REPORT OF THE ENGINEER.

To the Honorable Board of Park and Boulevard Commissioners:

GENTLEMEN,—In submitting this report and the accompanying drawings and illustrations, bearing on the establishment of parks and boulevards in Kansas City, I have endeavored to present the subject from the standpoint of design and construction.

An intelligent study of the city's physical conditions will present a complete justification of all the selections made by your Board for parks and parkways within the city, although additional reservation will doubtless be necessary to fully meet the requirements of an increasing population.

The map of the city and its surroundings herewith submitted shows, in a general way, the nature of the topography; the street and transportation lines, and the locations of all the selections for park and boulevard purposes.

The reservations so chosen are identified by letters and are again shown on a large scale in the detail drawings.

These detail drawings contain sketch plans, studies, intended to illustrate and suggest the manner of ultimate improvement of the properties.

The profiles of certain streets and of the boulevards are shown on three separate sheets, which very clearly illustrate the comparative condition of grades. The streets shown are those running north and south between Grand and Cleveland Avenues, and east and west streets between Eighteenth and Thirty-first Streets.

It may be interesting to note that each of the ravines on the South Side can be distinctly traced on these profiles.

The horizontal scale of 1 inch to 1,320 feet, and the vertical scale of 1 inch to 80 feet, intentionally exaggerates the gradients and can not fail to convince even a casual observer of the impossibility, for instance, of using for pleasure-driving any of the east-and-west streets between Eighteenth and Thirty-first Streets.

The profiles, or a reference to the grade elevations marked at each intersection of the boulevard routes, show that these have the lightest grades of the available streets.

Boulevards. The chief objects sought in making this class of improvements are to fix for residence purposes the character of the districts through which the boulevards lead, and to provide pleasant driveways leading from populous centers through proper surroundings to points of especial interest. The boulevard routes selected meet these requirements very fully.
A reference to the general map will show that the three routes, Independence Boulevard, East Boulevard and South Boulevard, lead through some of the best residence sections of the city, and the streets to be occupied are already, in part, improved by fine residences.

All these routes are located on high and sightly ground, and have light grades. These points are of considerable importance in several ways: First. The pleasure of driving is greatly enhanced where no steep hills are encountered. Second. In the necessary improvement of all the routes selected, there will be practically no disturbance of the grades of intersecting streets.

This point is well illustrated on the East Boulevard, and a glance at the profiles of this route will show this. The route lies on the ridge from Eighteenth Street to Twenty-third Street, along Chestnut Street, thence crossing to Kansas Avenue and again on the ridge along Kansas Avenue to Thirty-second Street. Had it been extended further on either side, it would have been on the side-hill, where nearly all cross-streets enter with considerable rise or fall, and, in widening, a readjustment of the grades of cross-streets would have been necessary at every intersection, adding materially to the cost of improvement. Again, since macadam should be used as the paving material, the cost of maintenance will be much less where light grades offer little opportunity for the surface material to wash off.

In accordance with plans approved by yourselves, the width of boulevards at present selected will be 100 feet, and at no time should any less width be considered, since with less width it would be impossible to secure the effect of a parkway and at the same time give sufficient width of roadway. This space should be divided as follows on all routes not occupied by street railways: a central roadway forty feet wide and parking thirty feet on each side; the parked space will be arranged with a curb and gutter combined; next to this, turf seventeen feet wide, then an eight-foot walk, and between this and the property line five feet of turf. On this space three lines of trees almost equally spaced will be planted. A perspective view and cross-section, showing exactly the division intended, is submitted herewith.

On the Independence Boulevard, along Independence Avenue, the cable railway tracks necessitate a somewhat different arrangement. The present width of roadway, fifty-six feet, will be maintained in order to leave a sufficient driveway on either side of the car line.
The parking on each side will be made as shown on the perspective view and cross-section for a street occupied in this manner: from curb to walk six feet of turf; a walk eight feet wide, and eight feet of turf between the walk and property line. On this space only two lines of trees can be advantageously placed.

As to materials and the methods of construction: It is generally conceded that there is no more satisfactory pavement for the purposes of pleasure-driving than a well-built and well-maintained macadam road. Such pavement, if of the best class of construction and material, meets all the requirements even of a very large amount of pleasure-driving. It is almost noiseless, contains no decaying vegetable matter, offers a firm footing for horses and does not jar a vehicle in passing over it. It offers, in addition to its other good qualities, an advantage that has not heretofore been taken into consideration as compared with pavements that are impervious to air and moisture. Since the pleasing effect of a parkway is largely due to its shade trees, arching over roadway and walk, it is obviously necessary that the vigorous growth of the trees be assisted as much as possible, and this can only occur if the roots, in their already artificial surroundings, be given the best possible conditions.

The macadam pavement admits sufficient air and moisture to the roots, half of which are under it, to permit a healthy growth, while materials which form an impervious surface tend to retard the growth, and there is danger, in connection with the many other unfavorable conditions that obtain within cities, that trees will die by suffocation.

The first cost of the best macadam is less than that of any other first-class pavement, and while the cost of its maintenance is a continuous one, its aggregate is no greater than the total cost of other good pavements which periodically require complete renewal.

Macadam pavements in this city should be constructed under specifications similar to those that have been successfully applied in Chicago; thus avoiding all experimental work.

The following specifications will be found satisfactory: On a sub-grade thirteen and one-half inches below the finished grade, when thoroughly compacted by a ten-ton steam roller, and parallel to it, is placed a course of Telford blocks, native limestone, nine inches deep; interstices filled with limestone, not to exceed three inches in their greatest diameter; this course thoroughly compacted by steam roller. (Instead of Telford base, one of crushed limestone compacted in two layers, can be substituted.) On this foundation is placed a four-inch course of crushed granite two and one-half
inches in diameter, the interstices filled with a fine bank gravel, and when well mixed and flooded with water, it is thoroughly rolled with a heavy steam roller. On this course a surface dressing one-half inch deep of granite screenings is placed, flushed and rolled to a perfectly smooth surface.

Such a roadway should be kept moist, but not wet, and, when well cared for, is practically indestructible.

In addition to a curb this pavement requires a gutter, and by using artificial stone (so-called granitoid) the two can be combined, making a uniform finish of pleasing character and perfect alignment throughout the length of roadway. In this, as in all the other work, only the best construction is satisfactory and economical, and this can only be obtained by constant and rigid inspection during the period of construction.

These granitoid gutters will be two feet wide and eight inches deep; the curbs eight inches wide, moulded in position where they are to remain.

The materials used will be three parts fine crushed granite, one part best imported Portland cement; the concrete thus made is placed four and one-half inches thick for gutter, and twelve inches for curb, on a foundation of not less than six inches cinders. Over the whole surface of this gutter and curb a wearing surface one-half inch thick, consisting of one part sand and one part Portland cement, is placed.

The walks will be formed of the same material as the curbs and gutters and used in the same proportions, the base to be on six inches cinders, then concrete of three and one-half inches and a wearing surface of one-half inch, cut into flags of large size. Where this material has been used it has proved much more durable and costs no more than the natural stone.

The trees used on these parkways should be of such kind as experience has proven will serve best. Among these are elm, Carolina poplar, Norway maple, linden, possibly ash and soft maple, and while it would no doubt hasten the time of thorough shading of the streets to use very large trees, it is best to use smaller nursery-grown trees that are much more easily established.

PARKS. In a general way, the park system of a city can be divided into several classes; the great rural or scenic parks, which in this report have not been considered; pleasure-grounds, reasonably large parcels of land within the city, intended to supply convenient places of recreation for a large number of people; play-grounds which provide opportunity for enjoyment of out-door games and
athletic sports; smaller local play-grounds. The latter class provides play-grounds for children and often a resting-place where a tired mother can enjoy a few hours in the open air when neither could go to the large parks.

Of such grounds a city cannot have too many. The improvement of such places is necessarily simple: a convenient border walk of pleasing outline, the plantation of shade trees sufficient to cover a portion of the ground, and possibly screens of hardy shrubs; perhaps small shelter buildings, a convenient sand-PILE for the babies, and abundance of seats.

Of this class four selections have been made: the block between Third and Fourth Streets and Charlotte and Campbell Streets; one block between Eighteenth and Nineteenth and Cherry and Holmes Streets; all of the block west of Central High School, between Oak and Locust and Eleventh and Twelfth Streets, except the site of the business block fronting on Twelfth Street and the site of the Humboldt School. A bird's-eye view of this property is included in the accompanying drawings, and shows the position of the High School and Humboldt School, and a suggestion for arranging the grounds.

The fourth of these selections, "Walnut Grove," is shown in outline on the drawings as reservation (" H"). It is somewhat larger, and sufficient to serve not only for children's play, but can be made a pleasure-ground of considerable beauty. The ground is already well wooded. Its improvement would be simple in form; including walks, arranged to lead through shady groves, and possibly some interesting plantation of flowering shrubs around the borders of the property, and the construction of convenient entrances, and perhaps passages through the ground.

**The Parade.** Next in area, it is intimately connected with the "Paseo," and is situated at the southern end of it, between Fifteenth Street on the north, midway between Seventeenth and Eighteenth Streets on the south, and between Flora and Woodland Avenues. As it is intended chiefly to supply, within easy reach of all parts of the city, a place for general amusement and out-door games, for parades, concerts and public demonstrations, in addition to its use as a local pleasure-ground, its proposed use naturally governs the method of improvement and would require a somewhat different treatment than that of the local pleasure-grounds. The land is admirably adapted for its intended use. It is nearly level; the south half well wooded, and that portion near Fifteenth Street without trees is large enough to furnish a play-ground for many persons. The play-ground portion should be improved with a more or less
dense plantation of trees and shrubs close to the street lines, leaving the whole of the open ground for games. Since a constant use of this part of the ground would probably result in destruction of grass, it may prove best to leave an earth surface over that part most in use, or probably pave with a thin layer of broken stone and screenings.

The wooded portion can be provided with a few walks, leading around and through the grounds, and to such shelter buildings as may prove necessary. The planting of some trees and a greater number of shrubs would add much to the beauty and interest of an already pretty ground.

The Paseo. The parkway shown on the map, along Flora Avenue and Grove Street between Ninth and Seventeenth Streets, forms what may aptly be termed a transition between "boulevard," as applied in these reports, and park. In reality, it becomes from its position a passage (Paseo) from "The Parade" to the entire boulevard system, and, intercepting as it does all the good east-and-west streets in the central portion of the city, it becomes one of the most important and unique features of the whole plan.

Its location in practically the center of the city and its accessibility from all directions would of itself seem to suggest that it should be made a promenade of the highest order, containing improvements such as walks, some trees, shrubs and fountains, and displays of flowers of an extent that would perhaps be unwise in the parks.

The public everywhere shows a thorough appreciation of flowers, and although this is often expressed only in extravagant praise of gaudy carpet bedding monstrosities, there is excellent reason for gratifying a well-defined desire for bright colors. This property readily lends itself to such improvement, that would hardly be justifiable in the larger reservations, where reliance for color effects must be placed in the trees and shrubs with their foliage and flowers, and in hardy herbaceous plants. The educational effect of a tastefully arranged floral display must not be underrated, as such public efforts will quickly find imitators, and result in a more general improvement of private places throughout the city, an indirect result much to be desired.

The whole width of the "Paseo," including the two streets, will be 223 feet north of Twelfth Street, and 242 feet south of that street. The entire width is to be divided into a parking space of thirty feet on each side, with the same division proposed on boulevards—namely, a walk eight feet wide, placed five feet from the
property line, the remainder in grass and planted with three lines of shade trees; outside of this parking there will be on each side a roadway not less than twenty-five feet wide; this will leave a central space 113 and 132 feet in width.

The block between Fourteenth and Fifteenth Streets, on which the Chace School may remain for the time being, should be treated as a local play-ground, without plantations that would interfere with the children’s play. With the exception stated, the central space can be arranged as a succession of flower gardens, with some trees and shrubs, fountains, and perhaps water basins for aquatic plants; but, above all, there should be produced here floral effects on a liberal scale, which would do much to brighten the appearance of the city. A different design in arranging the walks and plantations for each block would produce sufficient variety of scene to give the whole continuing attractiveness.

WEST

In this reservation, extending from Seventh to Seventeenth Streets, and from the summit of the western bluffs to the foot, is included the property lying west of Summit Street between Twelfth and Thirteenth Streets, known as the Mulkey Place, all of which is shown on the bird’s-eye view and the sketch plan of the reservation.

The proposition here becomes a two-fold one; along the Bluff itself, an improvement of great consequence to the whole city, because it will transform an ugly spot at what is practically the entrance of the city into a place at once characteristic and peculiar; and again, in the Mulkey Place a local pleasure-ground of great value, not only because it will be adapted to an improvement for this purpose, but on account of the commanding view obtained here.

The bird’s-eye view submitted illustrates what may ultimately be made of this property, and the features shown there are intended mainly to present to the eye salient points of the Bluff, not a definite plan.

The chief characteristics of the Bluff are the precipitous walls of limestone descending from the summit to a ledge about thirty feet below, which varies in width from thirty to sixty feet. Below this, the stone and shale layers are again exposed to a varying depth of from ten to thirty feet. Beginning at the foot of this precipice is a slope to the foot of the hill, more or less steep, composed principally of a slippery shale and quarry debris.

From Twelfth Street, at the elevation of the ledge mentioned, Lincoln Street descends across the face of the slope to Bluff Street,
below the viaduct of the Ninth Street cable line. In a similar manner, Holly Street descends from Seventeenth Street to the foot of the Bluff at Twelfth Street. Both are, and will remain, important traffic streets, supplying the means of communication between the city on the hills and the West Bottoms, and cannot therefore be eliminated from a plan of improvement. Since they serve only as passages, however, and are not likely to be obstructed by the stopping of vehicles along the sides, there seems little reason for maintaining either at a greater width than perhaps thirty feet for roadway, with a sidewalk of twelve feet to fifteen feet on the outer or west sides.

By a reference to the illustration it will be seen that there are certain points along the summit capable of being formed into places in themselves of great interest, and which, when seen from below, would lend character to the whole picture.

Beginning at the north, such a place is found at Ninth Street. Here the continuation of this street, as represented by the viaduct of the cable railway, descends rapidly to the west, crossing the ledge only slightly above its general level. On the north of this incline, and at the face of the precipice above the ledge, it is possible to introduce a turret of stone, gradually merging into natural wall, and, if balanced by a similar lower one on the opposite side, the whole would impress itself as an entrance into the city, which that point really is. The top of the higher turret could easily be reached by pedestrians from Jefferson Street, and, if arranged with seats and perhaps shelter, would prove one of those fine points of lookout that will make this improvement of great service to the residents above.

On the south side of Ninth Street the reservation lines show the use of a portion of the frontage along Jefferson Street, about midway to Tenth Street. On this property an especially attractive improvement can be made by forming two terraces, or hanging gardens. The upper one a little below the level of Jefferson Street, arranged as a parterre, with perhaps a central fountain surrounded by flowers and walks, the outer sides planted with shrubs and the walls surrounding the three sides covered with clinging vines. A series of stairways might be added, which would supply means of communication between the street above and the second terrace, as well as with the park and the street below.

The second terrace similarly arranged and decorated, the two would become a beautiful feature and make this a most pleasing entrance.
By a stairway from one of the terraces to the summit a promenade can be made leading to another point along the brow of the cliffs at Tenth and Summit Streets, wherein an architectural structure, a broad plaza, could be built, forming a delightful place of gathering, from which scenes below could be enjoyed. This would be especially true in the evening, when the masses of moving and stationary lights lend particular interest to the great West Bottoms.

This plaza, extending along Summit Street from Tenth Street to a point midway between Tenth and Eleventh Streets, could contain at its center a broad stairway leading to the ledge below, giving the residents above easy access to the whole Terrace.

At Fourteenth Street and Bellevue Avenue is another such point, which, treated in a manner similar to that at Tenth Street, furnishes again the opportunity to see the valleys of the Kansas and Missouri Rivers.

Mulkey Place, intended as a pleasure-ground, merges into the Terrace so naturally that it forms a necessary part of the whole, and thus becomes of value in addition to its value as a local park. The fine views obtained from Mulkey Place justify the erection there of a pavilion to give shelter and convenient resting-places to those who will be attracted by the broad outlook.

With convenient paths from entrances on all sides and a liberal use of shrubs and trees, this spot can be made one of the most attractive recreation-grounds within the city.

The ledge that extends from Seventh Street, in a line practically unbroken and on the same general level, to Seventeenth Street will admit the construction of an interesting drive. Going south the cliff rises abruptly to the height of thirty feet on the left, and is almost continuous; on the right is the slope to the Bottoms.

A roadway twenty-five or thirty feet wide can be built with macadam and skirted on the outer side by a walk of granitoid, protected by railings of stone or iron.

At Ninth Street the road would have to be depressed in order to lead under the cable railway viaduct. At this point it would seem necessary to build a stone arch under the viaduct, and, by a plantation of trees and shrubs on either side of the roadway, to screen, in part at least, that somewhat incongruous iron structure.

Passing beyond Ninth Street the ledge widens sufficiently to admit of the arrangement of some walks to the terrace toward Jefferson Street, to connect with the steps at Tenth and Summit Streets. At Twelfth Street the cliff drive would connect with Lincoln Street; then crossing Twelfth Street and follow the ledge,
which is well defined along the entire reservation, to Seventeenth Street; from this point communication is made with the boulevard system by way of Seventeenth Street to the east and on Broadway to the south—if these streets are improved as suggested by the Board.

The surface of the ledge is at present composed principally of a deep layer of shale, which, in the event of planting, will have to be, at least partly, removed and replaced by loam; without this it would be difficult to maintain vegetation.

The face of the cliff seems to reasonably withstand atmospheric action, and, for the present, at least, will not require the construction of retaining-walls, except at such places where the shale layer has been exposed; there, at least, light walls must undoubtedly be built in time, since the exposure to the air disintegrates this material so much that the cliff would be greatly undermined, and would be in danger of partly breaking off. This condition applies to all the stone layers below the ledge; otherwise there is at no point any indication of instability of the ledge.

At least for the summer season, a cheap and fairly satisfactory improvement can be made along the entire cliff by planting a profusion of clinging vines, such as different varieties of Ampelopsis.

Below the ledge and throughout the length of the terrace the ground will be somewhat difficult to treat. The greater portion of it is composed of quarry debris, containing also a large quantity of shale, all thoroughly saturated with water, and consequently very slippery and hard to hold. At such portions of the terrace where slopes are very steep it will probably be necessary to expose the face of the rock layers below the ledge to such an extent as will bring the slopes below more nearly to an angle of the natural point of rest. This could also be brought about by building a comparatively high footing-wall along the bottom of the slope; and, of course, any treatment of this property must include a thorough system of drainage in the earth, and particularly back of any walls that may be built. Except where absolutely necessary in order to furnish communication between the upper and lower portions, there should be no paths.

The slope should be turfed and in part covered by a judicious planting of trees and shrubs. It would be difficult to establish a great variety of vegetation on this property, inasmuch as it is exposed to very large quantities of soot and gases emitted from the locomotives in the railway yards below. Again, during the summer, the exposure to the western sun produces great heat and dry atmos-
sphere, and in the winter time the alternate freezing and thawing will be detrimental to a very large class of plants.

**North Terrace.** The selection of the property shown on drawings as "North Terrace," will undoubtedly supply one of the most useful and beautiful parks within the city. The reservation includes all the property within the boundaries shown on the detail drawings. It is naturally divided into two great sections, east and west, by the great ravine occupied by Agnes Avenue. Both sections contain property characteristic of the Bluff, with its beautiful views, and also sufficient of fairly level surface for play-grounds.

The western section includes the five acres in Pendleton Heights now owned by the city. Along the north slope is the ledge which forms part of a cliff drive that will make this park famous for its beauty and variety of scenery. The summit above the cliff furnishes opportunity for most extensive views both along the Missouri River valley to the north, and to some extent of the city to the south. Here opportunity should be afforded, by convenient but separate drives and walks, to reach the highest points, where suitable resting-places, in form of concourse for vehicles and shelter buildings for pedestrians, can be constructed. The high promontory at the western end of the reservation should be used as one of these points; another lies between Wabash and Prospect Avenues. By a judicious planting of shrubs and trees screening portions of the valley below, and forming in some places vistas through frames of foliage, a great diversity of scene can be produced.

South of the western promontory, and between it and St. John Avenue, lies a pretty dell, capable of being formed into an attractive feature of the park, with a small pool, sufficient to furnish room for boating in summer and good skating in winter. Dora Avenue, which now leads through this dell from the East Bottoms, can be narrowed and slightly changed in location; it will then make a good park roadway and will give the residents below easy access to the park. From St. John Avenue at Brooklyn Avenue, a roadway curving to the northwest and crossing Dora Avenue roadway near the western boundary of the reservation will supply direct connection between the residence district around the western promontory to the cliff drive.

As shown on the sketch plan, but few roads or paths are needed in the reservation; they should be constructed only where absolutely necessary to furnish convenient communication between different points of interest, or passages to the entrances.
That portion east of Olive Street and lying on the higher open ground is admirably adapted for a play-ground and should be treated as an open lawn, with some shade-trees along the borders and occasional shrubs to break the bare surface of the lawn. Owing to the street grades through some of this property, some grading will be necessary in order to avoid abrupt breaks. At the head of Prospect Avenue, and at the eastern portion of this section, is a narrow ridge running out toward and overlooking the Agnes Avenue ravine. This ridge is shown on the drawing as “Prospect Point.” Here a lookout is obtained that suggests the erection of a turret of moderate size, sufficient to provide seats and shelter for those who will undoubtedly enjoy the romantic surroundings. Stone construction would seem in keeping with the cliffs and rock exposed in the numerous quarries. Across the ravine, at “Scarritt Point,” the eye rests on a beautiful and well-wooded slope which terminates at the cliff. Below this is the cliff drive that will wind its way around the brow of the cliff through the “Wilderness” of groves and tangle of native shrubs to the Independence Boulevard above. Lower down is the slope to the bottom of the ravine at Agnes Avenue, and there other quarries expose rock, which should be covered with masses of vines. The present condition of the property at both “Points” is illustrated in the views presented herewith.

From the lookout at “Prospect Point,” walks, and perhaps stairways cut into the rocks, should lead to the ledge and cliff drive below, and to the stone viaduct across Agnes Avenue that will lead to the cliff at “Scarritt Point.”

From “Scarritt Point” the cliff drive is continuous throughout the length of the park and Independence Boulevard. With the latter connections on easy grades can be made at several points.

Some of the views that accompany this report are taken from the cliff drive. In addition to the drive, a bridle-road can be built along the slope below, greatly enhancing the value of the park for equestrians. The northern exposure of the park, protected as it is from the heat of the summer sun, results in a luxuriant growth of vegetation on the cliffs, and it will be possible to produce a far greater profusion of plants here than will be possible, for many years, on the “West Terrace.”

Aside from the many beautiful views obtained along the eastern section of the “North Terrace,” this reservation possesses a number of places with fairly level surface that will make handsome play-grounds. The most prominent of these are the “Scarritt Point,” with its gentle and shady slopes, and quite a large area north of
Independence Boulevard and immediately west of what is known as "Burge Park."

The "Wilderness" of native trees and bushes, the property lying north of St. John Avenue and west of Walroad Avenue, is also an excellent play-ground. Its variety of contour in gentle and steeper slopes will permit the construction of a series of paths that would lead through shady groves and open into broad vistas of great interest. This portion of the park is bounded on the south and east by Independence Boulevard, which forms at its intersections with St. John and Walroad Avenues a wide concourse where many vehicles will have room to stand, permitting their occupants to enjoy a view of rare beauty to the northwest, over the "Wilderness" in the foreground, and between "Prospect" and "Scarritt Points," to the river and valley below. At this point the line of the boulevard crosses the head of a deep ravine, necessitating a considerable earth-fill, and this in turn will require a high wall of several hundred feet in length. By building a wall of rough-faced rock, and partly covering it with vines, it can be made an attractive feature entirely in harmony with its park surroundings. By a liberal provision of seats placed perhaps in recesses in the wall on the level of the boulevard, this point can be made of great value to pedestrians.

From Cleveland Avenue east, Independence Boulevard skirts the park throughout its length, making it accessible at many points.

Throughout the park there is an excellent growth of native trees and shrubs, and it will require comparatively little additional planting to make the whole a handsome park. Along the north line of Independence Boulevard at the edge of the Bluff it will be desirable to make some plantations of shrubs in order to screen from view some of the present and possibly future factory buildings in the immediate foreground in the East Bottoms below.

Penn Valley. Like the other large park reservations, the property included in this seems intended by nature for park purposes. On the south is high land far above all the surrounding streets, and to the north the deep valley.

The Penn Street road, which bounds the property on the east and has easy grades throughout, should be made the park road.

By avoiding the use of continuous and formal plantation of shade trees along the road, using instead groups of trees, the valley will become what it really is intended to be, a park drive; from it several roads will lead into and through the park beyond, making all portions easily reached, and from all sides. The extensive val-
ley in the northern half of the park will require but little improvement beyond partly leveling the lower ground for a general playground, giving place for nearly all the out-door games. The whole of this property, when well turfed and planted with clumps of trees and shrubs along the slopes, will become a most delightful place of recreation. On the east side of the valley and within the park is a cliff and ledge similar in character to those along the "West" and "North Terraces," and here also a short cliff drive will add much to the interest and usefulness of the property. Above it, between the cliff and Jefferson Street, the western boundary, is high land. Along this summit a path would lead to all the points from which the best views to the west, north and east can be obtained. At these places seats and shelter will be desirable.

The south half of the park is, in character and topography, the opposite of the north portion. It is in the main a high, sightly plateau, beginning near Thirty-first Street, where a promontory is formed by two small ravines that drain the eastern and western sides of the park, and that converge in the valley below.

On a level slightly below the plateau, a driveway leading from the east at Thirty-first Street around the promontory to Thirty-first Street and receiving into it the cliff drive from the north would supply communication between the residence districts on each side and connect with all drives and paths into the interior of the proposed park. The high point of the promontory, which commands a fine view of the densely populated hills of the city to the north, is an excellent site for a pavilion. A small lake now on the property could be enlarged, and, with paths to and around it, would add much to the beauty of the park.

A main driveway can be arranged to enter near the center of the southern boundary, really continuing the South Boulevard, and pass through the park toward the city, connecting in the park with its roads and paths.

In the three larger reservations, to a less degree in the "Penn Valley," however, there exists the condition that, aside from the areas of pleasure-ground provided, the principal and most attractive feature lies in the wide range of views obtained from summits in the reservations. This fact at once controls the designs for location and the direction of the greater portion of roadways and paths that lead to points of vantage, so that every view will be seen at its best, and that each will awaken interest and expectation as to the next to follow.
In some cases great breadth of views is not an unmixed advantage, as they often include spots and objects not in harmony with park scenery which the designer would like to screen from view. To accomplish this, plantations of trees and shrubs can be disposed in the immediate foreground to cover undesirable objects and to form frames of foliage for the pictures left exposed to view. These plantations can often be so arranged as to appear to incorporate distant objects of interest and make them seem portions of the park, although actually far beyond and out of control.

The construction of roadways and paths need not in any case be costly. They should require very little grading, as they will in all cases adhere as closely to the natural surface as the shape of the ground and condition of surface-drainage will permit. There is no apparent need for drainage except such that will care for surface water. The roadways, built on a base of eight inches broken stone covered with gravel, will bear all the driving that can go upon them, and the paths will probably not need more than four inches of stone and gravel. Both will, in most cases, require gutters of permanent material (small cobble-stones seem best), as they form the natural surface drains. As these can not be large enough to carry great quantities of water, sometimes for long distances to natural outlets, underground drains will in some instances be needed.

A sufficient number of buildings for operating purposes as well as for convenience and comfort of the public must be provided for at convenient and proper places.

As all such structures, however, are artificial and more or less out of keeping with natural scenery, they should, therefore, never be permitted to become conspicuous either in design or color.

The climate here permits the use of a great variety of deciduous trees and shrubs and herbaceous plants, making it possible to have during the spring and autumn months a great profusion of flowers, without resorting to an excess of bedding plants for color effects. In autumn foliage we are not so fortunate, as there are only a few trees that produce clear colors, and then for a very short time only. The dry summer months seem to limit the use of coniferous trees to a comparatively small number of kinds, but among these are the most valuable of the pines, firs, spruces, and arbor-vites for park planting.

For the lawn, the light of the landscape picture, the blue-grass (Poa pratensis) is unquestionably the best. It seems able to bear continual trampling and will make it possible to permit almost unrestricted public use of the lawns.
Before any park improvement is possible, it is indispensable that a nursery or nurseries for trees and shrubs be provided.

It will be impossible to do satisfactory work without nurseries under direct control of the Park Board.

Geo. E. Kessler,

Engineer.