

THE HARLEM RIVER SPEEDWAY, NEW YORK CITY.

Among the many thousands of New York City who will benefit by the opening of the Harlem River Speedway, there are none who will welcome the event with greater enthusiasm than the admirers and owners of that distinctively American production the fast trotting horse.

It may be said that the contending claims of the city and the horsemen have operated to bring about the building of the Speedway. On the one hand there was the desire of the owners of fast trotters to have within easy reach of the city a level and straight stretch of roadway, unincumbered with traffic, on which they might speed their horses; on the other hand there was the on-rolling tide of a city's busy life, replacing fence and green meadows with curbstone and city "flat," and changing the elastic dirt road, so dear to the horseman's heart, into a Telford or Belgian block thoroughfare.

Many of our readers will remember the time when that part of Seventh Avenue which lies between Central Park and the Harlem River was the favorite speedway of the notable horsemen of the city. Here the finest trotting stock of the country could be seen of an afternoon, driven by such famous owners of fast horses as Commodore Vanderbilt, Colonel Kip, Frank Work, Russell Sage, Robert Bonner, owner of the illustrious Maud S., with many another zealous but less known horseman. Those who cared to would cross the old McCoub's Dam Bridge and continue north along the road of that name, and many of the famous hostilities of that day may still be noted by the passing wheelman, their long, empty hitching sheds testifying in mute eloquence to a decayed or fast decaying sport. The Harlem Speedway owes its existence primarily to the efforts of the lovers of horseflesh; and it is to be hoped that the opening of the drive will go far to revive the waning interest in a noble and distinctively national pastime.

Judging from present indications, the Speedway will be completed in the spring of 1898, and, taken together with the recently constructed Lafayette Boulevard to the west of it on the bluffs of the Hudson River, it will provide the citizens of New York with one of the handsomest and certainly one of the most unique drives to be found in any great metropolis. The Harlem River and its surroundings, as will be shown later in the present article, are endeared to the people of the city, and indeed to all Americans, by the wealth of historic associations with which they abound; moreover, the shores of the two rivers are enriched with natural features of more than common beauty. Add to this that midway along its course the drive passes beneath two of the most notable engineering structures in America—the massive stone

High Bridge and the Washington Bridge with its noble steel arches, the latter of which is the most handsome specimen of its type in existence—and it will be seen that the park commissioners have made a fitting choice in selecting this site for a work whose main object is to provide recreation for the public.

By reference to the small map on the front page it will be seen that the Speedway is laid out along the westerly shore of the Harlem River from One Hundred

further increased by the extension of Amsterdam Avenue by a magnificent steel viaduct northward over Dyckman Meadows. An illustrated description of this structure will be found in the current issue of the SUPPLEMENT.

The prevailing design for the Speedway, which was only departed from where the limitations of the route demanded it, calls for a roadway 95 feet wide, flanked by two planting spaces 10 feet wide, one on each

side, for shade trees, with an easterly sidewalk 20 feet wide and a 15 foot sidewalk on the west. The easterly limits of the Speedway were sharply defined by the government bulkhead lines, within which, except where it passes beneath the Washington Bridge, the outer walls have always been maintained. The westerly limits of the work have been fixed by the steep projecting bluffs of rock, into which it was desirable to cut as little as possible, every extra foot of width increasing the amount of excavation to enormous figures. This can be understood by reference to the great rock cut a thousand feet long to the north of Washington Bridge, where 160,000 cubic yards of solid rock were taken out,

the depth of the cut at the highest point being fully 110 feet. Further limitations were imposed by existing structures, such as the gate house of the Croton Aqueduct and the piers of the two bridges above mentioned, the width of the roadway being narrowed down to 66½ feet where it passes between the piers of High Bridge. In general the location has been well made and, taken with the improvements on the original plans which have been made by the new Board of Park Commissioners, and are being carried out under the superintendence of Mr. J. A. Lockwood, as engineer in charge, and Prof. William H. Burr, of Columbia College, as consulting engineer, the Speedway promises to be a credit to the city of New York, and certainly one of the handsomest among its public works.

The southern entrance to the Speedway is located where the One Hundred and Fifty-fifth Street viaduct reaches the westerly bluffs of the high land to the south of Washington Heights. Here is also the point of interception of Edgecombe Avenue and St. Nicholas Place, both of which will have ready access to the drive. For the first half mile the roadbed falls on a four per cent grade to its river grade, six feet above mean high water. It follows the face of the bluffs and lies partly in cut and partly in fill, the material that has been blasted from the cliffs being utilized for the fill, which is held in place by a heavy retaining wall of broken range masonry. This is the most massive piece of masonry in the whole work, and involved the laying of no less than 15,000 cubic yards of stone.

At the foot of the grade the roadway



RAISED WESTERLY SIDEWALK, NORTH OF WASHINGTON BRIDGE, SHOWING RETAINING WALL, AND UNFINISHED ROADWAY AT GRADE.

and Fifty-fifth Street to a junction with Dyckman Street, the total length being about 11,500 feet, or over two miles. It forms the eastern stretch of a circular driveway whose total length is approximately six miles, the western half, with which it will be connected by Dyckman Street, being formed by the practically completed Lafayette Boulevard, extending from the intersection of Dyckman Street and the Kingsbridge Road south along the banks of the Hudson River to One Hundred and Fifty-seventh Street. From One Hundred and Fifty-seventh Street an easy connection is made with the southern entrance to the Speedway by way of One Hundred and Fifty-fifth Street.

It should here be mentioned that the splendid driving facilities of Washington Heights are likely to be



HARLEM RIVER SPEEDWAY—UNFINISHED ROADWAY SOUTH OF HIGH BRIDGE, SHOWING SOLID MASONRY TRENCHES IN WHICH TO PLANT SHADE TREES.

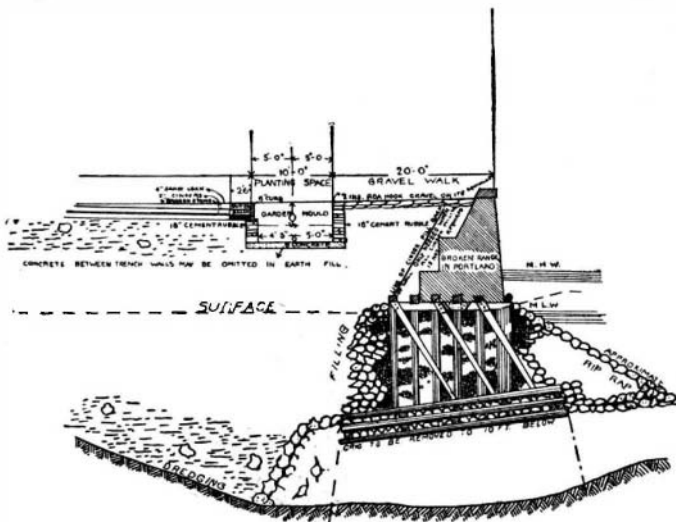
widens out to a width, from curb to curb, of 160 feet, in order to accommodate what is known as a "turnabout," where the horsemen who may not wish to leave the Speedway may return without climbing the grade to One Hundred and Fifty-fifth Street. The center of the "turnabout" will consist of a circle forty feet in diameter, which will be planted with trees and shrubbery. At this point will also be located the first of the three subways, the other two being built at High Bridge and Washington Bridge. These subways are built to enable foot passengers to pass from one sidewalk to the other without crossing the Speedway, a necessary provision where the roadway is devoted to fast driving. The first subway is built through the roadbed where it consists of a heavy fill, and consequently the side walls are carried upon piling, which is driven through the softer material to solid bottom. The piling is three feet from center to center, the spaces between the tops of the piles, for a depth of several feet, being filled in with cobblestones. Upon this foundation concrete walls are built up to the level of the floor, which is carried upon a brick arch. Above the floor the subway walls are built of dressed limestone and carry an arched granite roof. The details of the stairways will be massive and simple, to harmonize with the general features of the work.

It should be mentioned that the first half mile of the roadway is to be finished with a first-class Telford surface in place of the "dirt road" which it was originally intended to build for the whole two miles of the Speedway. This is one of the improvements which have been made by the new Park Board, and it will give a more durable surface on the four per cent grade, where the traffic and the weather will produce most wear. In general, however, the surface will be made to conform as far as possible to a country road, the macadamized road being considered by horsemen too hard for the fast driving for which the Speedway is intended. It is built as follows: The roadway is filled in with clean material to within a foot of sub-grade. Above this is laid clean earth, with no stones in it over three inches in size. This is rolled with a two ton roller. Above this is laid eight inches of stone, of a size that will pass through a two inch screen but be retained by a one inch screen. This layer is rolled with an eight ton roller. Then follows a two inch layer of cinders, rolled with a two thousand pound roller. Above this are two four inch layers of sandy loam, each of which is rolled with a two ton roller. The result is a firm but elastic surface, admirably adapted to fast driving.

From the foot of the grade the roadway has a slight rise to High Bridge, which marks the termination of the first section (or about one-half) of the work. The easterly walk, which in general is twenty feet wide, is at the same grade as the roadway, but the westerly walk rises and falls with the contour of the ground, in one place being twenty-eight feet above the surface of the roadway. In such cases it is carried by a retaining wall, as shown in the accompanying illustration. While this arrangement was necessitated by the natural features of the site, it will certainly add to the picturesque appearance of the driveway.

Some of this work as originally carried out failed to stand, and slid out into the river. Wherever this occurred the old cribwork is being dredged out preparatory to building a solid masonry bulkhead wall upon a pile foundation. Among other improvements introduced by the Park Board upon recommendation of the board of experts, masonry retaining walls and bulkheads have been built in place of the timber cribs wherever it was possible, a change which affects 1,600 feet out of the total 8,500 feet originally contemplated.

Of all the improvements introduced by the Board the most commendable was the provision for giving the Speedway landscape treatment. By an extraordinary



**CROSS SECTION SHOWING CONSTRUCTION OF MASONRY TRENCH,
SIDEWALK, BULKHEAD AND CRIB, HARLEM RIVER SPEED-
WAY.**

oversight, under the original contract no provision had been made for planting trees and shrubbery, an omission which would have produced a very bald and unfinished effect on a roadway of such wide proportions and containing long stretches of masonry retaining wall and asphalted sidewalks. It was determined to provide planting spaces ten feet wide on each side of the roadway, wherever the width of the site would permit, and fill them with shade trees and shrubbery. As under the original contract no landscape treatment had been contemplated, the roadway had been built with any kind of material that was suitable for filling, and as one contractor had a large amount of cinders available, the fill in places consisted largely of this material. To provide a suitable soil for the trees it was decided to lay trenches and fill them with garden mould in sufficient quantity to support the trees when they should attain their full growth. The idea was a good one ; but the method of carrying it out, as will be seen by reference to the photographs and the small sectional view, was as extravagant as it was extraordinary. A solid, compact masonry and concrete box was built in which to place the mould. The walls are ten inches thick, and the bottom consists of eight inches of concrete. This trench, which will be practically watertight and without the least provision for drainage, extends in an unbroken line for thousands of feet, and within its close confine

masonry in the first retaining wall, 15,700 yards of masonry in subways and bulkheads; 2,186,000 cubic feet of cribwork; 147,000 lineal feet of piles, and 216,000 cubic yards of filling.

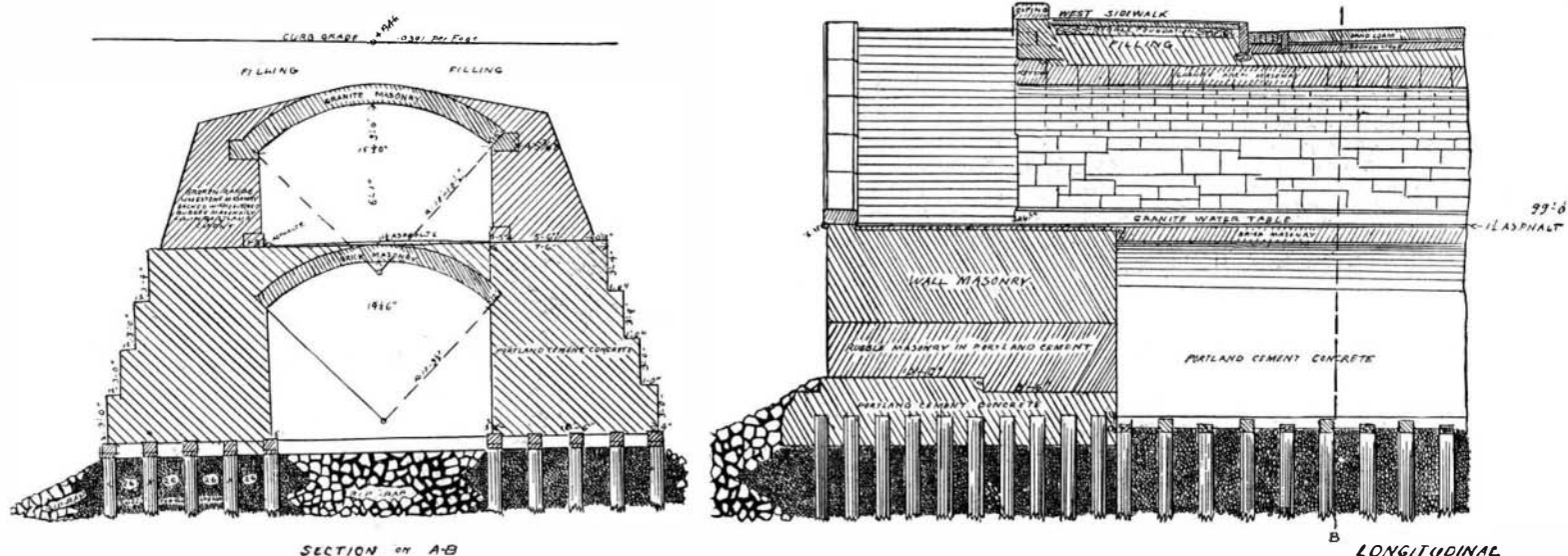
(To be continued.)

Jumping Cocoons.

The curious movements of jumping beans have lately attracted some attention, though to style the spasmodic jerks of the beans jumps is to court disappointment. Some "jumping cocoons," described by Dr. D. Sharp in the Entomologist, were, however, remarkably good athletes, for they could spring out of a small vessel, such as a tumbler, in which they were placed. These cocoons were from South Africa, but in spite of their exceptional gymnastic efficiency, Dr. Sharp hardened his heart and sacrificed them upon the altar of science, in the hope of discovering something unusual that would explain the power of jumping. The cocoons looked like a piece of oval pottery, about five millimeters long, and having a rough surface. In each of the two investigated a pupa was found; the two were similar in every respect, and they no doubt belonged to the larvæ that made the cocoons. "This little pupa," says Dr. Sharp, "is shut up in a remarkably hard thick cocoon, and it has to get out. Nature has not provided it with caustic potash for the purpose, but has endowed it with a mechanism of complex perfection to accomplish this little object. On the front of the head it has a sharp chisel edge, and with this it has to cut through the pottery; contracting itself to the utmost in the posterior part of the cocoon, and retaining itself in this position by the hooks on the mobile part of the body, it is in a condition of elastic tension in consequence of the other side of the body being so differently formed and immobile;

A Weather Observatory on Mont Rosa.

The success which has attended the installation of a meteorological observatory on the summit of Mont Blanc has stimulated Italian men of science to crown Mont Rosa with a similar edifice, says the Practical Engineer. It is intended to utilize the hut on the Gniffetti peak, built three years ago as a shelter for climbers. Situated at a height of about 14,000 feet above



LONGITUDINAL AND CROSS SECTION THROUGH PASSENGER SUBWAY, HARLEM RIVER SPEEDWAY.

About half way between One Hundred and Fifty-fifth Street and High Bridge occurs the first stretch of timber cribwork. This class of construction was adopted wherever the roadway had to be carried across the small bays of the river. The mud of the river was first dredged out to hard bottom, which, on this section, was reached at an average depth of twenty-eight feet below low water. The first layers of the crib were then sunk by loading with rock and the structure raised to the required height and filled in with broken stone or such as one man could handle. The outer wall is formed of 10x12 sawed timbers, laid with broken joints and strongly drifted together.

ment the roots of the future shade trees of the Speedway are destined to rot in winter and bake in summer, "cribbed, cabined, and confined" beyond any chance of expansion, and in violation of the very first principles of vegetable growth. How the responsible parties who have done so well in the general work of revision and reconstruction should have committed themselves to such a piece of extravagant folly as this, passes comprehension. Further reference to the matter will be found in our editorial columns.

Some idea of the extent of the work on the first section is gained from the total estimates of the work done to date, which include, in addition to the 15,500 yards of

sea level, it will, as regards elevation, rank fourth among the twenty-seven mountain observatories of the world, being surpassed in altitude only by those of Arequipa, Mont Blanc, and Pike's Peak.

THE council of the Royal Colonial Institute have sent a memorial urging the British government to take early steps for the unification of time at sea. The memorialists say that the question is the simple one of the desirability of advancing astronomical time by twelve hours, so as to harmonize it with civil time, for nautical time has in general practice long been assimilated to civil time.

SCIENTIFIC AMERICAN

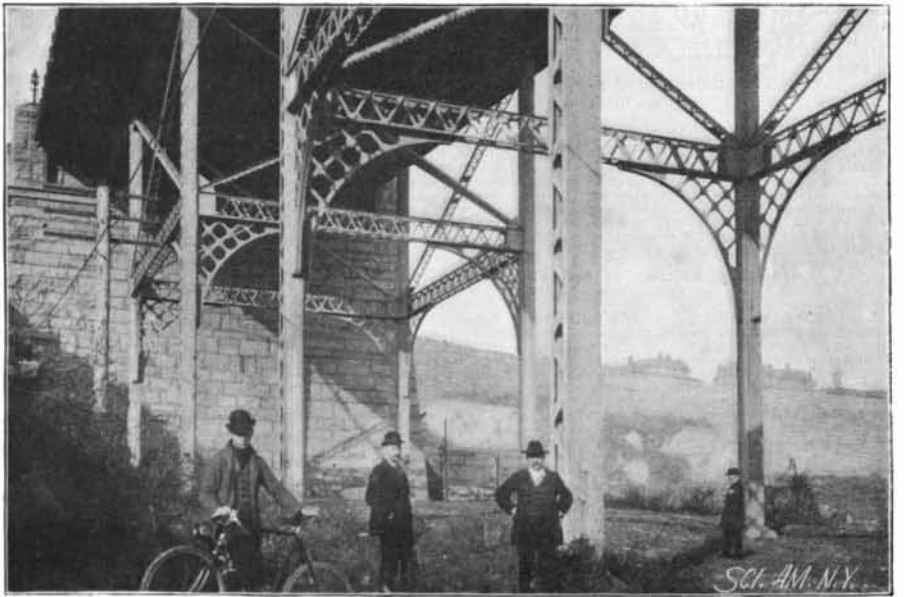
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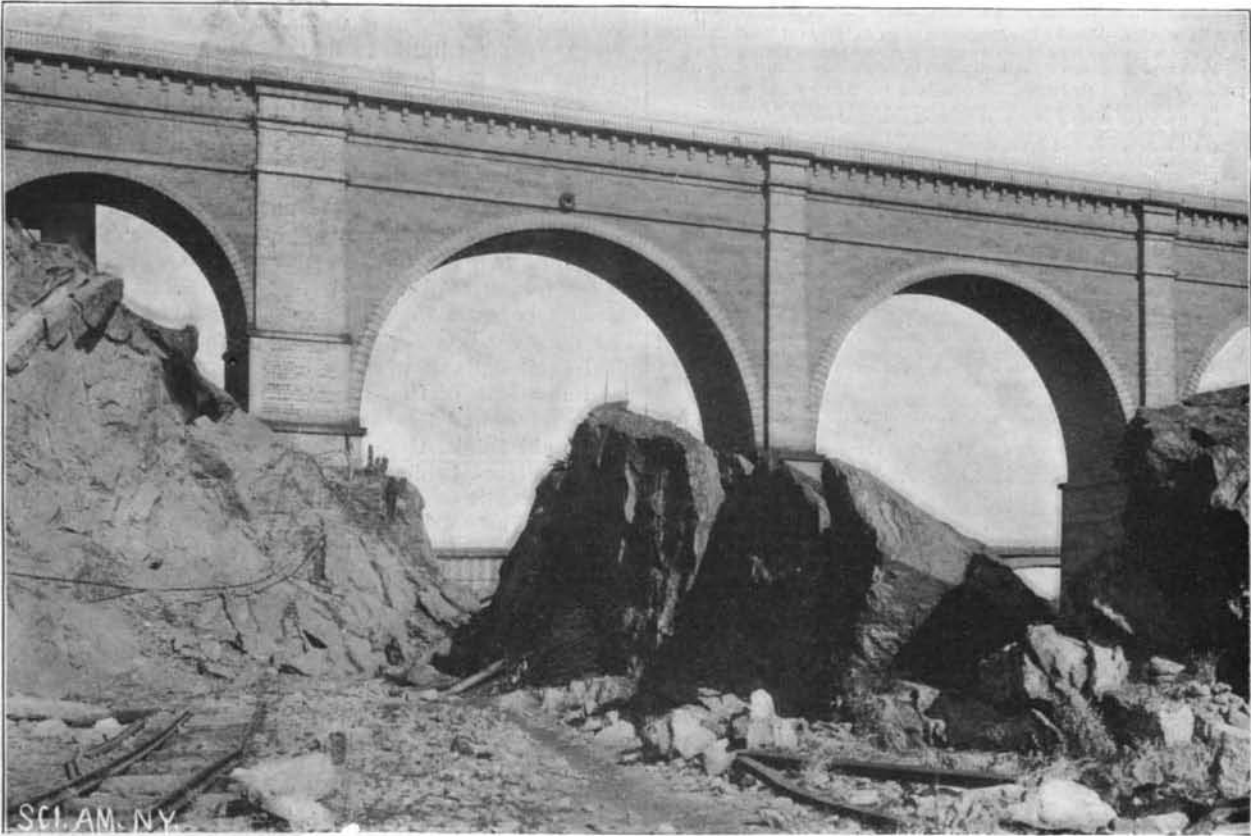
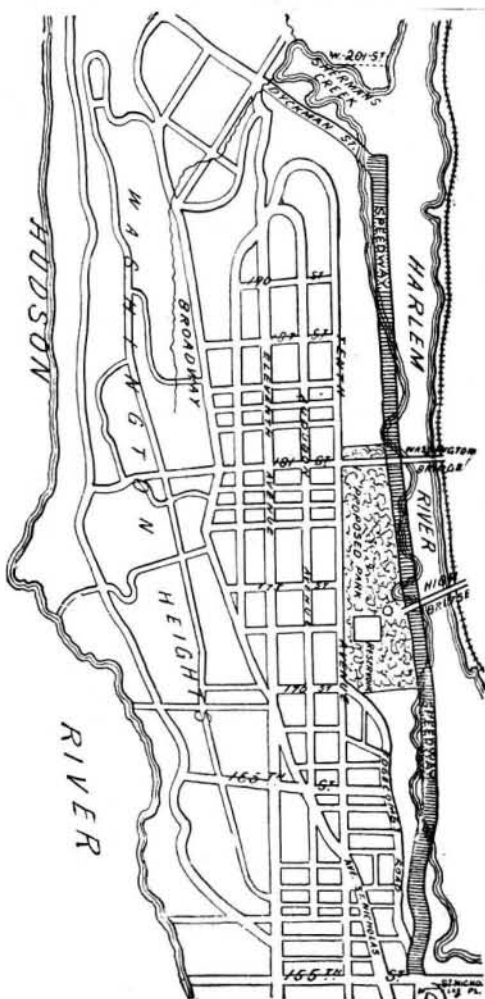
VIEW OF UNFINISHED ROADWAY, SHOWING WASHINGTON'S HEADQUARTERS UPON THE BLUFF.



BENEATH THE 155th STREET VIADUCT—RETAINING WALL OF THE DRIVEWAY SEEN AGAINST THE BLUFF.



DREDGES REMOVING TIMBER CRIB, TO MAKE WAY FOR MASONRY CONSTRUCTION.



ROCK CUT SOUTH OF HIGH BRIDGE—UNFINISHED ROAD AT GRADE.

PRESENT CONDITION OF THE SPEEDWAY, HARLEM RIVER, NEW YORK.—[See page 89.]