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THE SANITARY TOPOGRAPHY

OF

NEW-YORK CITY.

By S. A. RABORG, M.D.

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By S. A. RABORG, M.D.

The rapid growth of New York City is at present exciting universal interest throughout the country; and as a place of residence, or in a business point of view, it would be difficult to overestimate the vast advantages it possesses. Nature has lavished upon the island its choicest gifts; surrounded on one side by the East and Harlem rivers, on the other by the beautiful Hudson, the "Rhine of America," as an entirety, its advantages for natural drainage and general healthfulness cannot be surpassed. But eighteen miles from the Atlantic Ocean, with an admirable harbor, the nations of the earth already vie with each other in pouring into the lap of this infant giant their most costly productions and most beautiful works of art. It is now the most populous city and the greatest commercial emporium of the western hemisphere, and stands with its youthful vigor a proud rival of the largest cities of the old world. With the vast undeveloped wealth of free America, and the energy and ambition of her sturdy sons to press it forward, is it not easy to foreshadow the prospective importance of this metropolis of the Union?

But one subject of uneasiness presents itself in this glance at the future, and that is the rather limited space which nature's barriers have allowed us, and which threatens eventually to stop the progress of the city. "Manhattan Island is but thirteen and one half miles long, and has an average width of one and three fifths miles. This gives an area of twenty-two square miles, or fourteen ~~hundred~~ thousand acres."*

We may consider the city as pretty solidly built up as far north as Fifty-ninth street, the border of Central Park. The census of next year will probably show the population to number between thirteen and fourteen hundred thousand souls; and the rate of increase is estimated to be between six and seven per cent per annum. Thus the population of the island in 1880 will number far above two millions, and the city be extended as far northward as Ninetieth street. There are but "37,244 lots of full size, that is, twenty-five by one hundred feet, between Eighty-sixth and One Hundred and Fifty-fifth street."† This shows conclusively that before many more such decades of years roll round, every available

* *Encyclopedia.*

† New York *World*, February 15th, 1868.

portion of the island will be built upon, and our further expansion apparently prevented. But this, we hope, will be obviated by the erection of the East River bridge, and other modes of rapid transit to our sister city, Brooklyn, and the Jersey shore; thus enabling us to bring within our limits all the territory that will be required.

For the present, the rapidly increasing number of our commercial houses and the consequent greed for space shown by trade in the lower part of the city, as well as our constantly augmenting population, show conclusively that the better class of residents now occupying locations south of Thirty-fourth street will be obliged to look elsewhere for homes. That this is to be the case no one can doubt, who has studied the progress of business marts in their up-town march, during the last two years. The invasion of Union Square, the magnificent buildings on Broadway between Eighteenth and Nineteenth streets, the "Grand Hotel," and, more than all else, the appropriation of the lower end of Fifth Avenue for public galleries, attest this fact, and warn us that no prominent location below Thirty-fourth street will, in a short time, be safe from the all-powerful grasp of this insatiable demand. With this fact before us, the question arises, What portion of the island offers the greatest prospective permanency for private residences, and at the same time the best inducements for the happiness and physical well-being of the people?

That tract of the island bounded on the south by Thirty-fourth street, on the east by Lexington avenue, on the west by Sixth avenue, and on the north by Fifty-seventh street, is undoubtedly very desirable property; but with our rapid growth it is impossible to tell what it will be twenty years hence; and besides, we are lured past this portion by the many advantages offered by the section north of it.

We have now before us the Central Park, extending from Fifth Avenue on the east, to Eighth avenue on the west; and stretching out in picturesque beauty from Fifty-ninth to One Hundred and Tenth street. To the east and west of this, we find topographically a very different character of country. On the east side from Fifty-ninth to Ninetieth street, the surface is very uneven; in some parts ledges of rock run up one hundred and twenty feet above tide-water, and then abruptly descend into valleys almost on a level with tide-water; and here are found the beds of old streams, so many of which formerly rolled their sluggish waters through this portion of the island into the East River. The general fall is eastward, though not sufficiently so to make natural drainage into the river good. From Ninetieth street to the Harlem River, we have a perfectly flat plain; unbroken, with the exception of Mount Morris Square, by any marked elevation. The land lies but little above tide-water, and presents every appearance of being to a great extent "made ground." This supposition is further strengthened by the alluvial character of the soil. Many suppose that a branch of the Hudson once flowed across the island at Manhattanville to Hell Gate; but we believe that originally the upper portion of Manhattan was a distinct island, and have no doubt the waters of the Hudson washed freely between the two, and in time the amount of soil gradually deposited on either bank limited and eventually closed the gap, thus giving us our present formation.

On the west side of the park we have a very different topography.

"From Fifty-ninth to One Hundred and Fourth street, the Eighth avenue is nearly the central ridge of the Island. Its average height is twenty to thirty feet above the Fifth avenue. At Fifty-ninth street, the elevation of the Eighth avenue above the tide-level is seventy-six feet four inches, increasing to ninety feet at Seventieth street, reaching one hundred and twenty feet at Eighty-fifth street and one hundred and twenty-two feet at Ninety-second street; descending, it is eighty-nine feet at One Hundred and Fourth street, and gradually falls off to the general low level of Harlem plains.

"At One Hundred and Sixth street, the ridge extends north-westwardly, leaving the Eighth avenue, running nearly along the Ninth avenue to One Hundred and Twentieth street; then bending westwardly, and forming the southern hill-side of the Manhattan valley to the Hudson River. The new grade of the Eighth avenue already established, by keeping up elevations and filling depressions, will gradually ascend to and then descend from its summit at Ninety-second street, and make the finest possible grade for any avenue on the island." *

To appreciate, one must see the romantic beauty presented by the bold bluff of rocky formation against which the crystal waters of the Hudson dash in ceaseless waves and eddies. At points forming ascents from seventy to one hundred and forty feet above tide-water, it stretches away, with varying elevation and constantly changing scenery until it reaches Manhattanville. There, as if to make space to cradle the village in its rocky embrace, for a few blocks it disappears, only to rise in more stately proportions beyond, forming its crowning glory of landscape grandeur at Washington Heights.

"There is a high table-land between the Eighth and Ninth avenue ridge on the east, and the Hudson River bank on the west. The surface of this table-land is broken; it has high rocky ridges and mounds in central locations reaching these elevations. At

Ninth avenue and Sixty-sixth street..... 89 feet.
Ninth avenue and Seventieth street..... 98 "
Ninth avenue and Eighty-fourth street.....120 feet.
Ninth avenue and Ninety-first street.....121 "
Ninth avenue and One Hundred and Fifth street.....117 "
Tenth avenue and Seventy-seventh street.... 98 "
Tenth avenue and Eighty-fifth street.....109 "
Tenth avenue and Ninety-Second street.....107 "
Tenth avenue and One Hundred and Fifth street.....109 "
Tenth avenue and One Hundred and Seventeenth street.....145 "

"Between these elevations, which (except a central ridge or terrace between the Ninth and Tenth avenues from Seventy-ninth to Ninety-fourth street) are not generally continuous, are numerous hollows and valleys, the lowest having an elevation of fifty to sixty feet above the tide-level. The average elevation of this plateau is as much as seventy-five feet; in the more northerly portion, as much as one hundred feet. The surface drainage from this plateau finds its way to the river, through the valleys above indicated, at Sixty-seventh, Eightieth, and Ninety-sixth streets." *

With a view to the prospective physical health of the city, the authorities should do every thing possible to destroy the extensively prevailing malaria found in it, which emanates from the large tract of made ground along the East River, and from the beds of the original streams, which covered acres of land in the primitive state of the island. Few people fully comprehend the insidiousness of this poison which affects the system in such a variety of ways and shows such erratic developments that at times the skill of the physican is baffled in attempting to detect its presence. It is rendered more permanent in many locations by the miserable condition of the sewers, and, where these have not been built, by the irregular grading of streets forming obstructions to the natural drainage of the soil. Again, in many places where sewers have been provided, as along the course of Seventy-fourth street between Third and Fifth avenues, they do not seem to entirely prevent the generation of the poison, as intermittent and remittent

* New York *World*, February 15th, 1868.

* New York *World*, February 15th, 1868.

fevers are still rife in the surrounding districts: not properly filling up the beds of the streams in many of these cases may, however, account for this.

Owing to its rocky formation, malaria has found a home in but few locations in the north-western section of the city; and if these are examined, they will generally be found to be lots which, by the grading of the streets, have been made lower than the side-walks. When these are properly filled, the deleterious influence they exert will disappear. In addition to this, the level of this section is so much above tide-water that it possesses every advantage for natural, and, when that does not prove sufficient, every facility for promoting artificial, drainage.

According to the report of the Board of Central Park Commissioners for last year, "the prevailing winds for the year were west and north-west." Let us see what comparative difference this makes to the two sections of the city under consideration. The west side receives this wind in all its bracing freshness directly after it has passed over the Jersey highlands, on the opposite side of the Hudson. It carries before it all the exhalations from this side toward the east, and imparts a healthful vigor to all who come within its influence. The east side, being so much below the level of the west, receives but little of the benefit to be derived from this wind. Again:

"When the mercury in the barometer rises, the smoke and injurious emanations are quickly dispelled in the air. When the mercury lowers, we see the smoke and noxious vapors remain in the apartments and near the surface of the earth. Now, every one knows that, of all winds, that from the east causes the mercury in the barometer to rise the highest, and that which lowers it most is from the west. When the latter blows, it carries with it all the deleterious gases it meets in its course from the west. The result is, that the inhabitants of the eastern parts of a city not only have their own smoke and miasmas, but also those of the western parts brought by the west wind. When, on the contrary, the east wind blows, it purifies the air by causing the injurious emanations to rise, so that they cannot be thrown back upon the west. It is evident, then, that the inhabitants of the western parts receive pure air from whatever part of the horizon it comes. We will add, that the west wind is most prevalent, and the west end receives it all fresh from the country.

"From the foregoing facts, M. Junod lays down the following directions: First, persons who are free to choose, especially those of delicate health, should reside in the western part of a city. Secondly, for the same reason, all the establishments that send forth vapors or injurious gases should be in the eastern part. Thirdly and finally, in erecting a house in the city, and even in the country, the kitchen should be on the eastern side, as well as all the out-houses from which unhealthy emanations might spread into the apartments."*

The absence of foliage is a great disadvantage in malarious districts, and here the east side of the city enjoys a marked superiority over the west in the ample and rich character of its soil, which, with proper cultivation would produce trees of luxurious foliage. On account of the small quantity and the poor quality of the soil in many locations in the north-western section of the island, trees are not as numerous as they should be; but it becomes only a greater duty to foster those we have, and to constantly increase their number by planting others in every desirable location. Too little regard has in all ages been paid to that beautiful harmony established by the wisdom of God in nature, and but few persons consider how essential the vegetable kingdom is to animal life. With each inspiration of air which we draw into our lungs to obtain oxygen, a certain amount of blood is purified, and throws off its carbon.

* "Influence of Locality on Duration of Life." CATHOLIC WORLD, April, 1869.

This carbon is rapidly absorbed by plants, and nurtures them; and in return they liberate the oxygen which is absolutely necessary for our being.

"Plants absorb their food entirely in a liquid or gaseous form, by imbibition, according to the law of *endosmosis*, through the walls of the cells that form the surface; as when liquids of unequal density are separated by a permeable membrane, the lighter liquid or the weaker solution will flow into the stronger with a force proportionate to the difference in density; but at the same time a smaller portion of the denser liquid will flow out into the weaker, which process is called *exosmosis*. The fluid absorbed by the roots is thus carried from cell to cell, rising principally in the wood, and is attracted to the leaves, or other parts of the plants exposed to the sun and light, by the exhalation which takes place from them, and the consequent inspiration of the sap. Here the crude sap is exposed to sun and light, and assimilated and converted into organizable matter." *

Man, in his ruthless desire to utilize, according to his weak appreciation, every thing placed within his power, destroys the very breastworks against disease and death with which the foresight of the Creator has surrounded him. Many instances are recorded where the removal of a grove of trees has rendered entire villages for ever afterward a prey to the innumerable miseries produced by malarial poison. This fact has been recognized from the earliest days, and demonstrated so clearly by experience, that the more intelligent inhabitants of rural districts, where marshes abound, build their homes so that winds passing over them, and consequently laden with their pestilential exhalations, shall be intercepted by some belt of forest-trees. Many parts of Italy would be uninhabitable without the protection of its luxurious vegetable productions, and it is well known that the citizens of Rome are thus shielded from the south-west wind passing over the dreaded Pontine marshes. The salutary influence of foliage is not felt in the case of malaria alone; observers have noticed the comparative immunity from epidemic diseases also enjoyed by those whose homes are thus protected. During the prevalence of cholera in Burlington, Iowa, in 1850, this was strikingly demonstrated.

"In the houses on the west side of Main street, north of Court, more deaths took place than in any other portion of the city; and more occurred, in proportion to the number of inmates, in every other house than in the one in front of which were trees, and, what is still more convincing, the natural predisposition to cholera existed to a greater extent among the inmates of this house, than in any other. Another and more striking instance occurred in the two houses nearest the 'old saw-mill.' The house adjoining the mill was surrounded by trees, and not one of the occupants suffered from cholera; while, in the other house, which was exposed, and stood upon the bank of the Mississippi, three deaths took place; and what is more to the point, the family which escaped were new-comers, and suffering from *nostalgia*, and the effects of a change of climate, which act as a predisposing and exciting cause of the disease; while those who lived in the other house were old residents, and had been thoroughly acclimated. Dr. Buckler notices similar facts in his account of the cholera, as it appeared in the Baltimore Alms-house, in 1849." *

Trees are useful to us in another respect; they moderate temperature. In winter, the heat of the earth is constantly ascending their trunks to be given to the air. It is well known that large forests decidedly lessen the intense cold, and, in summer, moderate the extreme heat, by the great amount of moisture which they exhale from their leaves. Again, who has not felt the happy influence a forest has upon the mind? How our petty troubles melt away, and our hearts expand with grateful homage, when we listen to the tuneful harmony

* *Public Parks.* John H. Rauch, M.D., of Chicago.

* *Public Parks.* John H. Rauch, M.D.

of æolian sweetness, as the feathered songsters of the grove, and the passing breezes rustling through the verdant foliage unite to form nature's orchestra, wafting upward one grand strain of praise to the Deity. And when, in the autumn of our lives, borne down by blighted hopes and ruined ambition, we seek the forest's solitude, every fitful breeze sounds a low wail of sympathy, falling in gentle cadence on the crushed heart.

The young growth of the trees is particularly noticeable in Central Park, and in this respect it will be many years before we can rival Druid Hill Park near Baltimore, where the grand old trees, raising their majestic heads toward heaven, seem whispering to every passing zephyr hymns of adoration. Here, art may carve meandering roads, span the crystal streams with elaborate bridges, erect statues in honor of man, decorate and adorn to suit the taste of the most fastidious; but high above all these, the majestic oaks wave their luxuriant foliage, and assert the superiority of the works of the Creator over the imitations of the creature. Thus it needs but a moment's consideration to see what a material advantage to our comfort, physical well-being, and happiness trees are; and to understand why our broad avenues should be bordered with them, and their growth fostered as much as possible in our parks; and we may rest assured that succeeding generations will bless us for the forethought which will add so much to the beauty and healthfulness of our metropolis.

The eastern portion of all large cities is devoted to manufacturing purposes, and New York presents no exception to this almost universal rule. By reason of the comparatively level and easily graded character of the east side, buildings were rapidly erected along the line of the Second, Third, and Fourth avenues; and the suburban villages of Harlem and Yorkville have been most remunerative to property-holders on that side of the park. The easy access to the points above named by the city railroads has drawn that kind of capital which invests in good substantial tenant-houses. These pay sufficiently well to prevent their being demolished, even with a prospect of better pecuniary results from a higher class of property; and thus are always an obstacle in the way of first-class improvements in a neighborhood.

The east side possesses a great many advantages which will in time increase its commerce, and render its entire river-side most valuable. Already numbers of manufactories, lumber-yards, and other business places occupy nearly the entire water-front as high as Fiftieth street; and the easy approach to, and gentle slope of its bank offering great facility for landing merchandise, will rapidly increase their number toward the northern extremity of the island. Again, should the attempt to relieve Hell Gate of its dangerous rocks be successful, a new era of prosperity will dawn for the East River shore, and every foot of its extent at once receive increased valuation. Piers will spring into existence, and vessels of every description bearing the precious wares of every clime, will seek this hitherto inhospitable channel, and thus lessen their tedious voyage by at least two hundred miles.

North of Fifty-ninth street on the west side, with the exception of the squatter's shanty, removable at a few days' legal notice, there is nothing to impede the numerous and beautiful improvements designed by the Central Park Commissioners, to whose judgment this work is intrusted. These improvements consist in laying

out parks and public drives, and in adding in every possible way to the natural advantages of this section. First, at the intersection of Broadway, Eighth avenue, and Fifty-ninth street we will have the Circle, with a radius of two hundred and sixteen feet. This will provide at once an opening to the grand Boulevard, and also add to the beauty of the entrance at this point to Central Park. The ground around this circle will undoubtedly present one of the finest positions in the city for public buildings, and will become as valuable for this purpose as that in the neighborhood of Union Square. In this connection we would express a hope that the commissioners will reconsider the great mistake they have made in closing Sixtieth street between Eighth avenue and the Boulevard, thereby cutting off the view of the park and its grand entrance from the residents of that street. It would add much to the finish of the circle, and the beauty of the approach to the park, if Fifty-ninth street retained to either river the width it has between Fifth and Eighth avenues. Eventually a ferry will be established at either extremity of this street, for the accommodation of persons desiring to visit the park; and this with other circumstances, combines to make it very desirable that it should be one of the wide streets. Several efforts have been made to have the Belt Railroad running on this street removed to Fifty-eighth street, but so far without success. As this change is desired by the property-owners and residents in the neighborhood of the park, it is hoped it will be effected by the Legislature during their session this winter.

From the north-western portion of the circle issues the boulevard mentioned above. This will be in reality the extension of Broadway, and is designed to be one hundred and fifty feet wide, with twenty-two feet of its central portion reserved for a grass-plot, to be bordered on either side with shade-trees. It will extend along the line of the old Broadway road "crossing Ninth avenue at Sixty-fifth street and Tenth avenue at Seventy-second street, and then passing about midway between the Tenth and Eleventh avenues to One Hundred and Fourth street, where it bends to the westward, following the line of the Bloomingdale road, and strikes the Eleventh avenue at One Hundred and Seventh street, and then follows the Eleventh avenue to One Hundred and Fifty-fifth street. Beyond One Hundred and Fifty-fifth street it continues as a part of the improvements of the Fort Washington district, which are now being carried out by the commissioners under the law of 1865,"* framed for this purpose.

Then we have the Zoölogical Garden, which is considered a portion of Central Park, and which is to occupy the space bounded by Seventy-seventh street on the south, Ninth avenue on the west, Eighty-first street on the north, and Eighth avenue on the east. It should properly be extended, taking in the same blocks from Seventy-seventh to Eighty-first street, as an arm of the park, and crossing the intervening avenues and boulevard by arched bridges, to the Riverside Park, which skirts the Hudson. This last will be one of the most beautiful improvements on the island. Commencing at Seventy-second street, with the rocky highland, it continues along the bank of the Hudson as far north as One Hundred and Thirtieth street. It will be bounded on the east by the new River-bank avenue, which runs along the crest of the highland, and is to be

* New York *World*, February 15th, 1868.

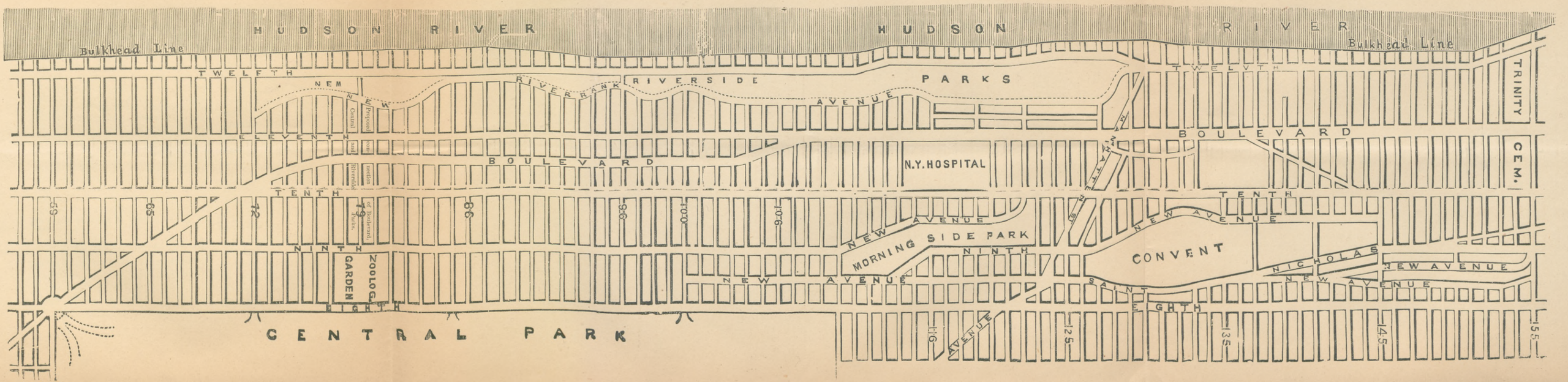
one hundred feet wide, and on the west by Twelfth avenue. It is difficult to imagine a more charming variety of scenery than this park must present from its many prominent points. A continuous view of the Hudson for miles will be seen, with the bold highlands of New Jersey on the opposite shore, and the limpid waters of the river adding variety to the charming landscape. Turning toward the north, Fort Washington looms up in grand proportions against the distant horizon, covered with rich foliage, and studded here and there with princely mansions. Glancing eastward, the park, with its charming intermingling of natural and artificial beauty, stretches away toward the East River in endless variety of lawn, shrubbery, and pebbly pathway; while to the south a grand panoramic view of the island city is presented, with its myriad towers and steeples of public buildings and of churches, all attesting the prosperity and wealth of the people. We hope the Park Commissioners will consider the extension we have above suggested. If made now, its expense would be light in comparison with the increased value of the property bordering the proposed connections; while the combination of the two parks, the boulevard, and the Zoölogical Garden would form a succession of grand pleasure-grounds such as no city of the world can now boast of.

We have still to mention Morningside Park, which is to commence at One Hundred and Tenth street, and extend as far north as One Hundred and Twenty-third street. It will be somewhat irregular in form and its southern portion will be bounded on either side by one of the new avenues, and the northern extremity by Ninth and Tenth avenues. It is most fortunate that the original intention of cutting down the grade of the streets in this section has been changed, and the matter left to the option of the Central Park Commissioners. We may rest assured that excellent taste will harmonize their improvements, and every notable point be reserved for some artistic design, and thus no natural advantage be destroyed which would add to the beautiful symmetry of the whole.

During the progress of these vast improvements a permanent system of sewerage should be devised for the comfort and convenience of the inhabitants of this district. At present this could be readily effected, as in many parts of the boulevard, Eighth avenue, and side streets, the grade will have to be raised several feet above the present level. This is particularly noticeable in the boulevard in the neighborhood of Eighty-fourth street, where the old Broadway road must lie twenty feet below the grade of the grand drive. It should also be a question as to the kind of sewer to be adopted. We are convinced that throwing away the contents of our sewers is an irreparable error, as all the *débris* passing through them should be used as a fertilizing agent. Throughout the country, but more particularly in the South, is the reckless abuse of the soil noticeable. Our farmers sow and reap their crops year after year until the earth is worn out, and loses its productive power; then they seek new fields. Our territory is so vast, that the effect of this wretched mode of farming has not as yet been felt; but it must be, sooner or later. In many parts of Europe, the same ruinous policy has been pursued, and now the inhabitants are obliged to import guano to sufficiently revivify their impoverished land to raise even the lightest crop. We are happy to see that some of our public men have had their attention drawn to this fact. Senator Sprague in a

DIAGRAM OF THE WEST SIDE, AS AGREED ON BY THE CENTRAL PARK COMMISSIONERS.

FROM "THE WORLD" OF FEBRUARY 15th, 1868.



recent conversation said, "We are rapidly exhausting our virgin soil, without furnishing it the means of recovery in the shape of fertilizers, and extending our railroads to new tracts as fast as we wear out the old cultivated ones." If we could deodorize the material from our sewers, and put it to practical uses, we would be gainers in many ways. In the first place, our piers would be relieved of the enormous quantity of decomposing matter which may constantly be seen festering under the sun's rays, and emitting pestilential exhalations; and secondly, a vast amount of valuable fertilizing material would be garnered from this large city, which would go far toward enriching the lands around us; and we may add that this experiment has been tried, and proved not only a success, but also highly remunerative.

"Sewerage has been advantageously deodorized and applied to agricultural uses in localities in England, where it could not be conveniently discharged into the sea, by the process of Mr. W. Higgs, of Westminster, which consists in collecting it in large tanks and admitting with it a stream of lime-water, the effect of which is to cause the precipitation of the organic matter with the phosphates, urates, sulphates, etc., and the expulsion of any free ammonia. Through the cover of the tanks the ammonia and all gaseous matters are conveyed by a pipe into a convoluted chamber, where they are fixed by various chemical reagents, and preserved. The tanks, when full, are allowed to remain undisturbed for an hour, when the liquids are drawn off clear and without odor. The pulpy sediments are then collected and dried, and rendered fit for the market. The expense of the process was rated at £1 per ton, and the manure thus prepared was sold at Cardiff for £3 per ton." *

It is an unquestionable fact that through the sewers of cities enormous quantities of the constituents of plants are conveyed into the sea, and unless saved and restored to the soil, the loss must be made up from other sources, or the lands become impoverished. From the London sewers, refuse matter is thrown into the river Thames; and so fearfully does this immense body of filth pollute its waters that it has been found necessary during warm weather to neutralize the impurity and destroy the foul gases by throwing large quantities of disinfectants into the river, costing the city as much as "£20,000 in the summer of 1859." They are now constructing an addition to their sewers which will carry their contents along the course of the river eight miles to Barking, into a reservoir a mile and a half long, and about one hundred feet wide by twenty-one feet deep. From this reservoir it will be, at high-tide, discharged, through numerous large pipes, into the middle and bottom of the river, at the depth of sixty feet below the surface. "The estimated cost of this vast work is about £4,000,000, and the time fixed for its completion five years."*

As the river Seine divides the city of Paris into two parts, so it divides the sewers into two districts, which formerly emptied their contents respectively on the right and left bank of the river. In order to prevent the infection of the water of the river, the main sewer of the left bank was made to pass its contents through a tunnel under the river, and empty them at Asnières, the same point where that of the right bank emptied, thus avoiding the current which washed the discharged material back upon the city.

Thus we see that the disposition of sewerage has always been a question of great import, even to cities situated on large streams of water, into which it could be turned. While proposing a system for at once doing

* *New American Cyclopædia.*

* *New American Cyclopædia.*

away with the nuisance caused by it, and at the same time utilizing it for fertilizing purposes, we are happy to add that it is not the first time the plan has been brought forward for New York. Professor Lewis A. Sayre during his administration as Resident Physician of this city, had regular plans drawn up and calculations made as to the cost of the entire work; and also what return could with certainty be expected from the investment. The designs were made by the late John Randall, of Maryland, one of the ablest civil engineers the country has ever produced.

The professor's idea was, to have the street excavated for some twelve feet below its grade. A substantial wall of masonry was to be built on either side to sustain the sidewalk, and a convex iron girder was to cross the entire width of the street, upon which the pavement could be laid. Within the inclosure thus made, the sewer, water, and gas-pipes could be placed, and trap-doors arranged at certain distances to make it possible to get at them without disturbing the pavement. Here could be carried on a vast laboratory for deodorizing the contents of the sewers. His plan also embraced a sort of trap by which the yard of each house communicated with the main sewer, and an arrangement by which the fluid portion was allowed to drain away from the solids, which in turn were to be dumped from the temporary reservoir in which they were received into a small car at the bottom of the excavation, and then carried to the laboratory by a regular railroad intersecting every portion of the city.

This general plan of subterranean sewerage may strike the eye of the uninitiated as very expensive; but when we consider the manipulation a street is subjected to from the time its boundaries are defined by the surveyor, until it has been handed over to the city as complete, by the last contractor, we think the plan will appear in a very different light. In the first place, take a street that requires filling up to a certain specified grade. Sealed proposals or bids are received from contractors for the work, and the party making the most advantageous offer obtains the contract, and in due course of time completes the work. Then, in all probability, a second party obtains a contract to at once put down some kind of pavement. After this, houses are built upon the street, and a sewer must be laid. This completed, the gas and Croton mains must be put down. Then each house must have separate sewer, gas, and water connection. Thus the pavement is perpetually torn up and relaid, each removal rendering it more unfit for travel. Why not, when the street was low enough to lay the sewer without turning out one shovelful of earth, put in the pipes for the sewer, gas, and water, and leave the laying of the pavement until it could be done without having it torn up four or five times for necessities which every one knows will arise? Let any one calculate the vast sums of money spent on a street, in these various changes, and we are sure the amount will be larger than the cost of the plan above proposed, with this great difference, that when the work is completed, in the latter case, a yield of from six to seven per cent upon the outlay could be at once expected, while in the former there would be constant call for additional expense in repairs. Where the grade of a street requires to be raised several feet, it is doubtful if it would cost much more to put up the two walls of masonry and the iron girders than it costs to fill up the space with earth and rocks. Contractors pay from forty to seventy-

five cents per load for this filling; and every one knows how very few square feet the carts used for this purpose hold. Again, the question of an underground railroad has been much discussed during the past few years. With this plan of sewerage, it would be no more expensive to carry such a railroad over the entire city, worked from given points by stationary engines and wire ropes, as is proposed for the overground railroad, than to lay such a road in the streets of the city; excepting that arrangements would have to be made at certain distances to enable passengers to go down to platforms below, for the purpose of entering the cars. This project would at once put into the hands of the city authorities a subterranean city, and also the vast revenues to be obtained from its underground railroads, and does not present half the difficulties that must have been experienced in bringing the Croton water across the Harlem River.

Having shown that nature has particularly favored that portion of the city which lies west of the park, and that, from present indications, the highest art will prevail in the magnificent improvements which are there going on, we will mention another cause, which will add weight to the many reasons already adduced, why it should in the future become the home of the fashion and wealth of the metropolis. If we look at the great capitals of Europe, we will notice the general tendency the affluent classes have shown to select their abodes in the western sections of these cities. Paris, London, St. Petersburg, Berlin, and others show this conclusively. In each, the western section is covered with the elegant palaces of the rulers and the costly mansions of the rich; while on the east side is found the bustling activity of the workshops and manufactories. In a translation from *Le Correspondant* published in the April number of this magazine, the writer, speaking of this subject, says,

"In visiting the ruins of Pompeii and other ancient cities, I have observed, as well as M. Junod, that this custom dates from the highest antiquity. In those cities, as is seen at Paris in our day, the largest cemeteries are found in the eastern parts, and generally none in the western. M. Junod, examining the reason of so general a fact, thinks it is connected with *atmospheric pressure*.

"M. Elie de Beaumont has since mentioned some facts which tend to prove the constancy and generality of the rule laid down by M. Junod. He noticed in most of the large cities this tendency of the wealthy class to move to the same side—generally, the western—unless hindered by certain local obstacles. Turin, Liège, and Caen are examples of this. M. Moquin-Tandon has observed the same thing at Montpellier and Toulouse."

In the first part of this article the influence of "*atmospheric pressure*" was fully spoken of, as also the effect of the winds so favorable to residents on the west side. With these facts in view, it is easy to foresee that those who possess means will always purchase homes in this portion of the city, which offers the best security against disease and the greatest guarantee for continued physical health.

It is curious to go back to the commencement of the present century, and to note the changes in location the growth of the city has obliged the wealthy to make since that time. In the early days, State street, and then Bowling Green, offered to this class attractions superior to those of any other portion of the city. The ample shade of the latter, its stately forest-trees, verdant lawn, and beautiful walks, with the refreshing seabreeze constantly blowing in from old ocean, and the magnificent moving panorama in the harbor, made it a great favorite of our forefathers.

They whiled away their time in this charming resort, smoking their pipes, and watching the merry gambols of the children. It may be, they canvassed the future of this goodly city, which under their thrifty influences already promised well, never dreaming, however, of the gigantic growth its future was to develop. In time this garden spot changed into the great *entrepôt*, where emigrant ships daily landed vast numbers eager to obtain employment and homes in this new country where every thing promised wealth and happiness. Greenwich street next absorbed within its precincts the votaries of fashion; soon after, it had for rivals in public favor East-Broadway and College Place. They, in turn, were deserted for the location between Fourth and Eighth streets. But the same agency being at work here as below, soon brought Union Square into requisition. After this, Fifth and Madison avenues became the grand centres of the opulent classes; and to-day the entire course of the former, with its long line of brown-stone architecture and regal grandeur, attracts the attention and challenges the admiration of the world. But after this avenue reaches Ninetieth street, its grade descends rapidly to the low level of the Harlem plains, and is no longer so desirable for residences. At the rate it is now being built upon, it will soon be completed to this point, and then in what direction will this current turn? The Harlem Railroad will always prove an insurmountable objection to Fourth avenue, which is behind it; and it does not require a prophet's power to foresee that the Grand Boulevard, the garden parks overlooking the Hudson, and the great aids to general healthfulness possessed by the west side, will prove sufficiently attractive to cause the next move to be in the direction of the beautiful sites which border these improvements.

The proposed widening of Broadway from Thirty-second to Fifty-ninth street adds certainty to this prediction. We think it most unfortunate that this change did not commence as low down as Seventeenth street, and we hope it may yet be found advisable to do so. We would then have a noble thoroughfare starting from the Battery, crossing the various avenues diagonally until it reached the beautiful circle at the Eighth avenue entrance to the park; and then continuing as the Grand Boulevard to the upper extremity of the island. This measure, which seems to meet with the disapprobation of a large portion of the community, if carried out, would, we are convinced, prove a crowning glory to the metropolis; and it is but fitting that the thoroughfare which is to vie with any other in the world should have a continuance in the lower part of the city worthy its princely magnificence; for it would then be a subject of pride not only to us but to the whole country, which would regard it as a national ornament.

We may also look forward to an ever-increasing commercial importance for the east side, with its long line of piers fronting the harbor, always filled with vessels bearing the flags of every commercial nation of the world.

Its shore will be covered with capacious warehouses and immense manufactories, from which will resound the noisy bustle and unceasing activity of trade.

A glance at the residences in the different locations mentioned above, as being at various times the homes of those possessing wealth, will show that each successive change has been marked by an increase in the lavish expenditure of means for the purpose

of producing architectural display. With this fact before us, we may form an idea of the palatial houses with which, by means of their rapidly increasing wealth, the rising generation will crown the hillsides of the western section.

When the proposed improvements for this portion of our city have been completed, the whole, bounded on the one side by Central Park, with its many natural and artificial beauties appearing like a fairyland, and on the other by the dancing waters of the Hudson, will give to our metropolis attractions superior to those possessed by the most celebrated cities of Europe.