
April 13—J. M. Thorburn & Co., Mats and Thermometers.....	40 25
April 13—F. Donovan & Son, Oats, Cracked Corn, etc.....	256 10
April 13—Dunne & Co., Grass Seed.....	288 00
April 13—Peter Henderson & Co., Grass Seed.....	388 00
April 18—John De Wolf, Landscape Architect, Disbursements.....	12 00
April 18—R. M. Price, Chief Engineer, Disbursements.....	14 50
April 18—William J. Zartmann, Engineer, Disbursements.....	22 70
April 18—Alvin Boody, Superintendent, Disbursements.....	14 50
April 18—John J. Blaney, 22 truck-loads of Manure.....	27 50
April 18—Jacob Kuntz, 25 truck-loads of Manure.....	31 25
April 18—William Miller, 25 truck-loads of Manure.....	31 25
April 18—Brooklyn District Telegraph Company, Messenger Service....	6 25

April 18—McKim, Mead & White, Architects' Fees, Museum of Arts and Sciences.....	698 85
April 18—The Eastern Stone Company, Seventh payment on contract for Archways, Bay Ridge Parkway.....	2,226 88
May 7—A. V. Benoit, One Book, for Engineers' Use.....	1 50
May 7—James T. Shillinglaw, Horse Medicines.....	5 35
May 7—The I. S. Remson Manufacturing Company, Whips and Curry Combs .....	20 40
May 7—The Brooklyn "Citizen," Printing Permits.....	6 25
May 8—Francis X. Kerrigan, Chief Clerk, Office Disbursements.....	109 33
May 9—Robert T. Brown, Secretary, Office Disbursements.....	23 49
May 9—The John H. Shults Company, Bread, for Animals.....	25 50
May 9—Robert H. Taylor, Milk, for Animals.....	35 40
May 9—Charles J. Dunne, Meat and Fish, for Animals.....	44 16
May 9—The Brooklyn Union Gas Company, Gas at Litchfield Mansion	39 60
May 9—Peter Henderson & Co., Flower Seeds.....	5 13
May 9—Joseph A. Manda, Peat and Moss.....	45 00
May 9—William E. French, Top-soil.....	18 75
May 11—Isaac Harris, Roa Hook Gravel.....	668 25
May 11—Isaac Harris, Blue Limestone Screenings.....	2,004 80
May 11—Ruwe Bros., Blacksmithing Materials.....	157 46
May 11—William E. Verity, Lumber.....	280 95
May 11—The Anchor Post Company, Anchor Posts.....	50 00
May 15—Adrian B. DeNyse, as President Board of Trustees, Cemetery property of the Grace M. E. Church of New Utrecht, required for the Bay Ridge Parkway.....	6,000 00
May 16—Nelson Bros., Coal.....	680 00
May 16—Nelson Bros, Coal.....	233 25
May 16—Andrew D. Brown, Sewer Basin Heads.....	180 00
May 21—United Typewriter and Supplies Company, Repairs to Typewriter .....	8 50
May 21—Isaac Harris, Coal.....	392 91
May 21—Alfred B. Sands & Son, Repairs to building at 69 Furman Street (Brooklyn Heights Parks).....	4 60
May 21—William E. French, Grass Sods.....	35 00
May 21—The P. Kane Harness Manufacturing Company, Repairs to Harness, etc.....	9 70
May 25—John S. Loomis, Hire of Bay Mare.....	28 00
May 25—New York and New Jersey Telephone Company, Telephone Service .....	99 11



May 25—Nelson Bros., Coal.....	85 25
May 25—Andrew W. Martin, Paints, etc.....	158 35
May 27—C. H. Joosten, Rhododendrons.....	150 00
May 27—Parsons & Sons Co., Limited, Trees and Shrubs.....	554 55
May 27—Hiram T. Jones, Trees and Shrubs.....	231 10
May 27—John Davis' Sons, Tinning and Painting Roof.....	57 00
May 27—The J. L. Mott Iron Works, Covers, etc., for Horse Drinking Bowl .....	20 25
May 27—Charles E. Ball, Repairs to Range, etc.....	15 10
May 27—A. H. Hews & Co., Flower Pots.....	55 00
May 28—Jas. T. Shillinglaw, Horse Medicines.....	10 00
May 28—A. G. Spalding Bros., Materials for Forest Park Golf Links..	22 95
May 28—W. L. Glidden, Six Extension Ladders.....	36 00
May 28—John M. Bulwinkle, one Property Register.....	6 00
May 28—John Lewis Childs, Plants.....	20 00
May 28—Wm. H. Smith's Sons, Making and Erecting Flag Pole.....	75 00
May 28—Castle Bros., Furnishing and Putting Down Pavement in Miniature Yacht House.....	358 16
May 28—Charles J. Dunne, Meat and Fish, for Animals.....	21 60
May 28—The Elizabeth Nursery Co., Plants and Shrubs.....	30 54
May 28—Brooklyn District Telegraph Co., Messenger Service.....	4 80
May 28—C. H. Joosten, Plants.....	44 00
June 5—Frederick MacMonnies, Final Payment on contract for Side Groups for Memorial Arch.....	10,000 00
June 5—Frederick MacMonnies, Fifth payment on contract for Bronze Statue of General H. W. Slocum.....	6,000 00
June 5—J. & F. Kelly, Removing dock on the Shore Road.....	350 00
June 6—William E. French, Grass Sods.....	40 00
June 6—Henry Hawkes, Jr., Water Connections at Sunset Park.....	127 20
June 6—The P. Kane Harness Manufacturing Co., Repairs to Harness, etc	15 65
June 6—Jas. T. Shillinglaw, Horse Medicines.....	4 25
June 6—Brooklyn District Telegraph Co., Messenger Service.....	30 60
June 10—Robert T. Brown, Secretary, Office Disbursements.....	24 35
June 10—Brooklyn Daily "Eagle," Printing one Book.....	5 75
June 12—Francis X. Kerrigan, Chief Clerk, Office Disbursements.....	122 40
June 12—Ambrose N. Chatfield, Granite Coping at College Point Park....	180 00
June 17—Louis Borjes, Concert at Prospect Park, Saturday, June 1.....	215 00
June 17—Louis Borjes, Concert at Prospect Park, Sunday, June 2.....	215 00
June 17—Louis Conterno, Concert at Prospect Park, Saturday, June 8..	215 00
June 17—W. S. Mygrant, Concert at Prospect Park, Sunday, June 9....	215 00
June 19—Ed. T. Buckingham, Bulbs.....	500 00

June 19—F. Donovan & Son, Oats, Hay, Corn, etc.....	393 04
June 21—Louis Borjes, Concert at Prospect Park, Saturday, June 15....	215 00
June 21—Louis Conterno, Concert at Prospect Park, Sunday, June 16....	215 00
June 21—Frank D. Creamer & Co., 16 barrels of Cement.....	47 20
June 21—Ruwe Bros., Blacksmithing Materials.....	\$404 02
June 21—William E. Verity, Lumber....!	27 30
June 21—American Bicycle Co., one Bicycle.....	42 25
June 28—Frost Bros., Coal.....	342 95
June 28—The Manhattan Supply Co., Hardware, etc.....	062 59
June 28—The Long Island Title Guarantee Co., Searching title to property of Grace M. E. Church on the Bay Ridge Parkway.....	50 00
June 28—F. N. DuBois & Co., Plumbers' Supplies.....	61 37
June 28—Louis Conterno, Concert at Prospect Park, Saturday, June 22....	215 00
June 28—Louis Borjes, Concert at Prospect Park, Sunday, June 23.....	215 00
July 5—The Hastings Pavement Co., Tile pavement in Red Hook Park	307 36
July 5—Edward S. Duffy, Concert at Red Hook Park, Saturday, June 15..	110 00
July 5—Louis Borjes, Concert at Prospect Park, Sunday, June 30.....	215 00
July 5—J. M. Thorburn & Co., 25 pounds of raffia.....	3 75
July 5—Henry Hawkes, Jr., water connections at Highland Park.....	112 65
July 5—C. W. Keenan, gasoline and wood alcohol.....	10 86
July 5—F. Donovan & Son, corn, screenings and oil meal.....	20 70
July 5—Samuel W. Cornell, hardware, etc.....	68 59
July 11—Francis X. Kerrigan, chief clerk, office disbursements.....	121 80
July 11—Robert T. Brown, secretary, office disbursements.....	17 23
July 11—John F. Maillie, trap rock screenings.....	4,667 55
July 12—William E. French, grass sods .....	10 00
July 12—Charles J. Dunne, meat and fish for animals.....	24 18
July 12—Flatbush Water Works Company, water at Willink entrance.	7 11
July 12—Vollkommer & Co., one horse .....	225 00
July 12—Henry A. Dreer, aquatic plants.....	147 25
July 12—Peter Henderson & Co., 100 dahlias.....	8 00
July 12—Thaddeus N. Yates & Co., 200 ampelopsis veitshii.....	12 00
July 12—Bobbink & Atkins, roses.....	30 00
July 12—Dunne & Co., trees and shrubs.....	36 45
July 12—Kissena Nurseries, Plants.....	427 45
July 12—A. L. Miller, plants.....	35 00
July 12—Brooklyn District Telegraph Co., messenger service.....	6 00
July 12—F. E. Brandis Sons & Co., repairs to levels and transits.....	80 05
July 12—P. J. Carlin & Co., seventh payment on contract for centre pavilion of Museum of Arts and Sciences.....	26,069 50
July 12—Abraham & Straus, linoleum and flags.....	156 33

July 12—Jacob Schlaefer, tree protectors.....	130 00.
July 12—Nelson Bros., coal .....	4 75.
July 12—R. J. Macaulay, glass for blue-print frame.....	6 30.
July 12—F. D. Creamer & Co., Whiting.....	13 27.
July 12—Samuel W. Cornell, Hardware, etc.....	32 94.
July 12—William E. French, 50 truck-loads of Manure.....	62 50.
July 12—Christopher Cusick, 25 truck-loads of Manure.....	31 25.
July 12—B. Cambell, 25 truck-loads of Manure.....	31 25.
July 15—Louis Borjes, Services of Soprano Soloist at Concert in Pros- pect Park, Sunday, June 23.....	10 00.
July 15—Louis Borjes, Services of Soprano Soloist at Concert in Pros- pect Park, Sunday, June 30.....	10 00.
July 15—Louis Conterno, Concert at Prospect Park on Saturday, June 29	215 00.
July 15—Louis Borjes, Concert at Prospect Park on Sunday, July 7....	215 00.
July 15—Louis Borjes, Concert at Kings Park, Jamaica, on Thursday, July 4.....	110 00.
July 15—Louis Borjes, Concert at Prospect Park on Saturday, July 6..	215 00.
July 15—F. Donovan & Son, Oats, Hay, etc.....	297 01.
July 15—Ellwood Weeks, Cement.....	43 35.
July 15—F. Donovan & Son, Axle Grease.....	12 18.
July 15—Keuffel & Esser Company, Tracing Cloth.....	6 08.
July 15—Buffalo Pitts Company, One set of Picks, for Steam Roller....	61 60.
July 15—Thomas Ineson, Algae Jell Boiler Compound.....	37 50.
July 15—Ruwe Bros., Wheels, Tires, etc.....	115 49.
July 15—Daimler Manufacturing Company, One Motor.....	500 00.
July 15—New York and New Jersey Telephone Company, Telephone Service .....	98 10.
July 15—F. Donovan & Son, Cracked Corn.....	12 20.
July 15—J. Condon, Plants, etc.....	100 00.
July 15—New York and New Jersey Telephone Company, Telephone Service .....	103 60.
July 15—Pinchurst Nurseries, Magnolia Trees.....	13 50.
July 15—New York and New Jersey Telephone Company, Telephone Service .....	20 84.
July 18—William P. Perkins, ground bone and wood ashes.....	1,127 63.
July 18—Edison Electric Illuminating Co., Brooklyn, electric light in Prospect Park .....	231 01.
July 18—Flatbush Water Works Co., water at Willink entrance to Pros- pect Park .....	28 31.
July 18—Flatbush Water Works Co., water for sprinkling Fort Ham- ilton Avenue .....	130 00.

July 18—Brooklyn Union Gas Co., gas at Litchfield mansion.....	34 74
July 18—The John H. Shults Co., bread, for animals.....	36 00
July 18—Robert H. Taylor, milk for animals.....	36 60
July 18—Thomas F. Shannon, concert at Flushing Park on Thursday, July 4 .....	110 00
July 18—Edward S. Duffy, concert at Fort Greene Park, on Thursday, July 4 .....	110 00
July 18—R. L. Halle, concert at Fort Greene Park on Saturday, July 6.....	110 00
July 20—The Eastern Stone Co., eighth payment on contract for arch- ways, Bay Ridge Parkway (Shore Drive).....	3,565 03
July 24—John F. Maillie, top-soil for Highland Park.....	1,051 20
July 24—Louis Borjes, concert at Prospect Park on Saturday, July 13...	215 00
July 24—Thomas F. Shannon, concert at Prospect Park on Sunday, July 14 .....	215 00
July 24—John George Frank, concert at Prospect Park on Thursday, July 4 .....	210 30
July 24—John F. Cunningham, concert at City Park, on Sunday, July 14.	110 00
July 26—Thomas F. Shannon, concert at Prospect Park on Saturday, July 20 .....	215 00
July 26—Thomas F. Shannon, concert at Prospect Park on Sunday, July 21 .....	215 00
July 26—Edwin W. Stowe, concert at Fort Greene Park on Saturday, July 13 .....	110 00
July 26—Edwin W. Stowe, concert at Bushwick Park on Saturday, July 20 .....	110 00
July 26—William F. Connelly, Concert at Winthrop Park on Saturday, July 20 .....	110 00
July 26—E. C. Stevenson, Concert at Fort Greene Park, Saturday, July 20	110 00
July 26—J. F. Cunningham, Concert at City Park on Sunday, July 21....	110 00
August 6—N. C. Walter & Sons, Park Keepers' Badges and Altering Die .....	42 50
August 6—The I. S. Remson Manufacturing Co., Stable Blankets, Sponges and Truck Harness.....	247 00
August 6—F. D. Creamer & Co., Slaked Lime.....	1 90
August 6—J. W. Fiske Iron Works, one Drinking Hydrant.....	131 25
August 6—A. D. Brown, one Granite Basin Head.....	<b>30 00</b>
August 6—Samuel W. Cornell, Water Pails.....	9 00
August 6—The I. S. Remson Manufacturing Co., Lap Robe.....	4 50
August 6—Brooklyn Daily Eagle, 500 Golf Permits.....	3 75
August 6—Ruwe Bros., Steel Scrapers, etc.....	57 30

August 6—Page Woven Wire Fence Co., Wire and Tools for putting up Wire Fence .....	61 50
August 6—Samuel W. Cornell, Hardware, etc.....	222 27
August 9—Francis X. Kerrigan, Chief Clerk, Office Disbursements.....	102 68
August 9—F. N. DuBois & Co., Plumbing Materials.....	56 70
August 9—William E. Verity, Lumber.....	\$797 84
August 9—Thomas F. Shannon, Concert at Prospect Park on Sunday, August 4 .....	215 00
August 9—Louis Conterno, Concert at Prospect Park on Saturday, July 27 .....	215 00
August 9—James White, Galvanized Iron Roof for Music Stand.....	135 00
August 9—Edwin W. Stowe, Concert at Prospect Park on Saturday, July 27 .....	110 00
August 9—R. L. Halle, Concert at Winthrop Park on Saturday, July 27.	110 00
August 9—Thomas F. Flaherty, Concert at Bushwick Park on Saturday, July 27 .....	110 00
August 9—Thomas F. Shannon, Concert at Prospect Park on Sunday, July 28.....	215 00
August 9—Louis Conterno, Concert at Prospect Park on Saturday, Au- gust 3.....	215 00
August 9—Thomas M. Delaney & Co., Plumbing Materials.....	2 00
August 9—Brooklyn Daily Eagle, Printing Pay-roll Sheets.....	35 50
August 9—A. Pearson's Sons, Chairs, for Musicians.....	90 00
August 9—Schoonmaker & Son, Arsenate of Lead.....	45 00
August 9—Schoonmaker & Son, Arsenate of Lead.....	24 10
August 9—Andrew W. Martin, Kerosene Oil and Painting Materials...	86 20
August 12—Brooklyn Union Gas Company, Gas, at Litchfield Mansion..	12 78
August 12—Charles J. Dunne, Meat and Fish, for Animals.....	26 04
August 12—The John H. Shults Company, Bread, for Animals.....	13 50
August 12—Robert H. Taylor, Milk, for Animals.....	36 60
August 12—William E. French, Top-soil.....	50 00
August 12—Joseph A. Manda, Orchid Moss.....	56 25
August 12—Ellwanger & Barry, Plants and Shrubs.....	42 40
August 12—Robert T. Brown, Secretary, Office Disbursements.....	28 35
August 12—James T. Shillinglaw, Horse Medicines.....	42 25
August 12—The P. Kane Harness Manufacturing Company, Repairs to Harness, etc.....	47 15
August 12—Photogravure and Color Company, Music Programmes.....	531 37
August 12—Jamaica Water Supply Company, Water, at Forest Park....	11 25
August 13—William A. Lewis, Painting Flag Pole on the Shore Road...	25 00
August 13—W. F. Doyle, D. V. S., Veterinary Services.....	82 00

August 13—P. J. May, Shoeing Horses.....	19 25
August 13—Otto N. Bergner, Concert at City Park on Sunday, August 4.	110 00
August 13—Edwin W. Stowe, Concert at Bushwick Park on Saturday, August 3.....	110 00
August 13—Edward S. Duffy, Concert at Fort Greene Park on Saturday, August 3 .....	110 00
August 13—R. L. Halle, Concert at Tompkins Park on Saturday, August 3 .....	110 00
August 13—E. J. McCormick, Concert at City Park on Sunday, July 28..	105 00
August 13—E. J. McCormick, Concert at Fort Greene Park on Saturday, July 27 .....	110 00
August 13—Wm. H. Smith's Sons, Flag-pole for City Park.....	85 00
August 13—Geo. T. King, Supplement to "Nicholson's Dictionary of Gardening" .....	5 00
August 15—Otto N. Bergner, Concert at Winthrop Park on Saturday, August 3 .....	110 00
August 15—Thomas F. Shannon, Concert at Prospect Park on Sunday, August 11 .....	215 00
August 15—Louis Conterno, Concert at Prospect Park on Saturday, August 10 .....	215 00
August 15—Brooklyn District Telegraph Co., Messenger Service.....	6 35
August 15—John S. Loomis, Hire of Bay Mare.....	45 50
August 15—Brooklyn Daily Eagle, Printing Voucher Schedules.....	11 50
August 20—William E. Verity, Lumber.....	671 41
August 20—McKim, Mead & White, Architects' Fees, Museum of Arts and Sciences .....	1,274 18
August 20—Otto N. Bergner, Concert at Winthrop Park on Saturday, August 10 .....	110 00
August 20—R. L. Halle, Concert at Bushwick Park on Saturday, August 10 .....	110 00
August 20—Edward J. McCormick, Concert at City Park on Sunday, August 11 .....	110 00
August 20—Edward J. McCormick, Concert at Fort Greene Park on Satur- day, August 10.....	110 00
August 20—Frost Bros., Coal.....	218 85
August 20—The Eastern Stone Co., ninth payment on Contract for Arch- ways, Bay Ridge Parkway .....	6,859 72
August 23—P. J. Carlin & Co., eighth payment on Contract for Centre Pavilion of Museum of Arts and Sciences.....	24,897 77
August 29—Thomas F. Shannon, concert at Prospect Park on Saturday, August 17 .....	215 00

August 29—Frost Bros., coal .....	432 35
September 5—Edward S. Duffy, concert at Fort Greene Park on Saturday, August 17.....	110 00
September 5—Edwin W. Stowe, concert at Winthrop Park on Saturday, August 17 .....	110 00
September 5—R. L. Halle, concert at Tompkins Park on Saturday, August 17.....	110 00
September 5—Otto N. Bergner, concert at Bushwick Park on Saturday, August 17.....	110 00
September 9—The Woodhaven Water Supply Co., water at Forest Park	13 21
September 9—Flatbush Water Works Co., water at Willink Entrance..	12 55
September 9—Flatbush Water Works Co., water for sprinkling Fort Hamilton Avenue.....	50 00
September 9—Brooklyn Sanitary Co., manure for Red Hook Park.....	80 00
September 9—Hiram T. Jones, pine trees.....	67 80
September 9—Ed. T. Buckingham, plants.....	106 00
September 9—Shady Hill Nurseries, plants and shrubs.....	74 65
September 9—F. Donovan & Son, corn, meal and screenings.....	48 99
September 9—N. Y. & N. J. Telephone Co., telephone service.....	195 72
September 9—Charles Hart, retained percentage on contract, Shore road .....	7,350 00
September 10—F. Donovan & Son, hay, corn, straw, etc.....	964 96
September 10—William E. Verity, lumber.....	266 28
September 10—Ruwe Bros., blacksmithing materials.....	538 42
September 10—Robert T. Brown, secretary, office disbursements.....	18 27
September 10—Francis X. Kerrigan, chief clerk, office disbursements...	117 71
September 10—Brooklyn Daily Eagle, printing envelopes and passes....	13 50
September 10—The J. L. Mott Iron Works, one drinking fountain.....	40 13
September 10—D. Van Nostrand Co., six books on botany.....	15 75
September 10—E. J. McCormick, concert at City Park on Sunday, August 25.....	110 00
September 10—Benjamin Wechsler, concert at Tompkins Park on Saturday, August 10.....	110 00
September 10—Louis Conterno, concert at Prospect Park on Sunday, September 1.....	215 00
September 10—Thomas F. Shannon, concert at Prospect Park on Sunday, August 25.....	215 00
September 10—Otto N. Bergner, concert at Fort Greene Park on Saturday, August 31.....	110 00

September 10—The Brooklyn Alcatraz Asphalt Company, retained percentage on contract for resurfacing walks in Prospect Park .....	1,453 86
September 11—Thomas Monahan, sixth payment on contract for work on Bay Ridge parkway (Shore drive).....	1,769 74
September 12—Nelson Bros., one ton of Cumberland coal.....	4 73
September 12—American Bicycle Co., bicycle tires.....	10 00
September 12—Schoonmaker & Co., arsenate of lead.....	45 00
September 12—Samuel W. Cornell, galvanized wire.....	8 80
September 12—Samuel W. Cornell, hardware, etc.....	\$30 00
September 12—Samuel W. Cornell, wire cloth and barbed wire.....	90 00
September 12—William E. Verity, lumber.....	22 24
September 12—The J. L. Mott Iron Works, drinking fountain and faucets .....	110 25
September 12—Jacob Muller, harness and stable supplies.....	90 80
September 13—Kerr & Soper, boulders for Sunset Park.....	142 80
September 13—H. Irvington Pinckney, two rustic arbors in Highland Park .....	1,125 00
September 13—G. E. Conterno, concert at Prospect Park on Saturday, August 31.....	210 00
September 13—Flatbush Water Works Co., water at Willink entrance to Prospect Park.....	20 68
September 13—The John H. Shults Co., Bread for Animals.....	13 50
September 13—Robert H. Taylor, Milk, for Animals.....	18 60
September 13—Charles J. Dunne, Meat and Fish, for Animals.....	26 04
September 13—The B. F. Goodrich Company, Rubber Hose.....	32 00
September 13—D. W. Binns, Cast Iron Basin Pans.....	25 00
September 13—Abraham & Straus, Awnings, for Music Stand.....	40 00
September 13—Wm. H. Smith's Sons, Flag-poles at Fort Hamilton and Red Hook Parks.....	150 00
September 13—The P. Kane Harness Manufacturing Company, Harness Repairs.....	33 55
September 13—James T. Shillinglaw, Horse Medicines.....	10 70
September 13—James T. Shillinglaw, Horse Medicines.....	17 10
September 13—The P. Kane Harness Manufacturing Company, Harness Repairs.....	19 60
September 13—W. F. Doyle, D. V. S., Veterinary Services.....	88 50
September 13—Henry Hawkes, Jr., Water Connections at Fort Hamilton Park.....	44 18
September 13—Harris & Maguire, Raising Water-main, Bay Ridge parkway .....	675 00



September 13—Harris & Maguire, Lowering Water Mains, Bay Ridge parkway .....	275 00
September 13—W. S. Mygrant, Concert at Prospect Park on Saturday, September 7.....	215 00
September 13—Photogravure & Color Company, Music Programs.....	19 50
September 17—Abraham & Straus, Globes, for main entrance to Pros- pect Park.....	225 00
September 17—Edison Electric Illuminating Company, Electric Light in Prospect Park.....	50 69
September 17—Brooklyn District Telegraph Company, Messenger Ser- vice .....	6 35
September 21—William E. Verity, Lumber.....	247 67
September 21—Wm. H. Smith's Sons, Flag-poles at College Point and Linden Parks.....	150 00
September 21—Frank D. Creamer & Co., Brick and Cement.....	639 32
September 21—Patrick J. McNally, Repairs to Buildings on Furman street (Brooklyn Heights Parks).....	1,663 00
September 25—P. J. Carlin & Co., Extra work on Museum Building. .	2,079 30
September 25—George Deyo, Agent and Warden, Pails, Ash Cans, Baskets, etc.....	323 10
September 25—George Deyo, Agent and Warden, Pails, Dust Pans, Dippers, etc.....	172 26
September 25—Addison Johnson, Agent and Warden, Brooms, Brushes, etc. ....	267 50
September 25—Addison Johnson, Agent and Warden, Brooms, Dusters and Brushes.....	128 65
September 25—J. Warren Mead, Agent and Warden, Brooms and Chairs .....	172 60
September 26—J. Warren Mead, Agent and Warden, Brooms.....	77 08
September 26—Thomas F. Shannon, Concert at Prospect Park on Satur- day, September 21.....	215 00
September 26—S. W. Howard, Erecting Women's Toilet at Coney Island	500 00
September 26—Wm. C. O'Keeffe & Son, Plumbing work at Coney Island Shelter .....	600 00
September 30—Ambrose N. Chatfield, Sewer Basins.....	210 00
September 30—Frost Bros, Coal.....	266 00
September 30—F. N. DuBois & Co., Plumbing Materials.....	160 50
September 30—August Wille, Painting iron fences, stairways, benches, etc. ....	1,792 65
October 4—F. N. DuBois & Co., Plumbing Materials.....	526 49
October 4—Ruwe Bros., Iron.....	80 00

October 4—Andrew W. Martin, Kerosene Oil, etc.....	142 56
October 4—Charles Zeller & Son, Plants.....	60 00
October 7—Thomas F. Shannon, Concert at Prospect Park on Sunday, September 29.....	215 00
October 7—Michael Clark, Repairing, Plastering, etc., at Kings Park, Jamaica .....	15 00
October 7—Eastern Chemical Co., Plant Food.....	8 10
October 7—Frank D. Creamer & Co., Whiting.....	13 68
October 7—Frank D. Creamer & Co., Cement.....	165 75
October 7—Frank D. Creamer & Co., Whiting.....	13 61
October 7—C. W. Keenan, Mason's Black.....	3 75
October 7—D. W. Binns, Basin Pans.....	45 00
October 7—Samuel W. Cornell, Buckles, Baskets and Axles.....	40 80
October 7—Frederick Loeser & Co., Wagon Umbrellas.....	12 00
October 11—Miss K. Baillie, Services as Soloist at Prospect Park con- cert on Sunday, September 1.....	10 00
October 11—Francis X. Kerrigan, Chief Clerk, Disbursements of Pros- pect Park Office.....	118 08
October 11—Robert T. Brown, Secretary, Disbursements of Borough Hall Office.....	33 73
October 15—James T. Shillinglaw, Horse Medicines.....	4 15
October 15—Brooklyn District Telegraph Company, Messenger Service.....	8 85
October 15—Joseph P. Meehan, Water Connections.....	68 70
October 15—Reliable Roofing Company, Repairing roofs of buildings on Furman Street (Brooklyn Heights Parks).....	50 00
October 15—Duparquet, Huot & Moneuse Company, Waterback, etc., for Range.....	13 50
October 15—Ronalds & Johnson Company, Plumbing Materials.....	27 45
October 15—Aeolipyle Company, Three Aeolipyles.....	95 00
October 15—F. N. DuBois & Co., Plumbing Materials.....	10 95
October 15—Ruwe Bros., New top for Wagon.....	18 00
October 15—National Trading Company, Sewer Pipe.....	72 00
October 15—Isaac Harris, Stove Coal.....	5 20
October 15—The John H. Shults Company, Bread, for Animals.....	12 00
October 15—Flatbush Water Works Company, Water, for sprinkling Fort Hamilton Avenue.....	50 00
October 15—Robert H. Taylor, Milk, for Animals.....	-19 32
October 15—Charles J. Dunne, Meat and Fish, for Animals.....	25 20
October 15—Thomas Rice, 50 truck-loads of Manure.....	62 50
October 15—Joseph Higgins, 50 truck-loads of Manure.....	62 50
October 15—J. M. Thorburn & Co., Seeds and Bulbs.....	112 85

October 15—Coldwell Lawn Mower Company, Maintenance of Lawn Mowers .....	975 00
October 15—The New York and New Jersey Telephone Company, telephone Service.....	100 30
October 15—Frederick MacMonnies, Sixth payment on contract for bronze statue of General Henry W. Slocum.....	6,000 00
October 15—Frank D. Creamer & Co., Brick and Cement.....	283 30
October 19—F. Donovan & Son, Corn, Oats and Hay.....	252 83
October 19—P. J. Carlin & Co., Ninth payment on contract, Museum of Arts and Sciences.....	21,589 15
October 22—The Eastern Stone Company, Tenth payment on contract for Archways, Bay Ridge Parkway.....	\$5,041 62
October 24—E. Belcher Hyde, Volume I., Queens County Atlas.....	25 00
October 24—William E. Verity, Lumber.....	289 50
October 30—John Condon, 164,000 Imported Bulbs.....	2,280 00
November 7—James Smith, 50 truck-loads of Manure.....	62 50
November 7—Timothy Conklin, 75 loads of Manure.....	93 75
November 7—C. H. Joosten, Narcissus Bulbs .....	9 50
November 7—Henry A. Dreer, Begonias.....	18 00
November 7—Peter Henderson & Co., Grass Seed.....	39 45
November 7—Joseph A. Manda, Lilly Roots.....	145 00
November 7—Isaac Harris, Furnishing and Laying Cement Pipe.....	4,436 98
November 7—Brooklyn Daily Eagle, Golf Permits and Voucher Schedules .....	13 00
November 7—Francis X. Kerrigan, Chief Clerk, Disbursements of Prospect Park Office.....	118 45
November 8—John F. Maillie, Trap Rock.....	1,918 36
November 12—Robert T. Brown, Secretary, Disbursements of Borough Hall Office.....	18 32
November 12—James T. Shillinglaw, Horse Medicines.....	9 80
November 12—J. K. Brown & Co., Use of rigging, for erecting derrick.....	36 00
November 12—The I. S. Remson Manufacturing Company, Repairing, painting and varnishing Buggy.....	50 00
November 13—P. Kane Harness Manufacturing Company, Repairs to Harness .....	33 65
November 14—The New York and New Jersey Telephone Company, Telephone Service.....	98 55
November 14—F. N. Dubois & Co., Manhole Heads and Basin Gratings .....	136 50
November 14—The Manhattan Supply Company, Hardware, etc.....	245 50
November 14—William E. Verity, Lumber.....	240 75

November 14—Ruwe Bros., Blacksmithing Materials.....	265 59
November 14—Andrew W. Martin, Paints and Kerosene Oil.....	71 25
November 14—Frank D. Creamer & Co., Cement and Brick.....	125 18
November 14—C. H. Joosten, Bamboo Plant Stakes.....	15 00
November 14—Jacob Muller, One set of Harness.....	50 00
November 14—Keuffel & Esser Company, One Leveling Rod.....	4 80
November 14—C. W. Keenan, Lamp Black.....	11 25
November 14—Tefft, Weller & Co., Swiss, for Curtains and Curtain Loops .....	11 20
November 14—William Ineson, Algae Jell.....	37 50
November 14—Pittsburgh Plate Glass Company, 100 boxes of Glass....	428 00
November 14—Samuel W. Cornell, Hardware, etc.....	68 53
November 14—Thomas Monahan, Seventh payment on contract, Bay Ridge parkway .....	3,876 82
November 19—Geo. M. Eddy & Co., Steel Tapes and Repairs.....	53 00
November 19—Keuffel & Esser Company, Drawing Materials.....	20 36
November 19—Ronalds & Johnson Company, Pipe, for Greenhouse....	5 67
November 19—Ruwe Bros., Blacksmithing Materials.....	12 60
November 19—Frank D. Creamer & Co., Lime and Whiting.....	16 26
November 19—Samuel W. Cornell, Rubber Boots, etc.....	25 50
November 19—Jacob Muller, Florida Sheepswool Sponges.....	10 50
November 19—J. S. Woodhouse, one Lawn Roller.....	39 90
November 19—William J. Hartman, Excavation at College Point Park..	102 00
November 19—William J. Hartman, Top Soil for College Point Park...	168 00
November 19—Brooklyn District Telegraph Co., Messenger Service....	5 45
November 19—Isaac Harris, Roa Hook Gravel.....	4,389 00
November 23—Martin B. Brown Co., Voucher Schedule Blanks.....	6 60
November 23—Edison Electric Illuminating Co., Electric Light in Pros- pect Park .....	152 26
November 23—The John H. Shults Co., Bread for Animals.....	13 50
November 23—Robert H. Taylor, Milk for Animals.....	20 46
November 23—Charles J. Dunne, Meat and Fish for Animals.....	26 04
November 23—Thomas Rice, 50 truck-loads of Manure.....	62 50
November 23—Timothy Conklin, 25 truck-loads of Manure.....	31 25
November 23—Flatbush Water Works Co., Water for sprinkling Fort Hamilton avenue .....	50 00
November 23—Flatbush Water Works Co., Water at Willink Entrance..	16 77
November 23—The Brooklyn Union Gas Co., Gas at Litchfield Mansion	23 94
November 25—Photogravure and Color Co., Music Programs.....	447 60
November 25—Frost Bros., Coal.....	994 40

November 25—The I. S. Remson Manufacturing Co., Repairing Buggy, etc. ....	68 10
November 25—N. Y. & N. J. Telephone Co., Telephone Service.....	99 96
November 25—William E. Verity, Lumber.....	3 00
November 25—D. G. White, 100 truck-loads of Potting Soil.....	300 00
November 25—F. Donovan & Son, Corn, Screenings, etc.....	70 15
November 25—Isaac Harris, Blue Limestone Screenings.....	589 40
November 25—Isaac Harris, Roa Hook Gravel.....	1,237 50
November 25—Isaac Harris, Building two Manholes.....	16 00
November 25—William Churchill Oastler, one Road Sweeper.....	375 00
November 25—John A. Scollay, Steam Heat in Cactus House.....	173 00
November 25—John A. Scollay, Heating Pipes in Cactus House.....	248 00
November 26—Ruwe Bros., Blacksmithing Materials.....	185 34
November 26—F. Donovan & Son, Hay, Oats and Corn.....	405 69
November 26—George Deyo, Agent and Warden, Wheelbarrows.....	23 48
December 3—Flatbush Water Works Co., Water at Willink Entrance..	10 12
December 3—The Brooklyn Union Gas Co., Gas at Litchfield Mansion.	13 95
December 3—John M. Fox, Grass Sod.....	15 00
December 3—W. A. Manda, Caladiums.....	36 00
December 3—Oak Park Nurseries, Trees.....	209 00
December 3—Thomas M. DeLaney & Co., Plumbing Materials.....	32 07
December 3—D. W. Binns, Castings, etc.....	69 68
December 3—W. L. Glidden, two Ladders.....	8 00
December 3—R. J. Macaulay, Glass for Greenhouse.....	14 00
December 3—Rumsey Pump and Machine Co., Pump, Hose Couplings, etc. ....	33 00
December 3—Watson & Pittinger, Lumber.....	100 00
December 3—Ruwe Bros., Cast Steel, Knives, etc.....	120 00
December 3—N. Ryan, Paving Gravel.....	9 11
December 3—C. W. Keenan, Lamp Black.....	11 25
December 3—A. H. Hews & Co., Flower Pots.....	242 00
December 3—William E. Verity, Lumber.....	43 17
December 3—Siebrecht & Son, Tuffa Rock.....	204 00
December 3—Henry R. Worthington, Pump for Engine at Well.....	84 00
December 3—C. H. Joosten, Bulbs for Brooklyn Heights Parks.....	81 70
December 5—F. N. DuBois & Co., Sewer Pipe.....	16 50
December 5—Samuel W. Cornell, Garden Spades, etc.....	46 06
December 5—Jackson's Mantel and Grate Works, Fireplace.....	5 50
December 5—James H. English & Son, Three Receipt Books.....	10 50
December 5—Charles J. Dunne, Meat and Fish, for Animals.....	25 20
December 5—Robert H. Taylor, Milk, for Animals.....	19 68

December 5—The John H. Shults Company, Bread, for Animals.....	13 50
December 5—The Brooklyn Union Gas Company, Gas, at Litchfield Mansion .....	18 27
December 5—Adolph Lange, Electric work at Farm House.....	17 60
December 5—F. V. Lindon, Repairing and Winding Clocks.....	26 00
December 5—W. F. Doyle, D. V. S., Veterinary Services.....	87 00
December 6—Robert T. Brown, Secretary, Disbursements of Borough Hall Office .....	24 05
December 6—The P. Kane Harness Manufacturing Company, Har- ness Repairs .....	6 50
December 6—John Davies & Son, Slides, for Ice Plane.....	15 00
December 6—Donovan & Son, Corn and Meal.....	\$28 15
December 6—F. Donovan & Son, Oats, Hay, Straw, etc.....	271 49
December 9—August Willie, Painting Iron Fences, etc.....	1,772 55
December 9—Thomas Monahan, Work on Bay Ridge Parkway.....	3,228 93
December 10—Francis X. Kerrigan, Chief Clerk, Office Disbursements.	94 52
December 12—Brooklyn District Telegraph Company, Messenger Ser- vice .....	9 00
December 12—The Kings County Gas & Illuminating Company, Rais- ing Gas Main, etc.....	294 45
December 12—Edison Electric Illuminating Company, Electric Light...	54 10
December 12—Flatbush Water Works Company, Water, at Willink Entrance .....	3 99
December 12—Flatbush Water Works Company, Water, for sprinkling Fort Hamilton avenue.....	50 00
December 12—Keuffel & Esser Company, one set of Drawing Instru- ments .....	51 32
December 12—Jacob Muller, one set of Harness.....	60 00
December 12—Brooklyn Alcatraz Asphalt Company, Retained percent- age on contract, Coney Island Concourse.....	292 31
December 18—Charles Zeller & Son, Plants.....	25 25
December 18—Williamsburg City Fire Insurance Company, Insurance on houses on the Shore road.....	174 75
December 18—Gillis & Geoghegan, Grate, etc., for Boiler at Mansion...	28 95
December 18—James Lynch, Cleaning Steps, etc., at Fort Greene.....	298 00
December 18—Eureka Blotter Bath Company, one Eureka Copying Bath	4 50
December 20—National Trading Company, Sewer Pipe Connections at Park Circle.....	11 56
December 20—John A. Scollay, New sections for Boiler at Greenhouse.	148 00
December 20—John Claffy's Sons, one side of Hoisting Machine.....	15 00
December 20—Richardson & Boynton Company, Grate, etc., for Furnace	4 75

December 20—Ruwe Bros., Assorted Iron, Hubs and Spokes.....	49 80
December 20—Jacob Muller, Whips and Horse Covers.....	40 75
December 20—C. H. Joosten, Plants.....	5 00
December 23—Andrew W. Martin, Oil, White Lead, etc.....	214 30
December 23—Frank D. Creamer & Co., Portland Cement.....	31 68
December 23—John F. Warth & Bro., Refilling Broom for Sweeping Machine .....	20 00
December 23—Pittsburgh Plate Glass Company, Mirror, for Greenhouse	8 55
December 23—National Trading Company, Sewer Pipe.....	22 00
December 23—Richard E. Thibaut, Wall Paper.....	6 84
December 26—Thomas M. DeLaney & Co., Water Connections, at Lake	4 20
December 26—The Union Stove Works, Stove, for Highland Park Shelter .....	5 25
December 26—Henry Hawkes, Jr., Repairing Water Main.....	28 35
December 26—N. Y. & N. J. Telephone Co., Telephone Service.....	101 11
December 27—Frost Bros., Coal .....	862 30
December 30—William E. Verity, Lumber.....	2,117 96
December 30—Isaac Harris, Roa Hook Gravel.....	3,403 13
December 30—Isaac Harris, Limestone Screenings.....	607 60
December 30—Frank D. Creamer & Co., Brick and Cement.....	25 98
December 30—Andrew W. Martin, Kerosene Oil.....	17 25
December 30—F. N. Dubois & Co., Plumbing Materials.....	250 02
December 30—The Brooklyn Union Gas Co., Gas., at Litchfield Man- sion .....	18 54
December 30—A. B. Smith, Repairs to Carriage.....	65 00
December 30—Pioneer Machine Works, Repairs to Steam Roller, etc....	53 70
December 30—Sebastian Wagon Co., One Sand Sprinkler.....	400 00
December 30—Ruwe Bros., Cast Steel and Iron.....	66 00
December 30—William A. Lewis, Painting Flag-poles.....	180 00
December 30—George Deyo, Agent and Warden Pails, Cuspidors, etc..	13 16
December 30—J. Warren Mead, Agent and Warden, Waste Paper Bas- kets. ....	3 35
December 30—Nassau Fire Insurance Co., Insurance on Building in Bed- ford Park .....	25 00
December 30—Isaac Harris, Cement Sewer Pipe.....	155 46
December 30—William Cowley, Clipping Horses.....	24 00
December 30—William P. Mitchell & Son, Proofs of Museum Contract.	36 00
December 30—Brooklyn Daily Eagle, Contracts and Proposal Blanks...	91 00
December 30—Frederick W. Kelsey, Azaleas.....	75 00
December 30—Joseph A. Manda, Peat Fibre, Moss, etc.....	60 25

December 31—Eastern Stone Co., Final Payment on Contract for Arch-ways, Bay Ridge parkway (Shore drive).....	18,028 18
December 31—Robert T. Brown, Secretary, Office Disbursements.....	35 17
December 31—William J. Buckley, Work on Highland Boulevard.....	727 20
December 31—Brooklyn District Telegraph Co., Messenger Service.. ..	7 00
December 31—John F. Maillie, Top Soil for Ocean Parkway.....	490 80

#### SALARY PAY-ROLLS FOR THE YEAR 1901.

Salary Pay-roll for January....\$1,739 97	Salary Pay-roll for July.....	1,699 97
Salary Pay-roll for February... 1,699 97	Salary Pay-roll for August.....	1,699 97
Salary Pay-roll for March..... 1,699 97	Salary Pay-roll for September... 1,699 97	
Salary Pay-roll for April..... 1,699 97	Salary Pay-roll for October.....	1,699 97
Salary Pay-roll for May..... 1,699 97	Salary Pay-roll for November... 1,699 97	
Salary Pay-roll for June.....1,699 97	Salary Pay-roll for December... 1,658 39	

#### BROOKLYN INSTITUTE PAY-ROLLS.

Brooklyn Institute Pay-roll, January.....	\$4,622 21
Brooklyn Institute Pay-roll, February.....	5,135 51
Brooklyn Institute Pay-roll, March .....	4,830 71
Brooklyn Institute Pay-roll, April .....	4,923 97
Brooklyn Institute Pay-roll, May.....	6,946 87
Brooklyn Institute Pay-roll, June .....	6,608 02
Brooklyn Institute Pay-roll, July .....	3,786 91
Brooklyn Institute Pay-roll, August .....	3,251 78
Brooklyn Institute Pay-roll, September .....	3,369 99
Brooklyn Institute Pay-roll, October .....	3,573 71
Brooklyn Institute Pay-roll, November.....	3,748 62

Respectfully submitted,

ROBERT T. BROWN Secretary.

#### WEEKLY PAY-ROLL.

January 4—Weekly pay-roll, No. 1043.....	\$2,642 23
January 11—Weekly pay-roll, No. 1044.....	4,047 78
January 18—Weekly pay-roll, No. 1045.....	4,506 06
January 25—Weekly pay-roll, No. 1046.....	4,323 71
February 1—Weekly pay-roll, No. 1047.....	4,640 27
February 8—Weekly pay-roll, No. 1048.....	4,331 16
February 15—Weekly pay-roll, No. 1049.....	4,349 36



February 22—Weekly pay-roll, No. 1050.....	4,451 63
March 1—Weekly pay-roll, No. 1051.....	4,739 63
March 8—Weekly pay-roll, No. 1052.....	4,749 38
March 15—Weekly pay-roll, No. 1053.....	4,917 64
March 22—Weekly pay-roll, No. 1054.....	5,191 38
March 29—Weekly pay-roll, No. 1055.....	5,761 75
April 5—Weekly pay-roll, No. 1056.....	5,382 76
April 12—Weekly pay-roll, No. 1057.....	5,608 77
April 19—Weekly pay-roll, No. 1058.....	1,243 78
April 26—Weekly pay-roll, No. 1059.....	5,694 06
May 3—Weekly pay-roll, No. 1060.....	6,314 44
May 10—Weekly pay-roll, No. 1061.....	5,510 95
May 17—Weekly pay-roll, No. 1062.....	6,612 14
May 24—Weekly pay-roll, No. 1063.....	6,348 36
May 31—Weekly pay-roll, No. 1064.....	5,524 55
June 7—Weekly pay-roll, No. 1065.....	1,594 88
June 14—Weekly pay-roll, No. 1066.....	6,947 88
June 21—Weekly payroll, No. 1067.....	\$7,045 15
June 28—Weekly pay-roll, No. 1068.....	6,991 35
July 5—Weekly pay-roll, No. 1069.....	1,231 61
July 12—Weekly pay-roll, No. 1070.....	6,714 24
July 19—Weekly pay-roll, No. 1071.....	6,917 31
July 26—Weekly pay-roll, No. 1072.....	6,780 93
August 2—Weekly pay-roll, No. 1073.....	6,859 57
August 9—Weekly pay-roll, No. 1074.....	6,564 43
August 16—Weekly pay-roll, No. 1075.....	6,737 80
August 23—Weekly pay-roll, No. 1076.....	6,761 17
August 30—Weekly pay-roll, No. 1077.....	6,611 49
September 6—Weekly pay-roll, No. 1078.....	6,296 60
September 13—Weekly pay-roll, No. 1079.....	6,993 10
September 20—Weekly pay-roll, No. 1080.....	6,014 81
September 27—Weekly pay-roll, No. 1081.....	7,027 73
October 4—Weekly pay-roll, No. 1082.....	6,969 09
October 11—Weekly pay-roll, No. 1083.....	7,129 55
October 18—Weekly pay-roll, No. 1084.....	6,373 68
October 25—Weekly pay-roll, No. 1085.....	7,213 05
November 1—Weekly pay-roll, No. 1086.....	7,211 68
November 8—Weekly pay-roll, No. 1087.....	7,135 55
November 15—Weekly pay-roll, No. 1088.....	7,116 24
November 22—Weekly pay-roll, No. 1089.....	7,170 06
November 29—Weekly pay-roll, No. 1090.....	6,238 92

December 6—Weekly pay-roll, No. 1091.....	6,273 44
December 13—Weekly pay-roll, No. 1092.....	6,591 80
December 20—Weekly pay-roll, No. 1093.....	6,416 10
December 31—Weekly pay-roll, No. 1094.....	<u>          </u>

Respectfully,

FRANCIS X. KERRIGAN, C. C.

## BOROUGH OF THE BRONX.

New York, December 31, 1901.

HON. ROBERT A. VAN WICK, *Mayor*:

Sir—I have the honor to submit herewith my report of the operations of the Department of Parks, Borough of The Bronx, for the year 1901.

1. Financial.
2. Operations.
3. Report of Chief Engineer.
4. Report of Director of Botanical Gardens.
5. Report of Director of Zoological Gardens.

### I. FINANCIAL EXPENDITURES.

#### (a) Appropriation Accounts.

Title of Appropriation.	Amount of Appropriation.	Expenditures.	Balance.
Maintenance and Construction.....	\$246,600 00	\$245,516 40	-\$1,083 60
Administration .....	12,680 00	12,571 89	108 11
Maintenance of Botanical Gardens.....	55,000 00	55,000 00	.....
Maintenance of Zoological Gardens.....	65,000 00	55,639 19	9,360 81
Surveys, Maps and Plans.....	10,000 00	9,819 19	180 81
Music .....	12,480 00	12,475 00	5 00
Contingencies .....	1,500 00	1,429 51	70 49

## (b) Bond Accounts.

Title of Account.	Amount of Appropriation.	Balance on Hand January 1, 1901.	Expenditures 1901.	Balance.
Construction and Maintenance of Public Parkways.				
Bronx and Pelham parkway, construction of roadway, etc. ....	\$100,000 00	\$645 59	\$645 59	.....
Mosholu parkway .....	4,000 00	615 75	615 75	.....
Pelham Bay Park, Prospect Hill road.....	14,000 00	2,554 24	2,554 24	.....
Macadamizing roads in Pelham Bay Park.....	65,908 72	871 66	871 66	.....
Bronx and Pelham parkway, extension through Bronx Park .....	44,000 00	793 61	793 61	.....
Mosholu parkway, Van Cortlandt Park, etc....	10,000 00	1,586 24	1,586 24	.....
In Bronx Park—Improving Old Boston road...	10,000 00	71	.....	\$0 71
In Van Cortlandt Park—Improving Mosholu avenue, etc.....	6,000 00	60	.....	60
In Van Cortlandt Park—Improving Grand avenue, etc. ....	4,500 00	95	.....	95
Improving Bronx and Pelham parkway.....	109,455 00	44,862 27	32,198 79	12,663 43
Improving Bronx and Pelham parkway.....	172,000 00	172,000 00	83,958 84	88,041 16
In Bronx Park—For regulating, grading and paving the existing roads near the Botanical Garden .....	34,000 00	10,815 55	10,815 55	.....
In Bronx Park—Grading, paving and improving existing roads from Bronx and Pelham parkway to and around nursery.....	12,000 00	7,696 04	7,696 04	.....
For improving existing roads in Bronx Park...	22,000 00	11,595 30	11,595 26	04
For improving existing roads in Pelham Bay Park .....	6,000 00	20 88	20 88	.....
Improvement of Parks, Parkways and Drives.				
St. Mary's Park—Improvement of.....	21,000 00	113 42	35 80	77 62
Cedar Park—Improvement of.....	15,000 00	34	.....	34
Paving, etc., Pelham Bridge road, Eastchester creek, etc. ....	29,000 00	57	.....	57
Constructing driveways and paths in the Botanical Garden .....	15,000 00	06	.....	06
Improving Bronx and Pelham parkway, between easterly line Bronx Park and easterly line Bear Swamp road.....	50,000 00	48	.....	48
Filling in, etc., certain lands, Van Cortlandt Park, for Colonial Garden.....	15,000 00	20	.....	20
Claremont Park—Improving, etc.....	15,000 00	464 23	115 91	348 42
Constructing cycle and bridle paths on Bronx and Pelham parkway.....	75,000 00	8,092 66	7,527 13	565 53
Improving small park, westerly side Fulton avenue, between One Hundred and Sixty-ninth and One Hundred and Seventieth streets..	4,045 33	174 60	11 64	162 96

Title of Account.	Amount of Appropriation.	Balance on Hand January 1, 1901.	Expenditures 1901.	Balance.
Botanical Museum and Herbarium—Construction of .....	516,500 00	8,654 65	8,654 65	.....
For improving that portion of Crotona Park in which is located a public building.....	30,000 00	471 67	94 31	377 36
Constructing, etc., park, East One Hundred and Ninety-second street and Kingsbridge road.	10,000 00	01	.....	01
Spuytten Duyvil Park—Constructing and improving of .....	150,000 00	3 05	.....	3 05
*New York Zoological Garden Fund.....	374,163 50	298,018 56	195,444 62	102,573 94
Repairs to Pelham Bridge.....	6,000 00	18	.....	18
Skate and golf house in Van Cortlandt Park—Erection of .....	20,000 00	15,499 55	15,488 23	11 32
Botanical Garden in Bronx Park—Improving, developing and erection of additional buildings .....	200,000 00	200,000 00	133,591 24	66,408 76
For improving public park at the junction of East One Hundred and Eighty-first street, Sedgwick and Cedar avenues, Bronx.....	10,000 00	10,000 00	10,000 00	.....
Bridge over Eastchester Bay, in Pelham Bay Park, Borough of The Bronx—Construction of .....	15,000 00	16,000 00	6,067 48	8,932 52

\* The amount, \$140,000, which was appropriated to the account, New York Zoological Garden Fund, in year 1901, added to amount of appropriation and balance on hand January 1, 1901.

## RECEIPTS.

### For Rents and Privileges, 1901.

January .....	\$879 66
February .....	572 16
March .....	551 49
April .....	680 00
May .....	947 31
June .....	560 00
July .....	911 49
August .....	523 65
September .....	594 82
October .....	655 16
November .....	507 98
December .....	701 32
Total .....	<u>\$8,085 04</u>

## List of Buildings in Respective Parks and Their Uses.

Title and Location.	Use.
Zbrowski Mansion, Claremont Park.....	Offices of Department of Parks.
Stable, Claremont Park.....	Department stables.
Lorillard Mansion, Bronx Park.....	Police Department.
Lorillard Mansion, Bronx Park.....	Police stable.
One house, Pelham Bay Park.....	Police Department.
Stable, Pelham Bay Park.....	Police stable.
Van Cortlandt Manor House, Van Cortlandt Park.	Society of Colonial Dames.
Skate and Golf house, Van Cortlandt Park.....	Skate and Golf house.
Hunter Mansion, Pelham Bay Park.....	Society of Little Mothers.
Firman Mansion, Pelham Bay Park.....	Society of St. Vincent de Paul.
One house, St. Mary's Park.....	Foreman and Keeper's house.
Gatehouse, Bronx Park.....	Foreman of Gardeners' house.
Snuff mill, Bronx Park.....	Workshop for Mechanics.

## Houses Rented.

Location.	Number of Houses.
Pelham Bay Park .....	33
Van Cortlandt Park .....	2
Claremont Park .....	1
Macomb's Dam Bridge Park.....	13
Bronx Park .....	1
Poe Park .....	1

## Concerts, 1901.

Location and Day.	Leader.	Number of Concerts.	Average Attendance.
Cedar Park, Saturday.....	J. H. Miller.....	12	1,200
Crotona Park, Saturday.....	Joseph Knittle .....	12	2,900
Van Cortlandt Park, Saturday.....	August Stover .....	12	2,500
St. Mary's Park, Sunday.....	Frederick W. Hager ....	12	9,500
Macomb's Dam Bridge Park, Sunday.....	Peter Berlinghoff .....	12	1,200
Claremont Park, Sunday.....	George Friedgen .....	12	2,900
Bronx Park, Sunday.....	Thomas F. Usher .....	12	7,500
Pelham Bay Park, Sunday.....	Richard E. Sause.....	12	2,000

## Skating.

Date.	Park.	Attendance.
Jan. 2, 1901.	Van Cortlandt Park.....	2,000
Jan. 3, 1901.	Van Cortlandt Park.....	2,000
Jan. 4, 1901.	Van Cortlandt Park.....	3,000
Jan. 5, 1901.	Van Cortlandt Park.....	10,000
Jan. 6, 1901.	Van Cortlandt Park.....	15,000
Jan. 7, 1901.	Van Cortlandt Park.....	2,000
Jan. 8, 1901.	Van Cortlandt Park.....	2,000
Jan. 14, 1901.	Van Cortlandt Park.....	2,500
Jan. 19, 1901.	Van Cortlandt Park.....	3,000
Jan. 20, 1901.	Van Cortlandt Park.....	10,000
Jan. 21, 1901.	Van Cortlandt Park.....	1,000
Jan. 23, 1901.	Van Cortlandt Park.....	1,500
Jan. 24, 1901.	Van Cortlandt Park.....	2,000
Jan. 26, 1901.	Van Cortlandt Park.....	5,000
Jan. 27, 1901.	Van Cortlandt Park.....	10,000
Jan. 28, 1901.	Van Cortlandt Park.....	2,000
Jan. 29, 1901.	Van Cortlandt Park.....	2,500
Jan. 30, 1901.	Van Cortlandt Park.....	1,000
Jan. 31, 1901.	Van Cortlandt Park.....	2,500
Feb. 1, 1901.	Van Cortlandt Park.....	3,000
Feb. 2, 1901.	Van Cortlandt Park.....	8,000
Feb. 3, 1901.	Van Cortlandt Park.....	10,000
Feb. 6, 1901.	Van Cortlandt Park.....	500
Feb. 7, 1901.	Van Cortlandt Park.....	1,500
Feb. 8, 1901.	Van Cortlandt Park.....	2,000
Feb. 10, 1901.	Van Cortlandt Park.....	3,000
Feb. 11, 1901.	Van Cortlandt Park.....	1,000
Feb. 12, 1901.	Van Cortlandt Park.....	6,000
Feb. 13, 1901.	Van Cortlandt Park.....	1,000
Feb. 14, 1901.	Van Cortlandt Park.....	1,500
Feb. 15, 1901.	Van Cortlandt Park.....	2,000
Feb. 16, 1901.	Van Cortlandt Park.....	3,000
Feb. 17, 1901.	Van Cortlandt Park.....	5,000
Feb. 21, 1901.	Van Cortlandt Park.....	2,000
Feb. 22, 1901.	Van Cortlandt Park.....	8,000
Feb. 23, 1901.	Van Cortlandt Park.....	3,000
Feb. 24, 1901.	Van Cortlandt Park.....	5,000
Feb. 25, 1901.	Van Cortlandt Park.....	1,000
Feb. 26, 1901.	Van Cortlandt Park.....	500
Feb. 27, 1901.	Van Cortlandt Park.....	1,000
Feb. 28, 1901.	Van Cortlandt Park.....	1,000
Mar. 1, 1901.	Van Cortlandt Park.....	500
Mar. 3, 1901.	Van Cortlandt Park.....	5,000
Dec. 7, 1901.	Van Cortlandt Park.....	4,000
Dec. 8, 1901.	Van Cortlandt Park.....	10,000
Dec. 9, 1901.	Van Cortlandt Park.....	2,000
Total, 47 days' skating.		
Jan. 6, 1901.	Crotona Park.....	5,000
Jan. 20, 1901.	Crotona Park.....	600
Jan. 21, 1901.	Crotona Park.....	1,000
Feb. 7, 1901.	Crotona Park.....	2,000
Feb. 9, 1901.	Crotona Park.....	4,000

Date.	Park.	Attendance.
Feb. 10, 1901.	Crotona Park.....	6,000
Feb. 11, 1901.	Crotona Park.....	4,500
Feb. 12, 1901.	Crotona Park.....	7,000
Feb. 13, 1901.	Crotona Park.....	1,000
Feb. 14, 1901.	Crotona Park.....	2,500
Feb. 15, 1901.	Crotona Park.....	2,500
Feb. 16, 1901.	Crotona Park.....	2,000
Feb. 17, 1901.	Crotona Park.....	1,000
Feb. 21, 1901.	Crotona Park.....	1,000
Feb. 22, 1901.	Crotona Park.....	4,000
Feb. 23, 1901.	Crotona Park.....	5,000
Feb. 24, 1901.	Crotona Park.....	7,000
Feb. 26, 1901.	Crotona Park.....	1,000
Feb. 27, 1901.	Crotona Park.....	2,000
Feb. 28, 1901.	Crotona Park.....	3,500
Mar. 1, 1901.	Crotona Park.....	1,000
Mar. 3, 1901.	Crotona Park.....	2,000
Mar. 4, 1901.	Crotona Park.....	2,500
Mar. 6, 1901.	Crotona Park.....	3,000
Mar. 8, 1901.	Crotona Park.....	1,000
Dec. 23, 1901.	Crotona Park.....	4,000

Total, 26 days' skating.

#### Permits.

Park.	Golf.	Lawn Tennis.	Baseball.	Football.
Van Cortlandt .....	1,940	8	8	2
Bronx .....	....	4	3	..
Claremont .....	....	22	8	2
St. Mary's .....	....	6	..	..
Crotona .....	....	10	12	4
Cedar .....	....	4	..	..
Pelham Bay .....	285	..	2	..
Total.....	2,225	54	33	8

For May parties in the several parks.....	902
For school picnics.....	194
For family and social gatherings.....	280
For miscellaneous purposes .....	465

Total..... 1,841

Grand total, 4,161.

## Monthly Average of Employees.

Month.	Office.	Engi- neers, etc.	Superintendent, Foremen, etc.	Teams.	Mechanics.	Laborers.
January .....	7	32	17	1	20	78
February .....	7	31	43	8	21	176
March .....	7	31	43	43	29	251
April .....	7	33	43	45	29	247
May .....	7	34	43	47	30	272
June .....	7	34	41	48	30	276
July .....	7	34	44	58	30	277
August .....	7	34	45	58	30	278
September .....	7	33	47	59	30	266
October .....	7	32	46	56	30	275
November .....	7	30	46	56	29	269
December .....	8	31	40	38	26	267

Total employees' average, 396.

## 2. OPERATIONS.

*Maintenance and Construction Account.*

As stated in former reports, the ordinary work of maintenance includes the repair ing of all parkways, driveways, roads, paths, etc., the cleaning of the same of snow in winter, and cleaning of all dirt, leaves and deposits of all kinds during the summer. The sprinkling of all parkways, drives and roads during nine months of the year. The removal of all dead and dangerous trees. The pruning and care of all trees, shrubs and plants. The mowing of all lawns, meadows, etc. The repairing and paint ing of all buildings requiring the same. The building and repairing of fences, railings, work boxes, music stands, etc. The repairing and painting of settees and benches. The cleaning of sewers, basins and culverts and all the incidental work necessary for the improvement and maintenance of the large area under the jurisdiction of this Department.

In addition to the ordinary work of maintenance above specified:

*Pelham Bay Park—1,756 Acres.*

Road from Bartow Station to City Island, regraded wherever necessary and re-surfaced; nearly 800 yards of screenings were used and entire road thoroughly rolled with steam roller.

The Twin Island road, repaired and resurfaced for a distance of 4,400 linear feet.



Constructed a new macadam road on Delaney place 500 feet long, 15 feet wide. Repaired and resurfaced Prospect Hill road with new trap rock and screenings for a distance of one and a half miles and thoroughly rolled same with steam roller.

Repaired and resurfaced Eastern Boulevard with trap rock and screenings for a distance of 2,700 linear feet.

Repaired and rolled Baychester road for a distance of 2,400 linear feet.

Repaired, resurfaced and rolled Pelham Parkway 500 feet. Finished Furman lane for a distance of 2,550 linear feet with new macadam pavement.

Mowed 80 acres of hay, cured same and delivered the hay to Claremont Park and deer inclosure in Van Cortlandt Park.

Completed golf links for the nine-hole course and opened same for public use.

Opened and completed drain 4 feet deep and 1,000 feet long in upper section of park.

#### *Van Cortlandt Park—1,132.25 Acres.*

The regulating and grading of the grounds surrounding the golf and skate house.

Repairing and putting in condition Tremper house.

Repairing and resurfacing, wherever required, five miles of macadam roads.

Repairing 2,000 feet of macadam paths and sidewalks.

#### *Golf Links.*

I beg to submit the report of work done outside the regular maintenance of the links.

First Link—Moved tee in order to change angle of play so as to prevent balls going on road. Removed numerous small stones. Took out ten stumps of trees. Cleared underbrush to east of hole so as to widen course.

Second Link—Lengthened this link 100 yards. Blasted out rocks in line of play and covered same with loam and seeded.

Third Link—Carting 100 yards of loam to cover the approach for this green, seeding and rolling same.

Fourth Link—Cleared underbrush to right of this link for a space of 140 yards by 15 yards.

Fifth Link—Taking out rock from the approach to this hole, leveling surface of same and sodding bare patches.

Sixth Link—Taking out rock through fair green and sodding bunker in front of depot.

Seventh Link—Filled bunker with sand, built a retaining wall to keep water from road and neighboring hills off the course, made the road along this link 3 feet wider,

cut a ditch to carry off waterflow 300 yards long and 18 inches wide and 15 inches deep.

Eighth Link—Continued the retaining wall and ditch for another 75 yards, built a new green all ready for sodding on the side of a slope, requiring it to be sunk or dug out on one side 5 feet and raised 2 feet on the other, and carted 100 loads of loam for same.

Ninth Link—Clearing out large rocks through fair green and repairing bunkers, continued ditch 2 feet wide 2 feet deep and 50 yards long.

Tenth Link—Building a new tee and taking out rocks in line of play.

Eleventh Link—Removed loose rocks from old stone wall, took out rocks at back of green and repaired trap bunker near green.

Twelfth Link—Moved a tee in order to prevent balls from being driven into woods, cleared a space to right of fair green so as to widen course and lengthened link 20 yards.

Thirteenth Link—Dug a ditch 2 feet wide by 2 feet deep 100 yards long, connecting brook.

Fourteenth Link—Cleared a space along railroad of underbrush so as to widen course 300 yards long 15 yards wide, leveled and mowed.

Fifteenth Link—Removed rocks between brook and putting green.

Sixteenth Link—Continued widening link along railway fence 200 yards.

Seventeenth Link—Repaired bunkers, removed loose stones, carted sand into bunkers.

Eighteenth Link—Filled trap bunker with sand, widened this link by carting dirt and filling in low land near lake, together with covering putting greens with 50 loads of manure, etc.

(Signed) VALENTINE FLOOD, Foreman.

#### *Greenhouses and Department Nursery.*

The work in connection with the greenhouses, propagating house, hot beds and nursery has been so thoroughly described in previous reports that it seems to me unnecessary to revert to the plant. Suffice it to say that during the year additions have been made both in the matter of constructing and stocking that have added materially to the value of the plant and the collections.

A new fernery has been constructed, a new rock garden formed and a sub-tropical garden instituted, all of which are both ornamental and useful.

Throughout the year tree planting, shrub planting, the laying out and stocking of flower beds in the several parks was largely increased.

The stock has doubled during the year, and there is everything on hand requisite for the coming year. At a comparatively small cost the collection is one of the most attractive in the country, and the Department will be enabled to show the most gratifying results in all branches for the season of 1902.

*Bronx Park—Area 661.68 Acres.*

Resurfaced Bronx and Pelham parkways with trap rock and screenings the whole length and rolling same to line of Pelham Bay Park.

Constructed cycle paths on north side of Bronx and Pelham parkways 7,200 feet long 10 feet wide.

Constructed path south side of Bronx and Pelham parkways facing Zoological Gardens, 1,200 feet long 17 feet wide.

Repaired and resurfaced Boston road, through park, distance one mile, and rolled same with steam roller.

Built new walk 500 feet long 9 feet wide.

Filled in around nursery 8,000 cubic yards.

Paved gutters 5,400 linear feet.

Excavated for new lake, grubbing, removing scrub trees and excavating 4,000 cubic yards.

Constructing and repairing new roads and paths in Botanical Garden, 4,000 linear feet roads, 1,800 feet paths.

*Crotona Park—Area 154.60 Acres.*

The low grounds on the east side of Crotona avenue, at One Hundred and Seventy-first street, a space 600 feet long 275 feet wide and to a depth of 9 feet was filled and graded.

The grounds on the west side of Crotona avenue and One Hundred and Seventy-first street, 600 feet long 150 feet wide, to a depth of 3 feet were filled and graded. More than 100 loads of manure were distributed on the grounds above mentioned and then grass seed was sowed, so that an unhealthy section of the park was made a fine lawn.

Paths 900 feet long and 7 feet wide were constructed through the above section.

In addition to the above over 1,600 cubic yards of filling was used in various sections of the park.

Over 2,000 feet of new paths were made and new gutters constructed where required.

*Claremont Park—Area 38 Acres.*

A new macadam road from the Mansion was constructed, 400 feet long and 16 feet wide.

A new macadam road from Belmont street to Morris avenue was also constructed, 818 feet long and 16 feet wide, and a connecting road to the above macadam 125 feet long and 16 feet wide was also completed.

From the Mansion to the southwest section of the park a new macadam road was laid out, of which 350 linear feet, 16 feet wide, was completed, and 300 feet has yet to be covered with screenings and rolled.

A new picket fence 385 feet long on Morris avenue was put up.

Three hundred and eighty-three feet of new paths 8 feet wide, and 225 feet of paths 7 feet wide were also completed.

The section adjoining Morris avenue on the west side of the park was filled, measuring 100 feet long by 100 feet, with an average depth of 12 feet.

The grounds north and south of the main entrance were reterraced and resodded wherever necessary.

*St. Mary's Park—Area 28.70 Acres.*

The old site of the pond facing St. Ann's avenue, an area of 800 feet square, was filled to a depth of 4 feet, graded, manured and seeded.

Trinity avenue, from St. Mary's street to car tracks, was filled and graded, and adjacent ground terraced and sodded.

The northwestern section, at One Hundred and Forty-ninth street and St. Ann's avenue, was filled, graded, manured and sodded.

*Cedar Park—Area 17.47 Acres.*

Additional shrubs and plants were added to the planting of 1900 and 800 feet of new paths constructed.

*Macomb's Dam Bridge Park—Area 27 Acres.*

During the year there were 40,000 cubic yards of filling under privileges granted to various parks, all of which was without cost to the City.

All the sidewalks upon the streets and avenues have been relaid.

New gutters have been built, culverts and basins constructed and 800 feet of new paths made.

*University Park—Area 2.75 Acres.*

This park has been entirely constructed during the year under the provisions of a special act of the Legislature, situated facing the University grounds, at One Hundred and Eighty-first street and Sedgwick avenue. The land acquired was of a peculiar formation, being almost entirely the side of a hill that presented many difficulties in the method of treatment.

The work included the following items:

4,500 yards of earth excavation.

100 yards of rock excavation.

3,000 yards of embankment.

2,450 square yards of telford macadam pavement.

685 linear feet of vitrified drain pipe.

600 square yards of stone gutters.

7 road basins.

1,500 cubic yards top soil.

Grading, planting and seeding.

#### *Smaller Parks.*

The work on the small parks, Washington Bridge Park, St. James' Park, Fordham Park, Poe Park and the small intersections at the several avenues has been only the ordinary work of maintenance.

#### *Parkways.*

Bronx and Pelham Parkway—A great deal of work has been performed, the contract portion described in the report of the Chief Engineer. The parkway is nearly 12,000 feet long, with a width of 400 feet. The portion not under contract has been placed in thorough repair and the macadam pavement resurfaced wherever required.

Mosholu Parkway—In addition to keeping the parkway in good repair, a new road has been constructed in the northeast section for the benefit of the residents of Bedford Park, 400 feet long and 30 feet in width.

There were some 4,000 feet of gutters made.

The entrance to the parkway at Webster avenue for a length of 400 feet and 20 feet in width terraced and graded.

Retaining walls were built where required.

1,500 linear feet of fence was constructed.

#### *Spuyten Duyvil Parkway.*

A portion of the wall at the lower section of the parkway gave way in the spring and was rebuilt at an expense of \$2,800.

Trenches were dug and gutters constructed where necessary for drainage purposes.

#### *Crotona Parkway.*

No work has been performed on this parkway, for the reason that all the parkway has been torn up at the intersection of almost every street and avenue for the purposes of regulating, grading and sewerage.

It is proposed to take up the work upon the Crotona Parkway during the ensuing year.

## REPORT OF CHIEF ENGINEER.

NEW YORK, December 31, 1901.

*Hon. AUGUST MOEBUS, Commissioner of Parks:*

DEAR SIR—I herewith submit my annual report of the work performed during the year 1901 by the engineering force under my supervision.

Mr. John P. Schermerhorn, Assistant Engineer, is in charge of all survey and construction work in connection with the New York Zoological Gardens, in Bronx Park, the Bronx and Pelham Parkway and that section of Bronx Park under the control of this Department.

Mr. John Toomey, Assistant Engineer, is in charge of the topographical survey of Pelham Bay Park.

Mr. Lewis W. Spencer, Assistant Engineer, is in charge of the survey and construction work of the New York Botanical Garden, in Bronx Park.

Mr. Edward J. Farrelly, Assistant Engineer, has charge of the survey and construction work in all small parks, including the improvement of the small park opposite the New York University, the construction work of which was done by the laboring force of the Department. At present his corps is making a resurvey and location of the proposed road to connect Mosholu avenue, in Van Cortlandt Park, with Van Cortlandt avenue, in the City of Yonkers.

Mr. William P. Hennessy, Assistant Engineer, has charge of the draughting room, making all maps, and also acts as Supervising Architect of the construction of all buildings in the several parks.

The several contracts for work that have been finished during the year and those still under construction are hereinafter cited:

First—"Regulating, grading and paving the existing roads near the Botanical Museum in Bronx Park, in The City of New York."

John B. Devlin, contractor.

Contract executed January 10, 1900. Contractor ordered to begin work April 2, 1900. Final estimate forwarded February 8, 1901. The total cost of this contract amounted to \$21,268.30.

Second—"Grading, paving and improving existing roads from Bronx and Pelham Parkway to and around Nursery in Bronx Park, in The City of New York."

John B. Devlin & Co., contractors.

Contract executed July 10, 1900. Contractor ordered to begin work July 23, 1900. Total cost of this contract amounted to \$7,468.32.

Third—"Furnishing all the labor and materials for the erection and completion of a range of propagating houses in the Botanical Garden in Bronx Park, in The

City of New York, together with appurtenances and other work in connection therewith."

Hitchings & Co., contractors.

Contract executed August 20, 1900. Contractor ordered to begin work September 21, 1900. Final estimate forwarded January 25, 1901. Total cost of this contract amounted to \$16,174.50.

Fourth—"Furnishing all labor and materials for constructing a public comfort building in the New York Zoological Park in Bronx Park, in The City of New York."

N. W. Ryan, contractor.

Contract executed August 27, 1900. Contractor ordered to begin work September 21, 1900. Final estimate forwarded April 26, 1901. Total cost of this contract amounted to \$17,200.

Fifth—"Furnishing all labor and materials for constructing a greenhouse in the New York Zoological Park, in Bronx Park, in The City of New York.

Hitchings & Co., contractors.

Contract executed October 16, 1900. Contractors ordered to begin work October 30, 1900. Final estimate forwarded January 19, 1901. Total cost of this contract amounted to \$3,449.

Sixth—"Grading, paving and improving existing roads from Lorillard mansion gate to Bleecker street and to and across the Blue Bridge connecting with improved roadway near the Botanical Museum, in Bronx Park, in The City of New York."

The John J. Hart Company, contractors.

Contract executed November 12, 1900. Contractors ordered to begin work December 3, 1900. Final estimate forwarded June 5, 1901. Total cost of this contract amounted to \$13,159.39.

Seventh—"Furnishing all labor and materials for constructing a skate and golf house at Van Cortlandt Lake, in Van Cortlandt Park, in The City of New York."

William Henderson, contractor.

Contract executed November 24, 1900. Contractor ordered to begin work December 3, 1900. Final estimate forwarded June 14, 1901. Total cost of this contract amounted to \$18,400.

Eighth—"Constructing a bridge over the New York, New Haven and Hartford Railroad—Harlem River branch—at the crossing of the Bronx and Pelham parkway."

John G. Tait, contractor.

Contract executed November 26, 1900. Contractor ordered to begin work January 21, 1901.

The work on this bridge has proceeded to the point of completion of the abutments and the contractor is now awaiting the iron superstructure.

The amount paid on this contract, to and including Estimate No. 4, is \$22,418.60.

Ninth—"Constructing and improving a portion of the Bronx and Pelham parkway from the westerly terminus of the improved portion of said parkway—400 feet westerly of the Bear Swamp road—to a point 1,275 feet westerly of said terminus, in Bronx Park, in The City of New York."

William H. Masterson, contractor.

Contract executed January 16, 1901. Contractor ordered to begin work February 18, 1901. This work is nearing completion. The amount paid on this contract to and including Estimate No. 7, is \$45,794.50.

Tenth—"Furnishing all labor and materials for constructing complete a workshop and sheds in the New York Zoological Garden, in Bronx Park, in The City of New York."

Wilbur T. Wright, contractor.

Contract executed January 19, 1901. Contractor ordered to begin work February 4, 1901. Final estimate forwarded August 23, 1901. Total cost of this contract amounted to \$12,900.

Eleventh—"Grading grounds, constructing, regulating, grading and paving walks and roads, furnishing and laying iron water pipe, setting hydrants, etc., in the Botanical Garden, in Bronx Park, in The City of New York."

John H. Devlin, contractor.

Contract executed January 23, 1901. Contractor ordered to begin work March 4, 1901.

This work, owing to the winter weather, is now moving along very slowly. The amount paid on this contract, to and including Estimate No. 9, is \$62,902.35.

Twelfth—"Furnishing all the labor and materials for the erection and completion of a house for primates in the New York Zoological Garden, in Bronx Park, in The City of New York."

Thomas Cockerill & Son, contractors.

Contract executed January 31, 1901. Contractors ordered to begin work March 12, 1901. The building is nearing completion. The only delay has been in the delivery of the terracotta.

The amount paid on this contract, to and including Estimate No. 6, is \$56,672.



Thirteenth—"Furnishing and delivering hardware, etc., in Claremont Park, in the Borough of The Bronx."

The Manhattan Supply Company, contractors.

Contract executed February 23, 1901. Contractors ordered to begin the delivery of goods March 18, 1901. Final estimate forwarded April 10, 1901.

Total cost of this contract amounted to \$774.14.

Fourteenth—"Furnishing and delivering lawn mowers for the Department of Parks, Borough of The Bronx."

The Coldwell Lawn Mower Company, contractors.

Contract executed February 26, 1901. Contractors ordered to begin delivery of goods and to execute the other terms of the contract March 18, 1901.

Owing to a clause in the contract requiring the contractors to keep mowers in repair for one year no estimate has been forwarded.

Fifteenth—"Furnishing and delivering paints, oils, etc., in Claremont Park, in The City of New York."

C. A. Harper, contractor.

Contract executed March 6, 1901. Total cost of this contract amounted to \$739.97.

Sixteenth—"Furnishing all labor and all materials for constructing three music stands in parks in the Borough of The Bronx, in The City of New York."

Jacob E. Butterworth, contractor.

Contract executed March 18, 1901. Contractor ordered to begin work April 1, 1901. Final estimate forwarded July 12, 1901.

Total cost of this contract amounts to \$2,682.

Seventeenth—"Grading grounds, constructing, regulating, grading and paving walks, constructing retaining walls, erecting iron railing, etc., in small parks between Fulton and Franklin avenues and One Hundred and Sixty-seventh street, in The City of New York."

Charles L. Doran, contractor.

Contract executed April 9, 1901. Contractor ordered to begin work April 29, 1901. Final estimate forwarded December 13, 1901.

Total cost of this contract amounted to \$4,662.85.

Eighteenth—"Furnishing all labor and all materials for erecting iron pipe railing on portions of retaining walls along the Spuyten Duyvil parkway, in the Twenty-fourth Ward, in The City of New York."

The J. W. Fiske Iron Works, contractors.

Contract executed April 10, 1901. Contractor ordered to begin work April 29, 1901. Final estimate forwarded December 13, 1901.

Total cost of this contract amounted to \$1,681.96.

Nineteenth—"Grading grounds, constructing, regulating, grading and paving walks and roads, furnishing and laying iron water pipes, constructing basin for statuary fountain, erecting garden fountain and drinking fountain, constructing stone seats, etc., in front of the Museum building, and cornice and roof ornaments on Botanical Museum, in the Botanical Garden, in Bronx Park, in The City of New York."

The Wilson & Baillie Manufacturing Company, contractors.

Contract executed April 15, 1901. Contractors ordered to begin work May 1, 1901. This work is still in progress, and will be more or less delayed throughout the winter on account of freezing weather.

The amount paid on this contract, to and including Estimate No. 6, is \$33,575.40.

Twentieth—"Furnishing and delivering broken stone, coarse screenings and fine screenings, where required, in the parks in the Borough of The Bronx."

James J. Marks, contractor.

Contract executed April 29, 1901. Contractor ordered to begin delivery May 9, 1901. Final estimate forwarded December 18, 1901. Total cost of this contract amounted to \$4,808.30.

Twenty-first—"Furnishing all the labor and all the materials necessary to erect and complete the range of horticultural buildings in the Botanical Garden in Bronx Park, in The City of New York."

John R. Sheehan & Co., contractors.

Contract executed April 30, 1901. Contractors ordered to begin work May 20, 1901.

This work is nearing completion, and the amount estimated on this contract, to and including Estimate No. 5, is \$66,276.50.

The Lord & Burnham Co. are the architects of this work, and the amount of \$2,867.33 has been paid for professional services.

Twenty-second—"Regulating and grading portions of the Bronx and Pelham parkway, in The City of New York."

John B. McDonald, contractor.

Contract executed May 8, 1901. Contractor ordered to begin work June 1, 1901. The work is still in progress and the amount estimated, to and including Estimate No. 3, is \$51,613.

Twenty-third—"Rebuilding portions of the retaining walls on Spuyten Duyvil parkway, in The City of New York."

The John J. Hart Company, contractors.

Contract executed June 19, 1901. Contractor ordered to begin work July 1, 1901. Final estimate forwarded September 11, 1901.

Total cost of this contract amounted to \$2,800.

Twenty-fourth—"Furnishing materials and laying water pipes, vitrified pipe sewers and constructing manholes, etc., in the Zoological Garden, in Bronx Park, in The City of New York."

Stone & Thurston, contractors.

Contract executed June 27, 1901. Contractor ordered to begin work July 15, 1901. Final estimate forwarded December 27, 1901.

Total cost of this contract amounted to \$10,191.27.

Twenty-fifth—"Constructing a motor road and excavating for tree plantations in the Zoological Garden, in Bronx Park, in The City of New York."

John H. Devlin, contractor.

Contract executed July 9, 1901. Contractor ordered to begin work July 29, 1901. Final estimate forwarded December 30, 1901.

Total cost of this contract amounted to \$8,534.06.

Twenty-sixth—"Furnishing all the labor and materials for the erection and completion of a lion house in the New York Zoological Garden, in Bronx Park, in The City of New York."

Thomas Cockerill & Son, contractors.

Contract executed July 24, 1901. Contractor ordered to begin work August 19, 1901.

This work has proceeded very satisfactorily, but the contractors have been ordered to cease work on account of freezing weather.

The amount estimated on this contract, to and including Estimate No. 4, is \$45,010.

Twenty-seventh—"Constructing a concrete dam and appurtenances across the Bronx river in the Zoological Garden, in Bronx Park, in The City of New York."

John C. Rodgers, Jr., contractor.

Contract executed July 30, 1901. Contractor ordered to begin work August 19, 1901. Final estimate forwarded December 30, 1901.

Total cost of this contract amounted to \$6,832.42.

The plans for the proposed bridge over Eastchester Bay, in Pelham Bay Park, have been forwarded, with an estimate of the cost, for your consideration.

Three per cent. payments on amount retained as security for repairs were made and forwarded, as follows:

May 18, 1901—Payment No. 2, for "Improving small park on the westerly side of Fulton avenue, between One Hundred and Sixty-ninth and One Hundred and Seventieth streets, in the Borough of The Bronx of The City of New York."

William J. Moore, contractor.

Amount paid, \$11.64.

August 2, 1901—Payment No. 2, for "Furnishing all the materials and labor for erecting complete the approach to the public building, also grading and improving the grounds surrounding, in Crotona Park, at Third and Tremont avenues, in The City of New York."

Thomas Kelly, contractor.

Amount paid, \$94.31.

August 2, 1901—Payment No. 2, for "Constructing and improving a portion of St. Mary's Park, in the Twenty-third Ward of The City of New York."

Edward A. McQuade, contractor.

John McQuade, assignee.

Amount paid, \$35.80.

December 2, 1901—Payment No. 2, for "Constructing and improving of a portion of Claremont Park, in the Borough of The Bronx, in The City of New York."

John B. Devlin, contractor.

Amount paid, \$115.91.

All the engineering and construction work under my supervision is progressing in a satisfactory manner, with the exceptions hereinbefore mentioned.

The gross amount estimated to be paid on the foregoing contracts for which final and progress estimates have been forwarded to the Chief Clerk's office during the year covered by this report is \$541,119.02.

Respectfully yours,

(Signed) MARTIN SCHENCK, Chief Engineer.

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REPORT OF THE SECRETARY AND DIRECTOR-IN-CHIEF OF THE NEW YORK BOTANICAL GARDENS FOR THE YEAR 1901.

I have the honor to submit herewith my report as Secretary and Director-in-Chief for the year ending January 13, 1902.

The year has been one of great activity in construction, installation of exhibits, exploration, investigation and teaching. The number of visitors has been largely in

excess of that in any previous year, and the public interest in and acquaintance with the institution is steadily increasing.

### *Plants and Planting.*

1. *Herbaceous Grounds.*—Considerable rearrangement has been made of the herbaceous collections by moving some of the groups from their previous positions to others nearby where the cultural conditions have proven by experience to be more favorable. This has been accomplished, however, without taking them out of the general botanical sequence. The addition of many species not hitherto represented and the growth of others already installed have necessitated taking considerably more ground under high cultivation. The total number of species grown in this collection during the year is about 3,020. Maintenance and installation have required the time of one gardener and two laborers during the cultural season. The excavation for the small lake planned for water plants at the southern end of the herbaceous grounds was partly made during the fall and early winter, and may be completed in the spring.

2. *Fruticetum.*—Little change has been effected in the collection of shrubs other than by the planting of additional species derived from various sources. This collection has now reached a condition, however, which makes it desirable to transplant, for cultural reasons, a considerable portion of it, and to thus bring the groups into areas more nearly in agreement with the plan to which we are working than has been possible while the collection has been in a formative state. It is intended to effect this rearrangement in the spring. The number of species represented is 512. This collection has required the attention of one gardener and one laborer for about one-third of their time, but after its rearrangement will probably demand their full time during the cultural season.

3. *Salicetum.*—The willow collection, established in the meadows and marshes near the northern end of the grounds, has required little actual cultural attention. It has been somewhat increased by additional species drawn from the nurseries, the number now represented being 43.

4. *Arboretum.*—The tree collections already planted have been cared for but not materially increased during the year. A considerable number of specimens of deciduous trees have been moved into place east of the Bronx river from the nurseries, but it has not been practicable as yet to extend the planting of conifers, this having to await the completion of grading operations in the vicinity of the conservatories, and it is unlikely that much of this planting can be done before the spring of 1903. In this connection I take pleasure in referring to the generous offer of Mr. Lowell M. Palmer, of Stamford, Conn., to present the garden, from his very extensive collection of hardy conifers, with specimens of a large number of species and varieties at such times as we are ready to receive them. Mr. Palmer's offer also includes specimens of many hardy ferns, of which he has a noteworthy collection. The total number of kinds of hardy trees represented in the garden, including those native to the tract, is over 290. The care of

the planted specimens has required the work of one gardener and one laborer for about one-third of their time.

5. Viticetum.—The vines and trailers brought together on the rough arbor east of the museum building have been cultivated and trained, and many of them are now of considerable length. The number of species represented is 62. Their care has required the attention of a gardener for a few hours a week.

6. Nurseries.—The plan relative to the nursery work referred to in my report for the preceding year was carried out in the spring, the first nursery planted being abandoned and its contents transferred to other plantations. The work was then concentrated on about two acres of land immediately south of the propagating houses on the east side of the grounds, part of this area being devoted to herbaceous plants, part to deciduous trees and shrubs, part to conifers. The cold frames were set immediately in front of the propagating houses. The work of propagation and experimentation both out of doors and under glass is thus all brought together and is conducted by the same men. One foreman gardener, one apprentice and one laborer have been required, with a few days' occasional additional help from a fourth man. The propagating houses are thus operated as a part of the nurseries. In addition to the care of several thousand young plants, cuttings and bulbs brought into the nurseries from various sources, over 6,000 packets of seeds were sown. These were obtained by exchange from other botanical gardens, by gift and collected by our several exploring parties. From this source we now have about 10,000 young plants for distribution during the next year among various permanent plantations or for exchange with other institutions. The number of species in the nurseries not represented in other collections is about 1,000.

7. The Public Conservatory Collections.—The number of species growing in the great greenhouses has increased during the year through gifts, exchanges and the work of our expeditions from about 1,800 to 3,400. The collection naturally continuously occupies more space by growth, so that for these reasons the houses have now become fairly well filled, crowded, indeed, in some places. The additional houses now nearing completion are thus very welcome. The arrangement of the groups mentioned in my last annual report has been changed only in details. Many duplicates have been sent to other institutions and many still remain available for exchanges. Some specimens received in bad order have been rejected, but on the whole our gardeners have succeeded wonderfully well in bringing such a necessarily heterogeneous collection into good condition. The operation of the new houses will now necessitate and permit an entire rearrangement of these collections. A detailed plan for this has been elaborated, taking into account the practically doubled variety of temperature and humidity conditions which the range will afford and which will enable better cultural results to be reached than has hitherto been possible for lack of such varied conditions. The care of the conservatory collections has been accomplished by a foreman gardener, seven gardeners and two apprentices. This force must ultimately be doubled.

The primary stocking of the conservatories was greatly aided by a special fund subscribed for this purpose in 1900 and 1901, as follows:

D. O. Mills .....	\$250 00
Samuel Henshaw .....	25 00
Charles F. Cox.....	50 00
N. L. Britton .....	100 00
J. Pierpont Morgan.....	100 00
Andrew Carnegie .....	250 00
Very Rev. E. A. Hoffman .....	50 00
S. P. Avery .....	50 00
John I. Kane .....	50 00
William E. Dodge.....	250 00
Theo. F. Jackson.....	25 00
A Manager .....	100 00
A. G. Mills .....	10 00
Mrs. Esther Herrman .....	25 00
Banyer Clarkson .....	25 00
James B. Ford .....	200 00
H. C. von Post.....	100 00
Francis Lynde Stetson.....	25 00
James J. Goodwin .....	25 00
Samuel Thorne .....	50 00
Edgar L. Marston .....	25 00
Samuel P. Avery, Jr.....	5 00
Samuel N. Hoyt .....	25 00
E. R. Holden .....	25 00
Isaac J. Greenwood.....	25 00
Anna R. Spring.....	10 00
Isaac N. Seligman .....	50 00
C. A. Coffin .....	50 00
Mrs. Edwin Parsons .....	10 00
W. S. Gurnee .....	50 00
Anonymous .....	10 00
Adolph G. Hupfel .....	25 00
George Gill .....	10 00
Charles Pryer .....	10 00
Elizabeth Billings .....	15 00
John H. Bloodgood .....	20 00
	<hr/>
	<b>\$2,135 00</b>

This fund was mainly expended in paying transportation charges on plants secured by exchange with other institutions or donated by friends of the garden, and in defraying the expenses of Mr. George V. Nash, Head Gardener, during a visit to the Royal Gardens at Kew, England, in the early spring.

The stocking of the additional conservatories, now essentially completed, must be taken up as the most important work of the year as regards the collections, and one which will require the expenditure of a considerable amount of money.

8. Boundary Borders.—The boundary borders have been cultivated throughout such parts as have been desirable and variously modified by addition and substitution of plants. Most attention has been given to the western border, extending along the New York Central and Hudson River Railroad from St. John's College to the north meadows, inasmuch as this boundary is permanently well defined by the railroad right of way. The mixed "old-fashioned" flower garden, extending along the front of this border screen from the Southern Boulevard Bridge north to the lakes, has been maintained without much alteration, but it is planned to rearrange it somewhat in the spring. No work has been practicable along the St. John's College border owing to road building operations. The north border has been strengthened in places, but not much cultivated, and no work has been done on the east border except in the vicinity of the stable. These planted borders now screen the grounds quite effectually from without along considerable portions of their extent. Their care has needed the work of one gardener and two laborers for about one-half their time.

9. Other Plantations.—The groups of shrubs planted last year in the vicinity of the railroad station have been cultivated; an additional group was set out in the autumn on the right hand side of the path from the station to the museum building, and the triangle formed by the intersection of the driveways south of the museum building was partly planted. Each of these groups has been formed of shrubs of the same natural family. A number of young trees were set out in the vicinity of the station in the spring; all this planting is in accordance with our general plan.

The total number of species now represented in the plantations, conservatories and including the native flora of the tract, is about 9,300, an increase during the year of about 4,000.

The general direction of planting and of the care and recording of the plants has been carried out by Mr. George V. Nash, Head Gardener, and Mr. George A. Skene, Second Gardener, Mr. Nash taking personal charge of the administrative work, of the installation and the labeling, Mr. Skene superintending the cultural work and the care of the grounds, plantations, trees and forest. Labeling and recording has required the constant attention of two apprentices. Further details relative to plants and planting will be found in the report of the Head Gardener, hereto appended.



*Buildings.*

I. Museum.—No changes have been found necessary in this building other than minor details of construction made desirable by the growth of the collections, and a few ordinary repairs. The installation during the summer in the east basement museum hall of the paleobotanical collections deposited with the Garden by Columbia College, under the supplementary agreement between the Garden and the Trustees of the College, dated May 3, 1901, **made it desirable to construct two small rooms at the east end of the hall for storage and sorting of the fossil plants.** These were built during the autumn by means of brick partitions about one-half of the height of the hall. Cases partly sufficient for the display of this collection came with it from the college; these were set up and specimens arranged in them during the autumn; the miscellaneous specimens previously stored in this hall were removed to the basement room under the southern end of the east wing, and the paleobotanical collection was opened to the public early in December; it requires three additional table cases and eight additional wall cases to complete the furniture equipment of the hall. The new storage rooms are being filled up with cases of trays built by our own carpenters.

In the west basement hall, used during the spring for horticultural exhibitions in co-operation with the Horticultural Society of New York, were placed four wooden tables, extending nearly the whole length of the hall; these are available for future use for the same purpose. The engineers of the Park Department engaged in construction work on the grounds and buildings, previously accommodated in one of the east basement rooms, have recently been given temporary quarters by placing a movable partition in the western end of this west basement hall.

All the work of preparation, mounting and arranging museum and herbarium specimens, other than fossil plants, has now been brought into basement rooms at the east end of the building; the stock of back numbers of publications, now become quite bulky, but of great value for exchanges, **has been stacked and arranged in another of the east basement rooms.**

No new construction work has been done in the museums on either the first or second floor; both floors urgently require additional cases for the display of the constantly increasing collections, and it is hoped that these may be forthcoming during the year, through the additional appropriation for construction, asked by the Commissioner of Parks from the Board of Estimate and Apportionment on November 25, 1901.

The silk shades placed in the upper parts of the windows of the second floor under the original contract for the construction of the building, have proven to be of poor material; they have faded and many of them have decayed. They are now being replaced by stout cambric shades.

Additional construction work on the third floor includes the building of a wall-case for the valuable collection of old microscopes presented by Mr. C. F. Cox, and of an-

other for the collection of photographic negatives; these were made by our own carpenters, placed in the laboratories and their contents arranged for ready reference. Twelve table desks for the laboratories built specially for the purpose, after a design by Dr. MacDougal, were added to the equipment in May. The ordering of these was alluded to in my last annual report, as well as of additional shelves for the bookcases in the library stack room, which were supplied in May. The desirability of shelving the walls of the library reading room, also there referred to, became a need in the autumn, and on October 23 the Board of Managers approved a design for this shelving, and authorized its construction; it was at once ordered, but has not yet been put into place. In order to permit the arrangement and ready access to duplicate books, the closet at the western corner of the library stack room was shelved by our carpenters to the ceiling, and the closet at the western corner of this room was fitted up with movable sets of shelves previously in use elsewhere. The herbarium of the Torrey Botanical Club, presented by the club to the Garden in June, was arranged in old cases previously in use in the storerooms, and placed against the wall in the hallway connecting the herbarium room with the taxonomic laboratory. A case of herbarium specimens under study was built at the eastern corner of the herbarium room, and another for the same purpose in the small storeroom next the herbarium room.

The cases containing the main herbarium are now so nearly filled that the collection is being used under difficulties and with danger to the specimens themselves in handling. At least twenty additional cases are needed to accommodate the collection and its natural increase during the next two years; in case of delay in obtaining an additional city appropriation for construction, I propose to have eight such cases built by our carpenters during the winter.

The museum building has been open to the public every day in the year from 10 o'clock until 4.30 or 5; it has been found practicable to reduce the number of janitors from five to four men, who have taken the entire care of it, including cleaning of floors, windows and cases. Public access to the building is still necessarily restricted to one of the basement doors, pending the completion of the front approach, the contract for which has been vexatiously delayed to beyond the limits of satisfactory explanation. The main entrance cannot, for this reason, be used until spring.

The additional ornamental terra cotta work for the pavilions of the museum building, included in the contract referred to, has likewise been delayed, and while recently delivered, cannot be put in position during the winter.

Front Approaches to the Museum Building.—Under a contract awarded early in the year by the Commissioner of Parks to the Wilson & Baillie Manufacturing Company, work was begun in the spring, and was continued until stopped by cold weather in December. Reference to the part of this contract covering grading and road-building is made elsewhere in this report. The contract includes, in addition, provisions for the construction of a drinking fountain and marble seats on the south side of the drive-

way; a garden fountain, with similar marble seats on the north side of the driveway, and the foundations, basins and copings for the statuary fountain immediately in front of the museum building; also the setting of the additional ornamental terra cotta on the pavilions of the building itself. All this work is in accordance with plans drawn by the architect, Mr. Gibson, and duly approved by you and by the Commissioner of Parks. It has been exasperatingly delayed, and the contractors have long ago exhausted their time-limit under the contract; the foundations of all three fountains have been built and much of the marble has been set, but it will require at least a month's work in the spring to complete the contract, especially as some of the stone setting has been found to be faulty and will have to be rebuilt; the terra cotta has been delivered, but none of it put into place.

Under instructions from a sub-committee of the Executive Committee, Mr. H. A. MacNeil, sculptor, was invited in May to submit a model for the statuary fountain, the model previously submitted by Mr. Kemensky not having proved satisfactory. Mr. MacNeil has not yet sent his model in, but he has informed us that it is now essentially ready for examination.

2. The Public Conservatories.—These buildings have stood the test of a year's operation satisfactorily. They have been open to the public every day from 10 o'clock until 4.30 or 5; breakage of glass from expansion or contraction has gone on to a slight extent only, and has proved not nearly as great a charge for maintenance as it was supposed it would be. An unprotected blast of rock, just east of the eastern end, fired in August by a foreman in the employ of the contractor engaged in grading, caused breakage which cost the contractor over \$150 to repair; this is the only accident worth recording. The houses have been repainted throughout on the outside, and nearly throughout on the inside. A few minor defects in the roofs, causing leakage in heavy storms, have been mainly remedied, and I have recently accepted an unsolicited offer by Hitchings & Co., the builders of the roofs, to modify, at their own expense, the construction at the ridges of the lower houses, looking toward a complete correction of this defect, which has, however, not been of a serious character. The heating of these buildings has been easily accomplished by the radiating coils first installed, these having proven ample for the purpose in the coldest weather; from the exposed position of the houses this has, however, only been accomplished by the burning of a very large amount of coal. The trouble from gases emanating from the trenches alluded to in my last annual report has not again been experienced; it was apparently referable to volatile matter contained in the insulating covering of the steam mains.

After a series of observations with hygrometers and thermometers in all the houses, taken at intervals of two hours, from September, 1900, to May, 1901, in order to ascertain the desirable and practicable relations of temperature and humidity to establish for the different parts of the system in relation to the plant collections and to external light, a method of shading by a combination of stippling the inner surface of the glass, and

by movable shades, was adopted. It was necessary to devise this so as to make it practicable to extend it, without loss of work, to the additional houses, the construction of which was commenced at that time. The roofs and vertical sides of some of the houses were stippled, using a mixture of linseed oil and white lead, determined for density after experiment; water-proof shades on spring rollers were placed in the roofs of two houses, and Japanese porch screens were used for the vertical sides of the palm house and for the roofs of the succulent house. All this shading was done on the interior, leaving the outside of the building unmarred.

The results reached were very nearly those planned for, and hence satisfactory; the year's experience has naturally indicated some desirable modifications of details, which may be taken advantage of in the additional houses, as well as in those hitherto operated.

A contract for the construction of the additional houses to complete the range as originally planned was awarded by the Commissioner of Parks to John R. Sheehan & Company in May, and work was at once begun. These are now essentially completed and are under test for heating and leakage. Their internal fitting up with gravel and soil, and the spreading into them of the plant collections, may soon be commenced, and they may be opened to the public in the spring.

The defect in the floor of house No. 4, mentioned in my last annual report, caused by sinking of filled ground, was repaired by the Sheehan Company while building the walks in the new houses. Two painters and glaziers have been employed on the conservatories for nearly their whole time; it has been found possible, however, for them to do such painting and kalsomining as has been necessary at the other buildings.

3. Power House.—The steam heating apparatus has been adequate to heat both the public conservatories and the museum building, as planned, holding at least one boiler of the five always in reserve. During the summer an inspection was made of the entire system of pipes, in the subways and trenches; it was found necessary to rebuild some of the brickwork about the furnaces. The boilers have been regularly inspected. The incidental repairs required have been numerous but not excessive. The grading and road-building work east of the power house have given considerable trouble from storm water which in two instances flooded the floor of the building; this trouble cannot wholly be eliminated until the road-banks are sodded and the drainage properly disposed of, by connecting the system of land drains with the main city sewer in Webster avenue, a work which is now in progress.

4. Propagating Houses.—These small greenhouses were accepted by the Commissioner of Parks, from Hitchings & Co., the contractors, in January, and were at once turned over to us for operation. They have proved to be well built, easily heated and satisfactory for their purposes. The roof of the potting shed developed some leaks which have been repaired. Not having water under pressure at their location when they were finished a large brick tank was built between the two long houses as a roof-

water reservoir, and this had to be depended upon until the waterpipe was laid to these houses during the spring. The plan for the propagating houses contemplates the building of a third long house in the future, but the need for it is not yet urgent.

5. Stable.—No work has been done on this building except painting, reflooring stalls and minor repairs.

6. Public Comfort Station.—This building was connected with the sewer and the water supply was brought to it during the summer, but, as other more important work prevented the building of paths to it, it has not been opened to the public, though useful for storage purposes.

7. Tool House.—No changes have been made at this building.

#### *Drainage and Sewerage.*

In connection with the building of roads and paths about the public conservatories and of the front approaches to the museum building, the Department of Parks has laid earthenware drain pipes of large sizes and constructed the necessary surface basins, substantially as contemplated in our plans. In the progress of path building by our laborers, several additional surface basins have been constructed, and connected with the main drainage system, also according to plan.

The ultimate disposal of the drainage of the public conservatories and their surroundings west to the New York Central and Hudson River Railroad, presented a difficult problem, and one which was not wholly solved in the general plan. It was finally determined to solve it in the most effective and permanent manner practicable, although entailing great expense, and thus necessarily delaying other work. At the time the tracks of the railroad were depressed and grade crossings eliminated, the present bridge at the crossing of the Southern Boulevard was built and at the same time a brick sewer was laid under the railroad in the center of the Boulevard, but this had never been connected with the main City sewer in Webster avenue to the west. I endeavored, with the assistance of the Commissioner of Parks, early in the year, to induce the Department of Sewers to build this connection, in order that we might then connect with it on the eastern side of the railroad. This Department expressed entire willingness to do the work, and we hoped it might be arranged for, but it became apparent late in the autumn that funds were not available. Meanwhile the power house was endangered by storm water, banks were being washed and the railroad right of way occasionally flooded. We then determined to use some funds, available in a City appropriation for construction and in improving the grounds, and other money from your appropriation for grading, drainage and water supply, and do the work ourselves; it is still in progress. The essential difficulty is the necessity of making an open cut averaging twenty-three feet deep in filled ground full of boulders, but we have progressed up to the present time without incidents demanding record. This sewer connection, when once established, will take care of all the drainage and sewerage of the garden not already pro-

vided for or satisfactorily planned. A deep excavation for about fifty feet will be necessary at the eastern end of the Boulevard bridge, but the rest of the work will be simple. It is doubtless the most important piece of construction work now under way.

The plan for supplying the two lakes northeast of the museum building with rain water from the drainage system running south to the curve in the Southern Boulevard has worked out satisfactorily, the watershed being sufficient to raise the lake surface about three inches for each inch of rain-fall. This will be somewhat increased when all the grading is done and the surface basins all built. During long periods of drought it may be necessary to supplement this supply from the water mains, but not much additional water will be required at any time.

The dam in the Bronx river at the Lorillard mansion will ultimately have to be lowered as indicated by the original studies, in order to drain the northern end of the reservation in a satisfactory way; observation and experience during four seasons clearly show this to be necessary.

During the building of the driveways east of the Bronx river in the spring, the land drains previously laid about the stable and to the old stable and to the old nursery site were connected with a large earthenware pipe, which was laid northwest from near the stable to a point along the road north of the tool house, temporarily discharging on the surface at the head of a small valley; this line will ultimately be continued to the Bronx river. At the same time a sewer pipe connection was made with the stable and the pipe laid northwest to a point which renders unnecessary the tearing up of the driveway in its continuation to the main sewer already built; this continuation may be built when convenient

The roof water of the propagating houses is connected into a pipe which, for the time being, discharges on the surface at the east border of the park near the houses.

#### *Water Supply.*

Under the City contracts for construction the system of water pipes has been much extended, in accordance with the general plans; a six-inch line has been laid alongside the park driveway built around the conservatories and connected at both ends with pipes of the same size previously laid; this has been supplied with hose-taps every two hundred feet. Another six-inch line has been laid from a point on the Southern Boulevard east of the power house along the driveways to the fountains on the driveway in front of the museum building and also supplied with hose-taps. A two-inch line was run from this to connect with pipes already laid to the railing station and the plantations about it. The large statuary fountain, now under construction, will be connected by a three-inch pipe with the six-inch line which supplies the museum; part of this has been laid.

Partly by means of City appropriation for construction and partly from our appropriation for grading, drainage and water supply, a six-inch line was laid from a point

just south of the museum building along the driveway to the west lake; from here a two-inch line was run off across the park to the east along the driveways and under the Bronx river to the stable, nurseries and propagating houses, and another to the west along the lake to the public comfort station.

The City Department of Water Supply, under permission granted them by you November 2, 1898, began in the spring the laying of a four-foot main through the grounds from a point on the western boundary northwest of the museum building, southerly in front of that building to the Southern Boulevard and thence on that road beyond the garden reservation; this line is a part of one of the primary distributing systems from the new Jerome Park reservoir, and is designed to supply a large part of the eastern and central portions of the Borough of The Bronx. It runs through the garden alongside of the old three-foot pipe from the Williamsbridge reservoir. The work within the garden was completed in November, with the exception of a few feet near the western boundary, where this main has to pass under the right of way of the New York Central and Hudson River Railroad: it appears to be unlikely that this will be finished until spring. A one-foot connection directly in front of the museum building has been left for the use of the garden, when desired, in accordance with the terms of the permission given the Department. This connection with the new line, and the eight-inch connection we already have on the old one, insure the park an abundant water supply. Water will probably not be turned into the new main for two years or more.

#### *Grading.*

Grading operations outside the lines of road and building contracts have been continued by means of our teams and laborers throughout the year, as opportunity has been afforded, the new surfaces being made with top soil ranging from one to four feet in thickness, obtained by stripping it from path and road lines, and from stacks previously made from the same sources.

The east side of the driveway built last year from the Southern Boulevard to the lakes was graded and sown or sodded; likewise the west side of this driveway from the museum to the lakes, and the sides of the paths parallel to this same driveway from the museums to the western lake, and from the museum for 800 feet toward the herbageous grounds.

The slope between the east end of the museum building and this driveway, on which some work was done last year, has been completed and sown; a great deal of rock was encountered here, which was excavated to an average depth of four feet beneath the finished surface. Considerable work has been done in grading at the rear of the museum building, contingent upon the construction of the service road to the rear of that building, and the finished surfaces sown.

A large amount of filling, principally with top soil, has been done along the western side of the western of the two driveways to the front of the museum building; but the

completion of this work has necessarily been deferred until spring, awaiting the finish of these front approaches. Some top soil has been hauled from path stripping about the herbaceous grounds to the area south of the museum building and between it and the driveway, and stacked there ready for spreading.

The sides of the path, built along the western border of the herbaceous grounds have been graded and sodded or sown.

The total area regulated and graded and sodden or sown is over one acre.

The sides of the driveway built east of the Bronx river through the arboretum were graded sufficiently to make them safe, but no attempt was made to bring them to a final finish.

Under the Park Department contract with John B. Devlin, awarded January 3, 1901, referred to in my last annual report, for the grading and building of roads and paths about the public conservatories, much work has been accomplished, including the rough completion of the terrace about those buildings, except at its eastern end and a portion of the northern. The approximately complete shaping of the grounds along the driveway and traffic road south and west of the conservatories and its partial completion to the east and north of them, including partial reconstruction of the line of the Southern Boulevard. This work is still going forward. The provisions of this contract should be satisfied by June or July. Under a contract awarded in the spring by the Commissioner of Parks to the Wilson & Baillie Manufacturing Company for the construction of the front approaches to the Museum building, the unsightly hill south of that building has been removed and part of the area brought to approximately finished grade. Some rock excavation still remains to be done there in places, and the top soil stacked there in reserve must be spread. A very large rock surplus was obtained from the hill thus removed. Some of it was used at once in the telford foundations of roads and paths and the rest stacked in the field in front of the Museum building and about the lakes, in order to have it convenient for future road and path-building operations. It is being gradually used for these purposes and is of great value, although temporarily unsightly.

#### *Roads and Paths.*

The Park Department contract with John B. Devlin, awarded in November, 1899, referred to in my last annual report, for the building of driveways about the Museum building, was completed in the spring. The greater portion of this work has stood very well, notwithstanding the heavy wear to which it has necessarily been subjected by the subsequent cartage over it of building materials and soil. From this cause, and also on account of part of it having been surfaced and rolled in cold weather during the winter of 1900-1901, certain portions will need partial resurfacing. The contractor has agreed to do this at his own expense.



The Park Department contract with the John J. Hart Company, awarded in September, 1900, for building driveways from the lakes eastward across the park to the Bleecker street entrance and to the Lorillard mansion, and referred to in my last annual report, was also completed in the spring. The work has stood wear satisfactorily.

The Park Department contract with John B. Devlin, awarded December 11, 1900, which includes the building of driveways and paths about the conservatories, has been continuously prosecuted during the year, and, as mentioned under the heading of grading, is not yet completed. Under this contract the surface road, extending from the power house south and east along the St. John's College property, has been built essentially complete, but it has not yet been opened for public use, awaiting a final surfacing and rolling and some grading along its sides in the spring. The park driveway running parallel with this traffic road has also been nearly completed, needing yet to be connected at both ends with driveways previously constructed and to be properly finally surfaced in warmer weather. Part of the paths have been built and the sub-grade for other parts made, but most of the path work still remains to be done during the spring. Under the contract with the Wilson & Baillie Co., before referred to, the two driveway approaches to the front of the Museum building have been nearly completed.

By means of our own teams and laborers, supplemented by a force kindly furnished by the Commissioner of Parks, the foundations of paths have been laid with surplus rock from the excavations for a total length of about 4,500 feet. This includes the line from the Museum building to the western lake, a stretch at the eastern end of the east lake and from one near the Museum building south to and nearly completely around the herbaceous grounds, all in accordance with the general plan. In the same way the telford foundation has been laid up for the driveway extending north and east of the herbaceous grounds and thence south through the woods, skirting the western side of the hemlock grove, to the southern edge of the garden reservation, for about half its length (786 feet, 25 feet wide). Stone for the continuation of this road is being hauled this winter from the surplus stacked in front of the Museum building. It has been planned by the Park Department to continue this road from our southern boundary through the park land which separates the garden from the Zoological Park, overlooking the Bronx river in places, to Pelham avenue, ending it on the avenue opposite one of the entrances of the Zoological Park. When this is all carried out it will furnish a most useful and beautiful road connecting the two institutions. The surfacing of the paths and road built as above described will require a large quantity of broken trap rock and of trap rock screenings, but the principal expense of their construction has already been met by the building of their foundations from surplus stone, much of which was hauled to its place by the excavation contractors, who needed dumps at which to dispose of it.

The delivery road from the main driveway to the rear of the Museum building, alluded to in my last annual report, has also been finished in the same way, except for final surfacing with trap screenings, and has been in use since midsummer. The cinder surface road to the propagating houses on the east side of the grounds has been extended along the western side of the nurseries, but is not yet finished.

#### *Local Telephone Service.*

During the building of the subways and steam pipe connections of the power house with the Museum building and public conservatories in 1899 and 1900 telephone wires were laid connecting these three buildings. During the past summer advantage was taken of the excavation for the water pipes to the stable and propagating houses to lay telephone wires for more than 4,000 feet in the same trenches to these buildings, which were thus all connected with each other. Naturally the system has proved very useful, and has made the need of messengers for local service unnecessary. The wires are underground throughout their entire extent. Their location has been accurately plotted.

Further details of the construction work of all kinds will be found in the report of the Superintendent of Buildings and Grounds hereto appended. The work has been carried on with frequent consultations with the Hon. August Moebus, Commissioner of Parks; his Engineer-in-Chief, Hon. Martin Schenck; his Chief Clerk, Mr. Gunther K. Ackerman, and the Superintendent of Parks, Mr. Peter Gecks, and I desire to express my appreciation of the interest and co-operation of these gentlemen.

The great amount and varied character of construction under way has necessarily put large portions of grounds into an apparently chaotic condition, but the most difficult and expensive work of building both garden and park will be accomplished by the end of the present year if the additional appropriation of \$150,000 asked for by the Commissioner of Parks in November is voted before spring. Comparatively small construction appropriations only will subsequently be required to complete the carrying out of the plans, and most of the area can be rapidly brought into essentially permanent condition.

#### *Care of the Grounds.*

No damage worthy of remark has been done by visitors. The notices forbidding the picking of flowers or breaking of branches from plants either wild or cultivated have been respected, and no arrests for depredations of any kind have been made. Some of the employees have been on guard every Sunday and holiday, largely as a precaution against the spread of fires. Particular attention has been given to the hemlock forest. The drought of 1900 was destructive to trees all over the northeastern United States, and the woods in the garden shared its effects, it having been found necessary during the winter of 1900-1901 to remove many dead trees, although not enough to be missed. On the contrary, very few trees died during the past year, and

these have already mainly been removed. Picnicking in the woods has continued and has not been restricted, except in cases where a large number of people wished to congregate. It has therefore been necessary during the summer and autumn to detail a boy to the work of collecting paper and other rubbish scattered by visitors. Official permits for picnicking have not been given, however.

The forests may be much more certainly and easily preserved after the system of walks and drives planned has been built through them. The greater number of pedestrians will naturally follow the paths, and may be directed to do so when it becomes necessary. The paths and roads at present under construction or already built will serve to lead to the forests at several points at which their extension into and through the forests may next be taken up. It will be preferable to build the forest drives and paths by day laborers under our immediate supervision than under contracts.

The cleaning and watering of the driveways already built have been done by employees of the Park Department.

The lawns and banks have been rolled and mowed by horse and hand mowers and the surface drainage basins have been inspected and cleaned out when necessary.

The grass on the arboretum tract and other undeveloped areas has been cut for hay and stacked in barracks near the stable, more being harvested than needed for our horses. A second barrack, like the one described in my last annual report, was built during the summer.

#### *Library.*

As appears from the report of the Librarian, hereto appended, the library has been increased during the year by 2,482 volumes, besides several thousand pamphlets and parts, the total number of bound volumes being now 11,314. Gifts of books have been numerous and very welcome. They have been duly recorded in the Journal. Gifts of money applied to the purchase of books, and credited to the special book fund, have been made as follows:

W. C. Schermerhorn.....	\$500 00
Mrs. Alfred Corning Clark.....	100 00
Andrew Fletcher .....	25 00
D. O. Mills .....	500 00
J. Pierpont Morgan .....	500 00
Miss Olivia E. Phelps Stokes.....	100 00
Miss Caroline Phelps Stokes.....	100 00
	<hr/>
	\$1,825 00
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The number of books bound during the year is 973. The number of catalogue cards written was over 5,000.

Additional exchanges of publications have been arranged, the number of journals, periodicals and reports now received by us for our own publications being 207.

Under the supplementary agreement with the trustees of Columbia College, dated May 3, 1901, the paleobotanical portion of the college library was deposited with the garden during the summer, and after a critical comparison of it with the shelf lists of the college library I signed a receipt for the books as well as for the fossil plants from the college geological museum under the provisions of the supplementary agreement.

An agreement was made with the Torrey Botanical Club whereby all books and pamphlets received by the club in exchange for its publications now become the property of the garden, the garden on its part granting the members of the club the privileges of its library. By this agreement we receive regularly 31 serials in addition to those brought in by our own publications.

#### *Museums and Herbariums.*

The public museum collections have been largely increased by gifts, exchanges, purchase and by the results of our expeditions. These have been duly reported in the Journal. It has been sought to put the additional specimens into place in the cases, so far as space would permit, as soon as they could be properly mounted, rather than to permit them to accumulate awaiting proper labeling. The labeling has gone forward as rapidly as possible coincident with accuracy, and at the present time comparatively few specimens in any of the public collections remain unsupplied with labels. A commencement has been made on a scheme to cross reference museum specimens to the living plants which yield them, but this valuable educational feature cannot yet be worked out very effectively, owing to the formative condition of both museum collections and the collections of living plants.

The collection of fossil plants deposited with the garden by the trustees of Columbia College, under the supplementary agreement between the two institutions dated May 3, 1901, was set up in the east basement museum hall during the autumn. It consists of about 8,000 specimens, comparatively few of which can yet be displayed for lack of cases. This addition of paleobotany to the subjects under the purview of the garden materially strengthens our educational tender to the public and to students and to investigators. The Columbia College collection is extensive enough to illustrate the development of vegetable life on the earth from the most ancient geological time when plants are known to have existed to the present, not without many gaps, however, which it should be our endeavor to fill as opportunity offers. The placing of the collection with the garden was arranged upon the suggestion of the college authorities, which was cordially received by us, experience having shown that research in paleobotany can better be prosecuted in connection with the science of botany than with geology, besides affording the public an insight to the fascinating problems involved through the agency of a museum open at all times.

The identification of the college specimens by means of a painted symbol, as provided for in agreement above referred to, is going forward, in order to keep them readily distinguishable from specimens the property of the garden, the accumulation of which has already been commenced in co-operation with the Geological Survey of Maryland and from other sources.

The number of specimens received from all sources for the museums and herbarium during the year, in addition to the fossil plants, aggregates 61,614. The number permanently incorporated into the several collections is over 79,000; thus nearly 18,000 specimens previously received have been mounted. These, then, represent the gain made in the sorting and arrangement of specimens carried over from last year in the store rooms. A vast number still remain unstudied, but the gain is encouraging, and work is now so organized that we expect to be able to very materially reduce the unsorted material during 1902. Ten museum aids have assisted the curators in the work, who have also been aided by students and other investigators.

Through an agreement with the Torrey Botanical Club the herbarium accumulated by that society was presented to the garden in the spring. It consists wholly of specimens of plants growing naturally within one hundred miles of New York City, and is a valuable collection on which to build a complete illustration of the local flora. It serves a very useful purpose by saving the main herbarium from the use of local students, and answers their inquiries more rapidly and in many cases more satisfactorily than by reference to the general herbarium.

Contributions of money for the purchase of collections and credited to the museum and herbarium fund have been made as follows:

Andrew Carnegie .....	\$500 00
Samuel Sloan .....	100 00
Samuel D. Babcock.....	250 00
G. S. Bowdoin.....	200 00
Addison Brown.....	100 00
D. O. Mills .....	200 00
Edward D. Adams .....	100 00
George B. Hopkins.....	50 00
Francis Lynde Stetson .....	50 00
Mrs. Esther Herrman .....	100 00
Dr. Henry F. Walker.....	50 00
H. C. von Post.....	100 00
	<hr/>
	\$1,800 00

The contribution of Mr. Carnegie was used for the purchase of the collection of Mr. A. Vignier, of Wiesbaden, Germany, rich in rare Mexican species and in plants of central and northern Europe, including valuable series of seaweeds, lichens and

fungi. The contributions of Messrs. Sloan, Babcock, Bowdoin, Brown, Mills, Adams, Hopkins and Stetson were used in securing a set of the famous collections of Chinese and Formosan specimens, nearly 8,000 in all, accumulated by Dr. A. Henry during several years of exploration. This gives us the best collection of specimens of Chinese plants in America. A somewhat more complete set of Dr. Henry's plants has become the property of the Royal Gardens, Kew, England. The contributions of Mrs. Herrman and Messrs. Walker and von Post have been applied toward purchasing the collection of Prof. F. S. Earle, recently appointed an Assistant Curator of the garden. About \$400 additional is needed to make this purchase complete. The collection is of high scientific value, containing several thousand specimens of fungi, including many type specimens, a nearly complete representation of the flora of the State of Alabama and much material from various localities. It is hoped that means may soon be found to complete its purchase. Additional data concerning work on the museums will be found in the report of the Curator hereto appended.

#### *Laboratories.*

The laboratories supply ample and convenient space for the investigations carried on by members of the staff and by students. Their equipment with furniture and apparatus has gone forward by meeting actual necessities as they have arisen. Here, as in many other parts of the museum building in constant use, the need of additional cases is great. As shown by the appended report of the Director of the Laboratories, twenty-seven students have carried on work during the year under the guidance of members of the scientific staff. Each of these students has been assigned, or has chosen, a special subject for investigation, and many results of scientific or immediate practical value have been reached. Some of these have been published, others await publication. Many students of the two preceding years have honorable positions as teachers or investigators in other institutions. It is proposed to keep a record of the work of students subsequent to their attendance at the garden in so far as this can be obtained—a kind of alumni list. We have been unable to supply students to fill some positions that have been brought to our attention during the year. Dr. Marshall Avery Howe, appointed an Assistant Curator in July, 1901, has been detailed to aid Dr. MacDougal in the charge of the laboratories during part of his time.

#### *Lectures.*

A course of public lectures delivered on Saturday afternoons in the lecture hall of the Museum building was commenced on April 6 and continued until June 29. Another course commenced October 12 and closed November 16. These lectures were attended by appreciative audiences. All members of the garden were notified of the lectures by tickets, and they were at the same time especially invited to visit the garden under escort by members of the staff. A large number of members took advantage of these invitations, and have thus kept in touch with the development of the institution. The lecture courses have been duly recorded in the Journal.

### *Publications.*

Bulletin 6, commencing the second volume, was issued May 27, 1901, containing the reports of officers and committees for the year 1900 and botanical contributions written by members of the staff.

The Journal has been issued monthly throughout the year under the editorship of Dr. MacDougal, and has served to inform our members and the public of the progress of development of the institution. Under authority given by the Scientific Directors it is proposed to increase its size somewhat during the coming year. Nine contributions, written by students and members of the staff, have been reprinted from the Bulletin of the Torrey Botanical Club, in which they were first published, the total number of such contributions being now nineteen.

All our publications have been in demand from other institutions and students all over the world, and their distribution has brought us exchange of books and specimens in value greatly in excess of the cost of publication.

### *Exploration.*

A very large number of living plants and of specimens for the museums and herbarium have been obtained by members of the staff detailed for exploring regions little known botanically, and for visiting other institutions. The expenses of this work have been defrayed in part by appropriations from the general fund, and in part by contributions of money from members of the garden, as follows:

William E. Dodge.....	\$500 00
Samuel Thorne.....	100 00
George W. Perkins.....	250 00
Richard H. Allen.....	100 00
James B. Ford.....	100 00
Very Rev. E. A. Hoffman.....	100 00
Roland G. Mitchell.....	100 00
Adrian Iselin.....	200 00
Isaac Seligman.....	100 00
Robert M. Thompson.....	100 00
N. L. Britton.....	100 00
F. N. Warburg.....	100 00
George Foster Peabody.....	100 00
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	\$2,050 00

Detailed accounts of the exploration work have been published in the Journal. It is mainly by exploration and by visits to other institutions for arranging exchanges that the collections of the garden may now best be built up. Much desirable material can yet naturally be obtained by purchase, but that of the greatest scientific and educa-

tional value must be collected; trained collectors are almost necessary for this purpose, and our own staff supplies the best, for they know what we have already and what we lack. A special exploration fund could now be operated with immense advantage to the garden and to the progress of science.

### *Investigations.*

The development and organization of the facilities of the laboratories, the accession of a large number of books and periodicals to the library, and the additions to the collections of living, preserved and fossil plants has resulted in a direct and marked increase in the efficiency of the garden in carrying out one of its most important functions in the promotion of research.

Not only have the advantages in the several subdivisions of the subject to which attention has been previously directed, been increased, but the appointment of additional members of the staff, and the removal of the paleobotanical collection of Columbia University to the garden have given additional opportunities for the consideration of problems in economic botany. The results of some of the investigations completed have been brought out in the publications of the garden, or in other periodicals, and others are still in press.

Professor L. M. Underwood, of Columbia University, has continued his studies of the ferns and fern allies, and carried out field observations on the flora of Porto Rico and Colorado. Professor Underwood has also exercised supervision over the work of the Columbia students at work in the garden.

Dr. H. H. Rusby, curator of the economic collections, has continued his investigations of the flora of Columbia and Bolivia, and also given much attention to various economic problems.

Dr. D. T. MacDougal, first assistant, has completed his studies in experimental morphology of *Lysimachia*, and published a manual of Plant Physiology containing an outline of the principles of the subject, and such detailed methods of experimentation as to make it an aid to research. He has carried on field work in Montana and Nebraska, making studies of the xerophytix and alpine floras and of geographical distribution. Dr. MacDougal has brought his investigations on the relations of light to growth and development, into a form suitable for publication, and has directed the operations of the laboratories.

Dr. J. K. Small, curator of the museums, has carried forward his work on the flora of the southeastern United States, and made critical studies of a large number of genera occurring in this region. Some field work was done in southern Florida in connection with these studies. The preparation of his manual of the flora of this region has been carried steadily forward and more than half of it has already been printed.



Dr. P. A. Rydberg, assistant curator, has continued his work on the flora of the Rocky Mountains and made critical studies of *Quercus*, *Limmorchis*, *Piperia* and the *Potentilleae*.

Mr. F. S. Earle, assistant curator, has devoted considerable attention to the determination of collections of fungi from Porto Rico, Florida, Colorado, Wyoming and California, and made some critical studies of the *Sphaeriales*, *Hysteriales* and *Agariaceae*.

Dr. M. A. Howe, assistant curator, has been engaged in a general systematic study of the marine algae upon which he has made extensive field observations in Newfoundland and Nova Scotia.

Dr. A. Hollick, assistant curator, has made special studies of the fossil flora of Long Island, and field observations on the flora of the sand dunes of Cape Cod, on the fossil flora of Chappaquidick Island and of the pleitocene flora of the Chesapeake Bay region.

Mr. G. V. Nash, head gardener, has continued his studies of the American grasses, and of cultivated plants, making visits to the Royal Gardens at Kew, and to the southern part of Florida for the purpose of extending the range of his work.

Miss A. M. Vail, librarian, has continued her studies of the *Asclepiadaceae*.

Mrs. N. L. Britton, voluntary assistant, has continued her studies on the mosses of North America, and in conjunction with Miss A. Taylor, made exhaustive morphological examinations of *Schizaea pusilla* and *Vittaria lineata*. The results of the investigations upon the first-named plant have appeared in the contributions of the garden and the second is in press.

Professor F. E. Lloyd, of Teachers' College, has some morphological studies on *Chrysoma* and *Pteridium* and published the results of his survey of the coasts and islands of the Mississippi Sound. His studies on the embryology of the *Rubiaceae* have been brought to completion and are now in press.

Professor E. S. Burgess, of the Normal College, has completed his historical and bibliographical researches on the *Asters*, and made a systematic arrangement of the numerous species in this group in conformity with the results of his studies. The results of this work are now in press.

Dr. C. C. Curtis, of Columbia University, has carried out extensive experiments dealing with the movements and pressures of fluids in plants, and has not yet brought his work to completion.

Dr. Alex. P. Anderson, of Columbia University, has brought to a close his investigations of *Dasyscypha resinaria*, a fungus parasitic on *Abies balsamea*, carried forward his researches upon growth and upon various economic problems.

Miss Alexandrina Taylor, museum aid, carried out a morphological examination of *Schizaea pusilla* and *Vittaria lineata* in conjunction with Mrs. N. L. Britton, and the results have been partly published, as noted above.

Mr. R. S. Williams, museum aid, has made marked progress in his study of the mosses of Montana, in addition to describing several new species from other parts of North America. He has carried out extensive field work in Bolivia, in which he is still engaged.

Mr. S. H. Burnham, museum aid, has devoted considerable attention to a systematic arrangement of the flora of the Champlain valley.

Mr. J. E. Kirkwood, of Syracuse University, has carried forward his studies in the embryology of the Cucurbitaceae, which will not be completed for some time.

Miss V. S. White has completed her work upon the Tylostomataceae, and the results have appeared as a contribution from the garden. Her studies upon the Nidulariaceae have also been brought to a close and the results are now in press. Similar work by her upon the Lycopodiaceae is going forward.

Mr. R. M. Harper has continued his work upon the geographical distribution of the flora of Georgia and made critical studies of some of the genera represented.

Miss Elsie Kupfer has made a complete systematic and morphological study of *Geoplysia* and *Urnula*, and made an examination of some defective cocoanuts. The results of both pieces of work have been published, and the article upon the latter subject has been republished by the government of Jamaica.

Mr. John R. Gardener has made a classification of the Celastraceae of North America in accordance with the results of his examination of the group.

Mr. W. A. Cannon has begun an extensive series of experimental observation and morphological studies upon hybrids which will need some time for completion.

Miss R. J. Rennert has completed her morphological and physiological investigations upon the seedlings of *Arisaema*, and the results will appear as a contribution from the garden.

Miss Julia T. Emerson has taken up an experimental cultural study of the *Fusarium* parasitic on the rose.

My own attention has been given to the further study of the flora of Porto Rico and other West Indian countries. Field observations and a study of the geographical distribution of the plants of St. Kitts have been made, in addition to the critical study of various groups of North American plants. My work upon the systematic arrangement of the flora of northeastern America has resulted in the publication of a manual dealing with the plants of the Northern States and Canada, in which numerous new species have been described and new systematic arrangements established. Attention

has also been given to the guidance of the research work of various students and members of the staff.

Respectfully submitted,

(Signed)

N. L. BRITTON, Director-in-Chief.

#### REPORT OF THE DIRECTOR OF THE ZOOLOGICAL PARK.

During the early stage of every new and complex institution its annual progress is a matter of prime importance to the public.

Throughout the year 1901 the development of the Zoological Park has gone forward with rapidity and precision. By reason of an unusually mild autumn the building season was much longer than usual, and as a result the record of improvements undertaken and completed during the year is surpassed only by that of 1899. With the finishing of the lion house, about July 1, 1902, the Zoological Park will stand about one-half completed, in accordance with the original plan.

#### *National Scope.*

It is gratifying to observe that even thus early in its history the Zoological Park is regarded by many persons outside of New York as an institution of national interest. Unsolicited gifts of many valuable animals have come from many States, far distant from New York, and from Mexico, Cuba, England and Germany. On questions of zoological park development the society's advice has been sought by numerous organizations and municipalities, and requests for our publications have come from all directions.

Because of the undisputed fact that the Zoological Park is not merely a local institution the society has strongly objected to its being locally nicknamed the "Bronx Zoo" or "Zoo" in any form, with or without a prefix. In response to written requests all the newspapers of New York City now mention our institution by its name, Zoological Park.

#### *Attendance.*

During all pleasant weather the attendance of visitors has kept pace with the accommodations for them, and the collections available for their entertainment. Up to this time it has been rather fortunate than otherwise that the transportation lines have not been able to bring larger crowds, for, were the crowds during fine weather much greater than they now are, the present walks and buildings could scarce contain them. It has been proven conclusively that no matter how large our animal buildings may be, the thousands who throng the park in fine weather would crowd them full just the same. It is indeed fortunate that the Primates' House, Lion House, new Sea Lion Pool, Wild Sheep Hill and Osborn's walk will now open up new areas, and lessen the pressure of visitors elsewhere.

In view of the completion of the rapid transit system at an early date, and the great influx of new visitors which the West Farms terminal will inevitably bring, there is not a moment to be lost in securing the last half of the animal buildings that are so imperatively necessary to the park.

The attendance of visitors for the year 1901 was in detail as follows:

January .....	12,483
February .....	16,167
March .....	24,544
April .....	25,822
May .....	50,381
June .....	70,770
July .....	48,375
August .....	74,264
September .....	103,503
October .....	48,995
November .....	32,687
December .....	19,154
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Total .....	527,145
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#### *Primates' House and Lion House.*

The most important event of the year was the completion of the Primates' House and its occupancy. On December 22 it was opened to the public with a collection of 114 primates, representing 42 species.

A full description of this building was published in the Zoological Society Bulletin No. 6.

The Lion House is about one-third complete, and bids fair to prove a very satisfactory structure. Its construction is being pushed quite rapidly, and it should be ready for occupancy by July 1, 1902. Unfortunately it is not possible to collect specimens of the larger felidae and keep them in temporary quarters for any length of time, consequently the animals for the new Lion House cannot be selected and purchased until the building is nearly ready.

#### *New Installation for Animals.*

Mountain Sheep Hill.—The long-deferred plan for a series of inclosures for wild sheep and goats on the rocky hillside immediately west of the Rocking Stone was this year carried out. Originally the hillside was a chaotic mass of earth, old stone walls and granite rock. The valley at the foot of the slope was a prehistoric dumping ground for refuse rock of every description, while hillside and valley were completely overgrown with a tangle of worthless vegetation, chiefly weeds and briar bushes.

But the hillside offered two features of value to an installation for mountain sheep and goats. Height was there, and rough slopes of granite rock; but its successful utilization demanded very careful treatment. In about all other zoological gardens, wild sheep are provided with wholly artificial hills and rocks, built upon level ground, because the work of nature is not there.

The Director of the park was finally authorized to carry out his plan for the development of Mountain Sheep Hill, and by the close of the working season about 75 per cent. of the task had been completed. The rubbish in the valley was hauled away, and utilized elsewhere, and thereby the height of the hill was increased. By a judicious removal of earth and useless vegetation, a fine exposure of pink granite rock was secured along the hillside for a distance of about 400 feet, with a maximum height of twenty-five feet above the valley.

Two dry and warm shelters were constructed in the rocky side of the hill, a third was built in the hill top at its highest point, and a fourth remains to be constructed next spring. A very considerable amount of rock work was built of weathered rock.

Along the bottom and western slopes of the ridge, wire fences were erected, and transverse partitions of the same divided the hill into four spacious inclosures. One of these is now occupied by a pair of Barbary wild sheep, or aoudad, another by a male Himalayan thar (wild goat), and a third is devoted to the pair of mouflon presented by Maurice Egerton, Esq., of London. In their new homes, all these animals show off to most excellent advantage, and seem like different creatures from what they were when kept in ordinary flat corrals. The Page wire fences are so inconspicuous the value to the surrounding landscape of the rugged, rocky hill is not in the least diminished by its practical utilization as a home for wild animals.

The entire cost of this improvement has been borne by the Zoological Society, but the macadam walk in front of it was constructed at the expense of the Ground Improvement Fund.

The Raccoons' Tree.—To accommodate a very interesting American animal, the raccoon—many specimens of which have been in the park ever since the opening day, but poorly exhibited—a very generous arrangement has been effected. At the south end of the bear dens and therefore in close proximity to the raccoons plantigrade relatives, a thrifty young cedar tree has been encircled by a low iron fence with an overhang. Around the trunk of the tree has been built a rustic shelter house, and its eight rooms are now occupied by fourteen raccoons of various ages and degrees of fatness. The animals have an abundance of room, adequate shelter from all kinds of disagreeable weather; they can bathe at will, and except in cold weather, when snugly housed in their winter homes, some of them are always visible to visitors.

New Buffalo Shelter.—Owing to the lack of permanent winter quarters in the proposed Antelope House for the tropical hoofed animals, the buffalo herd is again crowded out of its barn for the entire winter. To provide for the buffaloes, the

Society is now erecting a spacious and permanent rustic shed in the southwest corner of the large corral adjacent to the buffalo entrance. In shape it is a segment of a circle, and when finished, as it will be about January 20, 1902, will be of great value to the buffalo herd.

The Pumas' House.—As a practical test of the belief that pumas and lynxes will thrive better and live longer in the open air than in a heated building, the Society has constructed an open-air installation, of two compartments. It consists of a spacious log cabin, open on the front side, and provided with dry and warm sleeping dens, fully sheltered from inclement weather. In front of this are two large inclosures of wire netting, provided with tree trunks and floored with mother earth. At present these two inclosures contain one puma and two lynxes, all three of which are in the best possible condition, and seem to greatly enjoy their home.

#### *Collections.*

During practically the whole of the year of 1901, the Zoological Park has been in the embarrassing condition of having almost as many species of animals as it could properly house and exhibit. Excepting the hardy hoofed animals, bears, and a few others, it has been necessary to exercise considerable restraint to avoid the acquisition of specimens which could not be housed. For example, a fine tapir which came to us from South America promised to become such an awkward burden if accepted that it was promptly transferred to the Washington Zoological Park.

It has been impossible to accept tropical hoofed animals, large felines, pachyderms, ostriches and emus, perching birds, and birds of prey beyond the original stock. Late in the year, in view of the approaching completion of the Primates' House, an effort was made to bring together a collection of apes, baboons, monkeys and lemurs. The advent of winter found all available space in the Small Mammal House and Tortoise House filled to overflowing with primates, and the gathering of such specimens was temporarily discontinued.

The Society longingly looks forward to the time when, with a complete outfit of buildings and aviaries, it can boldly reach out all over the world for all kinds of living creatures, in the serene consciousness that anything can be accepted, and everything received can be fittingly cared for and exhibited.

#### *Department of Mammals—W. T. Hornaday, Curator; R. L. Ditmars, Assistant.*

In this department, the most noteworthy events of the year were the formation and installation of a collection of primates, the increase of the collection of bears, the importation of a choice lot of mammals from Japan, China and the East Indies, and the purchase of a fine lot of mature North American mammals in Maine, the stocking of the beaver pond and the starting of a collection of wild sheep and goats.

Primates.—On December 22, the new Primates' House was opened to the public with one hundred and fourteen specimens, representing forty-two species, gathered

from a wide range of sources. The rarest and in some respects the most wonderful specimens in the collection are two gelada baboons, the largest size, and in very fine condition. So far as can be learned, these are the only specimens in captivity, and their acquisition was a piece of good fortune. These specimens are native to Southern Abyssinia, but were found in Moscow, Russia, by the son of Carl Hagenback, and purchased by cable at a cost of \$750. Of all the baboons, the gelada is the most wonderful in form and habit, and it is also one of the largest in size. Like most baboons, it is quite ferocious in disposition. Its heavy mane and body mantle of wavy dark brown hair strongly resembles the hair on the shoulders of a musk-ox. Unlike other baboons, its nostrils are placed far back on the muzzle, and the endless grimaces of the animal are quite beyond description.

At one time during the past summer, the collection of anthropoid apes contained five orang-outangs and one chimpanzee. Several of the former were trained to eat at table, in human fashion. During the warm weather daily exhibitions of the largest specimen, Rajah, were given in the open air, before immense crowds of visitors. Unfortunately, in October there occurred among the apes an outbreak of septic ulcerative dysentery, caused by the presence of a deadly microscopic organism known as *balentidium coli*, which caused the death of all the anthropoid apes except the female, called Sally. This animal has been in the park for nearly two and one-half years, and was cured of the dread disease which conquered her companions. Fortunately, we have thus far succeeded in preventing the spread of this disease beyond the group of animals first attacked by it. Just how this deadly protozoan first reached our orang-outangs from its home in the East Indies may never be known, but it is believed that two of the orangs brought it from Borneo. The health of the baboons, monkeys and lemurs is excellent, in spite of the crowded condition in which they had to live prior to December 22.

Believing that members of the society will be interested in knowing fully the zoological value of the collection of primates on exhibition in the Primates' House on the opening day, the following list of species is offered:

*Primate Collection.*

List of species represented in the New York Zoological Park on the opening of the Primates' House, December 22, 1901:

**Anthropoid Apes—**

Orang-Utan (*Simia Satyrus*), Borneo.

**Baboons—**

Gelada (*Theropithecus Gelada*), South Abyssinia.

Hamadryas (*Pap Io Hamadryas*), North Africa.

East African (*Pap Io Thoth Ibeanus*), East Africa.

Long-Armed Yellow (Pap Io Langheldi), Northeast Africa.

Golden (Pap Io Babuin), North Africa.

Mandrill (Pap Io Mormon), West Africa.

#### Old World Monkeys—

"Black Ape" (*Cynopithecus Niger*), Celebes.

Magot: "Barbary Ape" (*Macacus Innus*), North Africa.

Japanese Red-Faced Monkey (*Macacus Fuscatus*), Japan.

Pig-Tailed Monkey (*Macacus Nemestrinus*), East Indies.

Lion-Tailed Monkey (*Macacus Silenus*), India.

Rhesus Monkey (*Macacus Rhesus*), India.

Common Macaque (*Macacus Cynomolgus*), East Indies.

Bonnet Monkey (*Macacus Pileatus*), Ceylon.

Unidentified (young) (*Macacus ?*), East Indies.

Entellus Monkey (*Semnopithecus Entellus*), India.

White-Collared Mangabey (*Cercocebus Collaris*), Africa.

Sooty Mangabey (*Cercocebus Fuliginosus*), Africa.

Moustache Mangabey (*Cercopithecus Cephus*), Africa.

White-Nosed Mangabey (*Cercopithecus Petaurista*), Africa.

Mona Monkey (*Cercopithecus Mona*), Africa.

Green Monkey (*Cercopithecus Callitrichus*), Africa.

Vervet Monkey (*Cercopithecus Pygerthrus*), Africa.

Patas Monkey (*Cercopithecus Patas*), Africa.

#### New World Monkeys—

White-Throated Sapajou (*Cebes Hypoleucus*), South America.

White-Faced Sapajou (*Cebes Lunatus*), South America.

Hooded Sapajou (*Cebes Fatuellus*), South America.

Red-Faced Spider Monkey (*Ateles Paniscus*), South America.

Hooded Spider Monkey (*Ateles Cucullatus*), South America.

Black-Faced Spider Monkey (*Ateles Ater*), South America.

Squirrel Monkey, or Common Marmoset (*Chrysothrix Sciurea*), South America.

Gray Spider Monkey (*Ateles Goffroyi*), South America.

#### Lemurs and Lemuroids—

Spotted Lemur (*Lemur Varius*), Madagascar.

Mongoos Lemur (*Lemur Mungoz*), Madagascar.



Ring-Tailed Lemur (*Lemur Catta*), Madagascar.

Blue-Gray Lemur (*Lemur* ?), Madagascar.

Large-Eyed Lemur (*Lemur* ?), Madagascar.

Black Lemur (*Lemur Macaco*), Madagascar.

Brown Lemur (*Lemur* ?), Madagascar.

Galago (*Galago Galago*), Africa.

Slow Lemur (*Nycticebus Tardigradus*), India.

**Bears.**—The collection of bears is rapidly increasing, both in number and in scientific interest. The efforts put forth to bring together a choice series of representative bears have been very well rewarded, and the present dens are now filled to overflowing. The first object has been to secure a fine series of American specimens, of all species, and also to show all known variations of the American black bear, from jet black to the lightest brown "cinnamon." We next sought Old World species, with several gratifying results.

The two Kadiak bears, presented in 1899 by the Messrs. Niles, have thus far developed finely. The male has completely outgrown the California grizzly of the same age, and although he is less than three years of age, with four years more in which to grow, he is already a very large bear. The coats of the two Kadiaks have now taken on the color and texture of adolescence, and the identity of these specimens as *Ursus Middendorfi* may be considered as beyond doubt.

Mr. J. Alden Loring secured in Alaska two fine grizzly bear cubs and a smooth-coated brown bear, the identity of which remains to be proven by its growth.

Mr. Ferdinand Kaegbehn succeeded in securing for the society a pair of silvery gray *Ursus Arctos* cubs direct from Trebizond, which by reason of their beauty and their good temper are very desirable.

Mr. Carl Hagenbeck presented to the society a fine pair of young hairy-eared bears from Northwestern Mongolia (near the geographical center of Asia), which are of much value. A ten-months-old pair of *Ursus Arctos* from Central Russia, obtained from Mr. Hagenbeck in exchange, are as much like "silver-tip" grizzlies of that age as one species can possibly resemble another. From Mr. Hagenbeck was purchased a pair of Sloth bears, from India, and from Capt. Golding came one Himalayan black bear, two Japanese bears and two Malayan sun bears.

It has been our policy to secure young bears and rear them in our own dens, taking great care to avoid the development of bad temper and also to secure the finest possible growth. In the preservation of ursine temper much has been gained by strictly prohibiting the feeding of bears by visitors. At present about one-half of our thirty bears are immature, but all save the polars are so good-natured that the keepers

enter their dens and drive them to and fro like so many sheep. What is of equal importance, bears that are reared together play with each other instead of fighting.

The following list of the species and varieties of bears now represented in the park collection may be of interest:

*Bears in the Zoological Park January 1, 1902.*

- 2 Polars, from Nova Zembla (*Tharlarctos Maritimus*).
- 2 Kadiak, from Alaska (*Ursus Middendorffi*).
- 1 Grizzly, from Colorado (*Ursus Horribilis*).
- 1 Grizzly, from Juneau, Alaska (*Ursus Horribilis*).
- 1 Grizzly, from Porcupine, Alaska (*Ursus Horribilis*).
- 1 Black Bear, from Maine (*Ursus Americanus*).
- 1 Black Bear, from New York.
- 1 Black Bear, from Pennsylvania.
- 1 Black Bear, from Virginia.
- 1 Black Bear, from Florida.
- 1 Black Bear, from W. Ontario (Brown var.).
- 1 Black Bear, from Mexico.
- 1 Black Bear, from Colorado (Cinnamon var.).
- 1 Black Bear, from Washington (Cinnamon var.).
- 1 Black Bear, from British Columbia.
- 1 Black Bear, from S. Alaska (Brown var.).
- 2 Brown Bears, from Asiatic Turkey (*Ursus Arctos*).
- 2 Brown Bears, from Central Russia (*Ursus Arctos*).
- 2 Hairy-Eared Bears, from Northwestern Mongolia (*Ursus Piscator*, Puch.).
- 1 Himalayan Black Bear (*Ursus Torquatus*).
- 2 Japanese Bears, from Japan (*Ursus Japonicus*).
- 2 Sloth Bears, from India (*Ursus Labiatus*).
- 1 Sun Bear, from Borneo (*Ursus Malayanus*).

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30 specimens, representing 10 species.

Prong-Horned Antelope Herd.—Although it is risky to make at this time any statement regarding our herd of Prong-Horned Antelope, nevertheless our success with it during the past year gives us reason to hope that this species can survive here without being attacked by gastro-enteritis.

A year ago last summer we started a new herd of antelope with ten specimens, about one-half of them adult. Owing to the loss of all those previously allowed to

graze on green grass in the range, we decided to try the experiment of keeping a herd in a corral containing no grass, feeding it chiefly on dry food and carefully regulating the supply of green grass.

This policy was carried out, and the result has been very gratifying. There has been no occurrence of gastro-enteritis. Three deaths have occurred in the herd, two being due to accidents and one to fighting. The remaining seven animals of the original herd are in as fine physical condition as if they had all this time been living in their home country. They are so fat, in fine pelage, lively and so vigorously playful that their attentions to their keepers are a positive annoyance.

Our experiments with moose, male deer and Columbian black-tailed deer have not been as successful as we had hoped, on account of all three of these specimens having been persistently subject to gastro-enteritis, a disease which in them seems incurable. Pending further studies into the causes and prevention of that malady we will not now renew our stock of moose, but we expect to do so at a later period.

The Beaver Colony.—After unexpected delays and postponements the beaver pond finally received a stock of animals, and to-day it is one of the most interesting of the minor attractions of the park. Several specimens came from Brownsville, Texas, and one from Colorado. Mr. Hugh J. Chisholm presented a very handsome pair which came from Canada, and later in the year three more from Maine. A very characteristic dam, about forty feet long, with an up-stream curve, has been built by the beavers at the lower end of the pond of poles and sticks which they have cut and peeled, small stones and mud gathered from the bottom of the pond. In the center of the pond the animals have built a very comfortable house about four feet high of mud and sticks. In cutting the saplings and trees left for them in the inclosure the beavers began with the smallest, and have now cut everything under six inches in diameter. The larger trees are now being attacked, and are going, one by one.

During his autumn vacation Mr. E. R. Sanborn, the park photographer, discovered in a toothpick factory an unlimited supply of green birch bark, such as beavers love to feed upon, and immediately shipped to the park a quantity for trial. The beavers have manifested a great fondness for it, and it is now supplied to them regularly in small piles placed on the banks of the pond. Even in the middle of the day they are seen to leave the water, gravely march up to the piles of birch bark, fill their mouths with the largest pieces available and solemnly stride back to the water to consume them.

Gifts.—The most noteworthy gifts of mammals during the year were the following:

- 1 pair mouflon, from Maurice Egerton, London.
- 1 pair Siberian brown bears, from Carl Hagenbeck, Hamburg.
- 5 beaver, from Hugh J. Chisholm.
- 1 elk, from Knox Taylor, Ketchum, Idaho.
- 1 black bear, from Senor Cruz E. Gonzalez, Chihuahua, Mexico.

- 2 cocomistles, from Charles Sheldon, Chihuahua, Mexico.
- 1 Mearns' coyote, from Charles Sheldon, Chihuahua, Mexico.
- 1 ferret, from Charles Sheldon, Chihuahua, Mexico.
- 1 badger, from Charles Sheldon, Chihuahua, Mexico.
- 1 Mexican gray fox, from Charles Sheldon, Chihuahua, Mexico.
- 1 Western yellow-haired porcupine, from W. T. Hornaday.
- 1 Florida deer, from Mrs. Arthur Duane, Sharon, Conn.
- 1 Virginia deer, from Frederick D. Camp, New York City.

At Merrymeeting Park, Maine, were purchased 3 buffaloes, 2 adult woodland caribou, 1 antelope, 3 elk, 3 white-tailed deer, 1 black bear, 3 gray wolves, 2 foxes, 3 raccoons and 3 porcupines, all of which were in fine condition and were added to the groups of those species already on hand.

A number of rare and valuable ungulates were acquired during the year, the following being by purchase: 7 Newfoundland Caribou Fawns, through the kind offices of Robert L. Mare, Esq., of St. John's, Newfoundland; 1 Anoa, 1 Sika Deer, 2 Sambar Deer, 1 Equine Deer, 1 Chinese Water Deer, 2 Aoudad, 1 Himalayan Thar and 6 Prong-horn Antelope. A fine female equine deer was received in exchange from the Philadelphia Zoological Society, and a llama is expected shortly from the Washington Zoological Park.

During the summer Mr. Raymond L. Ditmars was appointed assistant to the Director in the Mammal Department, and this arrangement has proven to be admirably adapted to the needs of the park. Mr. Ditmars has rapidly acquired knowledge of the details of his new line of duties, which are merely supplementary to his work as Assistant Curator, in charge of reptiles, and there is thus opened to him a wider field of usefulness to the Society.

Excepting the two epidemic diseases, gastro-enteritis and septic ulcerative dysentery, the mammals of the park have been satisfactorily free from serious diseases during the year. All the bears, wolves, foxes, otters, cats, rodents, antelope, elk, buffalo, tropical ungulates of all kinds, European deer, baboons, monkeys and lemurs, are, with but few and trifling exceptions, in prime condition. The following is a statement of the species and specimens on hand December 21, 1901:

	Species.	Specimens.
Primates .....	42	114
Carnivora .....	26	73
Pinnipedia .....	1	3
Rodentia .....	16	126
Ungulata .....	22	90

	Species.	Specimens
Edentata .....	1	1
Marsupialia .....	2	9
	<hr/>	<hr/>
	110	416
	<hr/>	<hr/>
Received by gift.....		85
Purchased .....		274
Born .....		20
On deposit .....		12
		<hr/>

*Department of Birds—C. William Beebe, Assistant Curator, in Charge.*

The most important addition to the Bird Department during the past year was the erection of the temporary pheasants' aviary, presented by the heirs of Samuel B. Schieffelin. The structure consists of a long narrow building, with spacious runways in front, each wire inclosure measuring 6 by 28 feet. Forty-five specimens of pheasants now occupy these new quarters, also flocks of jungle fowl and California quail.

Notwithstanding the temporary nature of this installation, it is a very welcome addition to our accommodations for birds, and its feathered occupants are perfectly comfortable.

During the summer, the burrowing owls were installed in an outdoor cage, where they soon dug a burrow, well-sheltered from storms, and it is hoped a colony of these curious birds will soon be established here.

As a whole, the birds in the collection have settled down to contented lives, and considering that the past year was the first in which they have been free from constant disturbance by blasting and construction, the number of species which have bred is remarkable. Fourteen species have reared living young, while seven others have deposited eggs.

Those which bred are as follows:

European Herring Gull,  
Smaragd Duck,  
Mallard Duck,  
Canada Goose,  
California Quail,  
Wild Turkey,  
Black-Shouldered Peacock,

Reeves' Pheasant,  
Amherst Pheasant,  
Golden Pheasant,  
Silver Pheasant,  
Ring-necked Pheasant,  
Red Jungle Fowl,  
Ring-Dove.

The following laid eggs, but through various causes were unable to hatch and rear their young:

Black Duck,	Screech Owl,
Wood Duck,	Burrowing Owl,
Indian Peacock,	American Magpie.
Bob White,	

The fourteen species which bred are referable to six different orders, a fact which may be regarded as proof of the very satisfactory manner in which the sheltered confines of Birds' Valley have been adapted to the needs of birds, which, in their wild breeding places represent almost every quarter of the world.

At one time during the year it was thought that an Ostrich House would be erected and finished by December, but this hope was not realized. It is full time, however, that the Bird Department should be provided with two more substantial buildings, heated in winter, and about four large aviaries, for the present situation is rapidly becoming intolerable. During the winter tropical birds are housed in the Caribou House, Pelican House and in the old Reptile House lunch room. Under present conditions it is impossible to permit the bird collections to increase to an appreciable extent.

Notwithstanding a total lack of proper aviary facilities for perching birds, Mr. Beebe and his assistants in the Bird Department collected during the breeding season the nestlings of about fifteen species of wild birds and reared them by hand, quite successfully. The amount of labor and close attention requisite in such a task may be estimated by the fact that the majority of these young birds required to be fed by hand every hour. The most interesting broods were crows, owls, woodpeckers, robins, black-birds, orioles, kingfishers, starlings, tanagers and bluejays. All these broods were placed on exhibition as soon as it was safe to do so, and they attracted a great amount of attention, particularly from children. The kingfishers alone defied all attempts to bring them to maturity.

Mr. Beebe's studies and persistent investigations of the diseases of birds, and their treatment, have yielded many valuable results. Out of a list of twenty-seven organic diseases which have caused deaths among the birds, all but seven have at last yielded to treatment. Among these seven are tuberculosis, advanced gangrene, a peculiar foot disease and a stomachic trouble. The two last mentioned will doubtless soon be added to the list of cures. Detailed study has been given to this subject, and the results show that the deaths during recent months have been mainly due to such four-footed pests as cats, weasels and rats and to accidents.

Although as yet no new bird houses have been constructed, by constant effort to meet the conditions demanded in crowded cages and the kindly dispositions of the birds themselves, many species have been successfully caged together. In this way

room has been found for the 229 gifts and 270 purchases which, with 79 specimens collected by members of the department, comprise the 499 additions to the collection during the past year.

Among the most important of these additions may be mentioned the following:

Gifts—2 Jungle Fowl, 2 Black-winged Peacocks, 1 Guan, 1 Crested Curassow and 1 Crowned Pigeon, from Homer Davenport; 22 Scaled Quails, 1 Golden Eagle and 4 Western Red-tailed Hawks, from Charles Sheldon; 4 Yellow-crowned and 4 Black-crowned Night Herons, from C. D. Brown, and 2 Banded Fruit Pigeons, from Mason Mitchell.

Purchases—1 Whooping Crane, 2 Sandhill Cranes and 5 Demoiselle Cranes; 12 Brown Pelicans, 4 American Flamingoes, 4 Roseate Spoon-bills, 2 Javan Peacocks, 2 Ring-necked, 2 Peacock Pheasants and 2 Mongolian Pheasants; 1 Brazilian Eagle and 2 Chinese Geese.

The rarest specimen received during the year was an albino Bob-White (*Colinus Virginianus*), captured in southern Oklahoma, and presented by Mr. Charles Payne, of Wichita, Kansas. Amongst quails, albinism appears to be of exceedingly rare occurrence, and Mr. Payne declares that this bird is "one out of two million."

To the Bird Department the most important gift of the year was \$300 in cash received from Miss Caroline Phelps Stokes for the purchase of ornithological books. The invaluable aid this will afford in the study of the habits and the care of birds may be judged by the titles of the books as given elsewhere in the annual list of gifts to the Society.

On December 20, 1901, the Bird Department contained the following birds:

Order.	Species.	Specimens.
1. Ratitae .....	1	3
2. Pygopodes .....	1	1
3. Longipennes .....	5	20
4. Steganopodes .....	4	20
5. Anseres .....	26	220
6. Odontoglossae .....	2	8
7. Herodiones .....	14	42
8. Paludicolas .....	4	11
9. Gallinae .....	21	101
10. Columbæ .....	3	8
11. Raptores .....	18	63
12. Psittaci .....	15	24
13. Coccoyges .....	1	2

	Species.	Specimens.
14. Pici .....	2	4
15. Passeres .....	44	145
	<hr/>	<hr/>
	161	677
	<hr/>	<hr/>

	Specimens.
Received by gift.....	229
Purchased .....	270
Collected .....	79
Hatched .....	199
	<hr/>

Net gain during year, 57 species, 252 specimens.

*Department of Reptiles—Raymond L. Ditmars, Assistant Curator, in Charge.*

During the past year this Department has maintained the highest standard it reached last year, and its report for the year is excellent. Fortunately for all concerned, its equipment of installations, excepting the Tortoise House, was complete at the opening of the park. All its cages are kept well filled and its most valuable specimens seem destined to live longest.

It is a source of gratification to be able to report that notwithstanding the large number of venomous serpents in the collection no accidents from them have occurred to any of the men in charge.

The most noteworthy accession in this Department during the year was the purchase of five giant tortoises from the Galapagos Islands. These very interesting specimens will be specially described elsewhere by the Assistant Curator. It is a satisfaction to be able to report that the largest and most valuable of the giant tortoises has greatly improved in health since his arrival at the park last summer and is much stronger than six months ago. Now that the monkeys have been removed from the Tortoise House to their own permanent building the former will be speedily fitted up for its rightful occupants.

Among other important additions made to the collections during the year may be mentioned a giant alligator turtle from Plaquemine, Louisiana, weighing 110 pounds; two Cuban crocodiles, from Cuba, gift of Capt. A. G. Hammond, Eighth United States Cavalry; a black iguana, from the Bahamas, gift of Mr. A. Van Winkle; a very large monitor lizard, or "Kabra Goya," from Ceylon, and three red rattlesnakes, from California.

In the month of June Curator Ditmars and Keeper Charles Snyder again spent their vacation in South Carolina, where they collected 134 serpents, 271 lizards and 4 chelonians. Thanks to their enterprise, our collection of Southern water snakes is particularly fine.



In the care of a collection of reptiles one of the most difficult tasks is the supplying of acceptable food. Aside from the matter of cost, there are many times when the men of the reptile department are taxed to the limit of their ingenuity to obtain a sufficient supply of the right kinds of food. Not long since it was necessary to kill a number of young rattlesnakes that were born in the Reptile House because of the impossibility of securing enough mice with which to feed them.

It should be stated that the birds and quadrupeds used are killed before being offered as food. Reptiles do not require live food, but in order to swallow an animal satisfactorily it is best that it be offered while warm and before rigor mortis has set in.

The following memorandum has been compiled by Mr. Ditmars and Mr. Snyder to show the quantities of certain kinds of reptilian food used during the past year:

389 mice.	408 frogs.
1,410 rats.	26,900 live fish.
366 rabbits.	18,000 meal worms.
1,273 English sparrows.	55 pounds earthworms.
531 pigeons.	122 large pumpkins.
232 chickens.	2,266 pounds green vegetables, grass not counted.
812 toads.	

At the close of the year the state of the reptilian collections on hand were as follows:

Order.	Species.	Specimens.
Crocodylia .....	2	31
Chelonia .....	24	119
Lacertilia .....	15	75
Ophidia .....	44	296
	85	521
Batrachians .....	13	78
Totals .....	98	599

	Specimens.
Received by gift .....	524
Purchased .....	183
Collected .....	434
Born .....	97

*Summary of Live Animals on Hand on January 1, 1902.*

	Species.	Specimens.
Mammals .....	110	416
Birds .....	161	677
Reptiles .....	98	599
Total .....	369	1,692

	Specimens.
Received by gift during the year.....	888
Received by purchase.....	727
Born in the park.....	316
Collected .....	513
On deposit .....	12

*Department of Administration—H. R. Mitchell, Chief Clerk.*

With the growth of the park the burdensome details of administration naturally increase also. During the past year, however, facilities for doing business have also been increased.

**Service Building.**—In August the new Service building was completed and immediately occupied by the administration staff, other than the curators, much to the relief of all concerned. The Director, Chief Clerk and their office assistants, Mr. Dickinson and Miss Morris, occupy Rooms 1, 2 and 3, in the eastern half of the building. On the ground floor Room 4 is the Storekeeper's room, for the receipt and issue of all stores and supplies, except food and building materials, and for the storage of tools. Room 5 is the cook room, where all cooked foods, meats and fish for the animals are prepared and issued to the keepers. Room 6 is the food storeroom, and No. 7 is Ice House B.

On the upper floor are the offices of the Chief Forester and Constructor, the Civil Engineer, the society's Photographer and Assistant Editor, the Medical Assistant, the Label Writer and the store rooms for publications and stationery.

In the rear of the Service building is a spacious paved yard, inclosed on three sides by workshops and storerooms, which stand in the following order:

East side, paint shop, general storage; west side, plumber, blacksmith, carpenters; rear, dissecting room, vehicles, Forestry Department barn, lumber storage.

The Service building is connected by park telephone lines with every large building in the park, the Nursery and each entrance pavilion. Two fire hydrants are within 300 feet of the building. A fire alarm gong has been placed on the front of the building, and a 2½-inch hose and chemical fire extinguishers are accessible within.

The building is heated by steam, will shortly be lighted by electricity and is entirely isolated from workshops liable to catch fire. The Chief Clerk's office contains good safes, and every reasonable precaution is observed against both fire and thieves.

**The Rocking-Stone Restaurant.**—This restaurant was opened on Decoration Day, 1901, with a first-class diningroom and a lunchroom, and so far has given complete satisfaction, save on the few occasions when it was overcrowded by patrons. The first care of the society is that the public shall be well served at reasonable prices, regardless of questions of profit and loss. It is only fair to state that the meals served in the diningroom are in every respect as fine as can be obtained in almost any first-class restaurant down town. The restaurant, sodawater stands and the candy stand are managed by the society, and all are under the personal supervision of Mr. Mitchell. A report of the gross amount of business done by these places during the year will appear in the Treasurer's report. On the whole, the amount of business done by these privileges during the past year has been quite as much as could be expected at this early stage of the park's existence. Mr. Mitchell is entitled to great credit for the measure of success that he has already achieved in the management of these difficult features and for the very substantial sum that has been accumulated during the past year, through his efforts, to the benefit of the Annual Fund. Even for its first year the Rocking-Stone Restaurant seems likely to pay its own expenses, and there is little probability that the society will be called upon to make good a loss, as was originally apprehended.

At the close of the year the business of the Chief Clerk's office was found to be well up to date and his books of account, voucher files and financial reports in perfect order.

**Soda Fountains.**—The necessity for another soda fountain in the park became apparent, and one was established by Mr. Mitchell in the Shelter Pavilion, near the fox dens, where it was well patronized.

A candy pavilion was erected at the bear dens.

*Department of Forestry and Gardening—Herman W. Merkel, Chief Forester.*

This Department has been conducted with the usual degree of energy and success. Its work naturally falls into six subdivisions:

1. Park service, such as keeping the park clean of refuse of every description and supplying extra labor to all other departments.
2. Supplying vegetable food, ice, live animal food, etc.
3. Pruning, planting, mowing and caring for ponds.
4. Grading and seeding new areas and walk borders, erecting guards.
5. Hothouse work.
6. Rearing of animal food for animals.

All this work is thoroughly systematized and proceeds with regularity and precision. During the year 1901, in addition to the above, a large amount of ground improvement work was executed under the personal supervision of Mr. Merkel and paid for out of the ground improvement fund, all of which is listed under the head of "Miscellaneous Ground Improvements by the Park Department." This secured far better and more artistic results, and at lower cost, than could possibly have been obtained through advance specifications and a large number of petty contracts.

As stated in a previous report, the cost and trouble of keeping on hand constant supplies of fresh vegetables for animal food led last year to the establishment at the Nursery of a vegetable garden. The results of this experiment were so very satisfactory in every way, and proved so great a saving in cash expenditure, that it was decided to go a step farther and see what could be done in rearing rabbits, pigeons, rats, mice, guinea pigs and chickens for the reptiles and the small carnivorous animals requiring a regular supply of whole animal food. This idea was carried into effect by the conversion of one of the pheasant houses presented by the heirs of Mr. Samuel B. Schieffelin into a poultry house 60 by 18 feet, with wire-inclosed runways on one side.

It has been demonstrated that, on an average, the animals mentioned above can be bred and reared in the nursery for less than one-half what it costs to purchase them in the market, and the constant availability of this supply is a great advantage to the animals for which it is provided.

A brief summary of the maintenance work of the Forestry and Gardening Department is as follows:

Harvested, stored and distributed 275 tons of ice.

Laid stone walls under boundary and range fences along the Southern Boulevard and other places, covered with earth, seeded and sodded.

Reconstructed the entire telephone system. Established satisfactory metallic circuits. Installed five new telephones and equipped Service building with speaking tubes.

Constructed large poultry house, 60 by 18 feet, with wire yards connecting.

Built rabbit warrens, pigeon coops and nest boxes for rats and mice.

Reared and distributed about \$400 worth of live animals for animal food.

Maintained in the Nursery 7,000 trees, 18,000 shrubs and vines and 4,000 perennials.

Raised and distributed in the park over \$1,000 worth of vegetables for animal food.

Cut, cured and stacked 20 tons of hay.

Stocked new greenhouse at Nursery, propagated a large number of new plants and restored to a healthy condition great numbers of plants that had become enfeebled through their life in animal buildings.

Supplied moose, caribou and various other animals with "browse" throughout the year.

Pruned about 700 forest trees.

Planted about 575 trees and 4,000 shrubs, vines and perennials.

Maintained plant decorations in the various buildings up to the standards set the previous year, and in many cases improved upon them.

Combated tent caterpillar pest, cutting out and burning over 6,000 "tents."

*Department of Construction and Repair—Herman W. Merkel, Acting Chief Constructor.*

From March 1 until December 1 this Department furnished employment for a large force of men and completed many very necessary and important tasks. On September 15 Mr. S. P. Senior resigned from the position of Chief Constructor to accept a position elsewhere, after having rendered to the society one year of very efficient and satisfactory service. It was then decided to place this Department under the direction of Mr. Merkel as Acting Chief Constructor, and this action has resulted very satisfactorily in every way. If it continues to be possible for Mr. Merkel to give to this Department, as well as to his own, the amount of personal supervision which it requires the present arrangement doubtless will be made permanent.

The most important items of service rendered to the Zoological Society, at its expense, were the following:

The development of Mountain Sheep Hill and inclosures.

The construction of shelter shed for buffalo herd.

The construction of workshops and storehouses in the sheds around Service Yard.

The construction of a raccoon's installation.

The placing of additional radiators in Tortoise House.

Construction of plank walks leading to Primates' House.

The work under the supervision of this Department by the co-operation of the Park Department for the Borough of The Bronx, and paid for out of the Ground Improvement Fund furnished by the City, will be listed elsewhere under the head of "Improvements by the Park Department." On account of the number of small items of work to be done and the extreme difficulty of securing the best results by means of contracts, it became apparent both to the Commissioner and the Zoological Society that the interests of the public required that certain kinds of work should be performed under the personal superintendence of Zoological Park officers. This applies with particular force to tree planting, the construction of walks amongst trees, the landscape work on pond borders, fence building, etc.

*Civil Engineering Department—George M. Beerbower, Engineer.*

During the first half of the year 1901 the Park Engineer surveyed, plotted and staked out Osborn's Walk, Axis Deer Walk, the completion of the sewer system,

Beaver Valley Walk, the Motor Road extension, Moose Pond and four new dens for bears. He prepared plans for the wrought iron fence around the Raccoons' Tree, which design is the most satisfactory overhang fence that has thus far been constructed for the park.

During the latter half of the year Mr. Beerbower obtained several months' leave of absence without pay in order to make important railroad survey in the West. On his return he began to prepare working drawings for the four new bear dens that are to be built as early as possible in 1902.

*Improvements and Expenditures by the Park Department.*

Concerning the City's share of work in the development of the Zoological Park the year 1901 has been the most important thus far. It has witnessed the completion of two contracts let last year, the letting of five new contracts and the completion of four of them. Besides all this, an immense amount of miscellaneous work has been done. A brief summary of all this work is in order.

*Old Contracts Completed.*

The Rocking-Stone Restaurant, built by Ryan & McFerran, opened on	
Decoration Day, cost.....	\$17,300 00
The Service Building, built by Wilbur T. Wright, occupied in August, cost	12,900 00

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*New Contracts Let.*

The Primates' House contract was let on January 24, 1901, to Thomas Cockerill & Son at \$59,700. From the beginning, on February 10, work on this building has been pushed with commendable diligence and in a manner highly satisfactory to the Zoological Society. Mr. Cockerill has taken the greatest pains to secure the best and most satisfactory results both in materials and workmanship, and it is only fair to say that the same spirit has been manifested by all the subcontractors. From the beginning of work down to the finish there has been no delays except such as were caused by accidents and none of any kind worthy of mention. On the whole the society feels greatly indebted to Mr. Cockerill and his subcontractors for the gratifying results they have produced in the construction of this building.

The Primates' House was opened to the Board of Managers of the Society and Park Commissioners Moebus, Clausen and Brower for a private view on December 21 and on December 22 at 10 o'clock, 115 specimens of apes, baboons, monkeys and lemurs, representing 42 species, gathered from the tropics of Asia, Africa, South and Central America. A full description of this building appears in the Zoological Society Bulletin No. 6. The total cost of the structure is \$64,160.

The Lion House contract was let on July 11 to Thomas F. Cockerill & Son at \$134,500\* and work began on July 20. By December 25 about 30 per cent. of the

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\*This sum does not include the animal sculptures nor the architects' commission.

construction had been completed and work was progressing as rapidly as climatic conditions would permit. This building should be completed and ready to receive its collection of lions, tigers, leopards and other large felines about July 1, 1902.

**Sewer and Water Systems.**—On June 13 a contract was made with Stone & Thurston for the construction of a trunk sewer, with various branches and additional water supply lines calculated to render both the sewers and water systems of the park practically complete. The amount of the contract for both was \$10,406.

Starting in at West Farms, an 18-inch trunk sewer of vitrified pipe was laid in concrete through the lower Buffalo Range, along the eastern foot of Rocking-Stone Hill, past the Polar Bears' Den and the Beaver Pond and westward across the head of Beaver Valley. One branch was built along the eastern side of Baird Court to the north end of the Primates' House. The main line went through the Elephant Corrals to the south end of the Lion House, and another branch led up to the end of the Reptile House sewer near the Wolf Dens. A short line was built from Kingsbridge road to the site of the Antelope House and another drained the stagnant pond in the Buffalo Range. Naturally the final acquisition of a complete sewer system, with all large buildings properly connected with it, is a very great relief to the park, and beyond doubt the general health of both men and animals will be promoted. The total length of the sewers laid in the park under this contract was 5,369 feet. All that now remains in sewer construction is the short laterals to connect new buildings as they are erected.

The principal water lines constructed consisted of 4-inch mains leading to the Lions' and Primates' houses and the site of the Elephant House. Advantage was taken of this opportunity to form a junction between the Bird House main (6-inch) and the 4-inch main entering the park through the Elk Range. The complete circuit thus made constitutes a timely precaution against any cutting off of the water supply of an important building. If one main meets with an accident and becomes inoperative the other will supply the entire system. The total length of water lines put down was 1,754 feet, with 24 manholes and 3 fire hydrants, under this contract.

**Dam at Waterfall.**—Early in the year the pressure of flood water against an old stone foundation at the waterfall made a clean breach in the wall. In a few hours thereafter Lake Agassiz was a malarious expanse of mud with a narrow stream running through it. To have repaired the old wall in a substantial manner would have cost about \$1,000, and in view of the important improvement about to be made at the lower end of the lake the money thus expended would have been thrown away. **Inasmuch** as funds were available for the long-contemplated improvement at the waterfall, Commissioner Moebus recommended the immediate execution of the work, in which the society heartily concurred.

Chief Engineer Schenck immediately prepared working plans and specifications for the erection of a concrete and stone dam about 190 feet long extending from the most northerly point of the waterfall across to the rocky face of Wilson's Hill, in

accordance with the general plan worked out in 1897 by Landscape Architect Charles N. Lowrie. A contract for the work was let on June 13 to J. C. Rogers, Jr., at \$6,080 and completed in a satisfactory manner in December, 1901. A heavy core of concrete was constructed throughout the entire distance from the waterfall to Wilson's Hill, and excepting for a 20-foot spillway near its north end was raised two feet above the water level. The quantity of concrete and stone masonry required was 1,050 cubic yards, filling 1,100 yards, excavating 1,300 yards. Between the spillway and the waterfall an island was created to bear trees and shrubbery, and the masonry was covered with top soil to a depth of one foot. Beneath the spillway the exposed face of the dam has been built of weathered rock laid in rustic form, and the small cascade thus created is a very pleasing new feature, in direct line of vision from the bridge which spans the river at the northeast entrance.

The completion of this improvement accomplishes several important results. It increases the water area in Lake Agassiz by one-third; it adds very greatly to the beauty of that spot; the accidental emptying of the lake is now impossible; an unsightly area of ground is now covered by water, and, lastly, the massive wasteway and 36-inch cast-iron valve built into the dam now renders it an easy matter to drain the lake whenever necessary.

In the spring a very considerable amount of grading, regulating and planting must be done by the park force under Mr. Merkel to provide the necessary turf, vines, shrubbery and trees that are absolutely necessary on the two islands and the adjacent shores. The cost of this must necessarily be provided by a new appropriation for miscellaneous ground improvements.

Motor Road and Tree Trenches.—The imperative need of a service road leading into the north end of the park, providing for the approach of heavy teams and carts to the bird house and the buildings on Baird Court, hastened the construction of the northern third of the line to be used by automobiles carrying visitors, and generally known as the Motor road. On June 13 a contract was made with J. H. Devlin for the construction of a Telford macadam road 16 feet wide and 1,663 feet in length, at a cost of \$6,477. This also included the excavation of a series of tree trenches in Baird Court for shade trees, and filling them with top soil.

The new road leaves the old service road in a "Y" opposite the southeast corner of the moose range, runs along the western side of Board Court, and the eastern side of the ducks' aviary, and terminates in a roomy oval between the eastern end of Cope Lake and what will shortly be the carriage entrance. From this terminus, park automobiles will, at no distant day, run through the park to the rapid transit terminal station at West Farms. It now remains to complete this line by the construction of its eastern third, from the Rocking Stone Restaurant to the buffalo entrance.

In Baird Court 680 running feet of trees trenches were excavated to a depth of four feet and filled with good soil, and in addition to this 500 cubic yards of soil was



furnished for trenches requiring no excavation. Mr. Devlin's contract as a whole was finished in December, 1901.

*Miscellaneous Ground Improvements—Made Under the Superintendence of Park Officers.*

Mentioned in the order of their importance, the items of work done by day labor in the park were as follows:

Osborn's Walk, 20 feet wide and 656 feet long, graded and macadamized (Telford plan), from the Baird house to the north end of the mule deer range. This gives a fine, spacious, direct entrance to Baird Court and the interior of the park.

Service Road to Baird Court.—In order to make it possible for building materials to reach the new buildings on Baird Court, it was necessary to construct a substantial macadam service road, leading from a temporary entrance on Pelham avenue, near the Bronx river bridge. This road is 16 feet wide and 660 feet long. While it required a considerable amount of labor and material, it will remain in active service until all construction on Baird Court, the Concourse and the carriage entrance has been completed when it will be obliterated. It was laid out on a course which will not obstruct other road making.

A Fence Around Baird Court was constructed in order to isolate that region from the grounds accessible to the public. This was necessary to prevent accidents and to facilitate the work of contractors. Adding to this the various other wire fences erected in the park during the year the total length of lines constructed is 6,200 feet.

Mountain Sheep Walk, 16 feet wide and 473 feet long, along the eastern side of the wild sheep inclosures.

Axis Deer Walk and connections with the ducks' aviary, 16 feet wide, total length, 542 feet.

Birds' Valley Walk, from the bird house to the service road, 740 feet, was raised 6 inches, thoroughly drained and resurfaced, leaving it in first-class condition.

Moose Pond.—In the southeastern corner of the moose range a low and boggy spot was excavated, lined with stone and gravel, and made into a fine pond four and one-half feet deep. This is to promote the health and comfort of whatever animals may inhabit the moose range.

Walks All Around the Rocking Stone Restaurant were constructed; also a rough stone retaining wall in front of the building requiring 860 cubic feet of stone.

An area was blasted out of solid rock to enable teams to reach the kitchen door of the restaurant, and a wooden railing was erected around it.

A Candy Pavilion was erected at the bear dens.

A Rustic Stone Drinking Fountain was also constructed at the bear dens.

Walks of plank and macadam were built leading to and around the soda fountain at the reptile house, and also leading to the shelter pavilion near the fox dens.

Shade trees of many species indigenous to New England were planted along exposed walks, in front of animal inclosures and in border plantations along the Southern Boulevard and Kingsbridge road. These plantings have thriven, and in the shortest time possible will add very greatly to the personal comfort of visitors, the comfort of captive animals and the beauty and seclusion of the park.

About 3,200 shrubs, vines and perennials were planted on the banks of Cope Lake, in the ducks' aviary, and in front of buildings, dens and aviaries.

About 5,000 feet of walk borders were graded and filled, top soiled and seeded with grass seed.

About 3,700 feet of wire guards on walk borders were erected along new walks.

The islands and banks in the ducks' aviary were faced with stone to prevent washing down.

The long list of improvements satisfactorily made during the year 1901 is the best commentary upon the relations existing between the Park Department for the Borough of The Bronx and the Zoological Society. Of the funds for ground improvements that have been furnished by the City through the Mayor and the Board of Estimate, the Director believes that every dollar has been expended in such a manner that the public has received its full value in return. Neither time, labor nor quality of work have been sacrificed through unnecessary formalities or delays, and the objects aimed at in improvement work have been achieved by the most direct and business-like methods.

On the opening of the primates' house on December 21 for a private view by the Board of Managers and the Park Commissioners, the Zoological Society, through its Executive Committee, presented to Hon. August Moebus, Park Commissioner for this Borough, a large album of park views, "in appreciation of his constant friendship for, and services in, the development of the New York Zoological Park."

The Society is also greatly indebted to Chief Engineer Martin Schenck and Chief Clerk Gunther K. Ackerman, of the Park Department for Bronx Borough, for their constant and effective co-operation with the Zoological Society in the promotion of Zoological Park construction work and maintenance. Their cordial interest in the Zoological Park has greatly promoted its development, and its daily work as well.

#### *Needs for the Future.*

As previously stated, the fulfillment of the lion house contract will bring the Zoological Park about half way toward completion. It is now vitally necessary that an additional ground improvement fund of \$50,000 be secured at an early date for the erection of other buildings for animals and many other improvements equally necessary. To-day, with but very trifling exceptions, all the animal installations of the

park are filled with animals, and many are crowded. Four new bear dens must be erected with the utmost dispatch, to provide adequately for the thirty bears now on hand.

The need for the antelope house, the ostrich house, eagles' aviary and large bird house are painfully apparent. It is humiliating to be compelled to admit that there are thousands of birds and mammals which we cannot accept, because of the lack of suitable quarters for them. The plans for the antelope house and ostrich house are complete, and if funds were available a contract for their erection could be let within ten days.

There are many improvements, both great and small, which must be undertaken and completed by the time the rapid transit branch to our West Farms entrance is completed and ready for use. Many of these demands are very pressing. For example, immediately following the completion of the lion house about July 1, 1902, the southern half of Baird Court must be planted with shade trees and provided with extensive macadam walks.

The Zoological Society is ready to provide animal collections for new animal installations quite as rapidly as the latter are furnished by the City.

Let us hope that nothing will halt or hinder the steady progress of the Zoological Park and that the end now half secured may, by the close of 1903, be attained in full.

Respectfully submitted,

(Signed) WILLIAM T. HORNADAY, Director of the Zoological Park.

December 27, 1901.

All of which is respectfully submitted.

AUGUST MOEBUS, Commissioner of Parks, Borough of The Bronx.