

## THE UNDERGROUND RAILWAY, NEW YORK CITY.

NUMBER IX.

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## THE PASSENGER STATIONS.

With the exception of that in the viaduct, described in our last article, all the stations are beneath the street level. The first of these underground landings occurs in the beam tunnel, midway between 58th and 59th streets. It consists of two waiting rooms and two landings, one of each for each side tunnel, placed immediately beneath one of the rectangular openings of the central tunnel. The platforms are 150 feet long, 12 feet broad, and 3 feet 6 inches above railroad grade. Along its entire length the outside rubble retaining wall of the tunnel is removed and set back 11 feet nearer the house line, its place being supplied by a row of cast iron columns 10 inches in diameter at the base of the shaft, 10 feet 6 inches high, and of  $\frac{1}{2}$  inch metal. They are placed 11 feet 9 inches apart and 3 feet from the inner edge of the platform. About the center of the platform the retaining wall is again interrupted for a distance of 59 feet, and set back 20 feet nearer the house line, thus forming a recess 20 feet by 59 feet, which contains the waiting room, ticket office, water closet and vaults. The waiting room is 36 feet long, 10 feet wide and 11 feet 6 inches high. From the north end of this room rise iron steps which lead to the sidewalk. These steps are 8 feet broad, have iron frames and risers, with wooden treads, and are divided down the center by an iron railing 3 feet high, which also extends from the foot of the stairs to the ticket office, thus separating the flight into two flights, one to be used by passengers ascending from the station to the street, and the other by those descending. At the exit on the sidewalk, these steps are covered by a neat wooden house 8 feet x 12 feet, and lighted by patent lights placed in the roof. The general style of this house is shown in Fig. 6, page 338, volume XXXI.

The roof of the station, like that of the tunnel, is composed of H iron beams and turned arches between them. Along the top of the iron columns run the two girders previously described; along the retaining wall which bounds the platform is placed one H beam, and upon the 20 inch brick walls, which form the inner walls of the waiting room and stairway, rest two more girders. Upon these are placed transversely the H beams similar to those used in roofing of the beam tunnel, and between them the brick arches.

The lighting of the station is derived from eleven patent lights, 3 feet in diameter, placed in the sidewalk immediately over the waiting room, from the lights placed in the roof of the house covering the stairs, and from the rectangular opening in the roof of the central tunnel. The ventilation is also largely derived from this latter opening, but also through the ventilators in the side of the house over the stairs.

The station at 72d street is precisely similar to that at 59th street, and needs no description. The station at 86th street is illustrated in elevation in Fig. 23. It differs essentially from those just described. There are two stations, one for each of the two side tunnels; but unlike the 59th street station, they are placed on the inner side of the small tunnel, or the side nearest the central tunnel, and do not have a waiting room. They consist really of a covered platform, 172 feet long, 13 feet 8 inches wide, and 3 feet 10 inches above the railroad bed.

Along the inner side, and separating the side from the center tunnel, runs a rubble wall, 4 feet thick, with vertical faces and lined on the side of the platform with brick. Three

feet six inches from the inner edge of the landing is a long row of cast iron columns, 10 inches in diameter at the base, 11 feet 4 inches high, and of  $\frac{1}{2}$  inch metal. These columns support two 15-inch heavy girders placed side by side, their flanges touching. Upon these rest the roof beams and turned brick arches.

At the south end of these platforms is the ticket office. A flight of four steps leads from the street to the platform on which this ticket office stands; and from this landing go off, to the east and west, two other flights which lead to a platform below the street grade, and from these latter landings a final flight, at right angles to the latter, leads to the platform beside the track.

At the north end of each platform is a small waiting room 35 feet by 8 feet.

The last station on the road is between 125th and 126th streets, in the open cut and upon the west side of the track. Its general appearance is well shown in Fig. 22, which also shows in perspective the open cut through Harlem and the various bridges at the street crossings. In plan, this

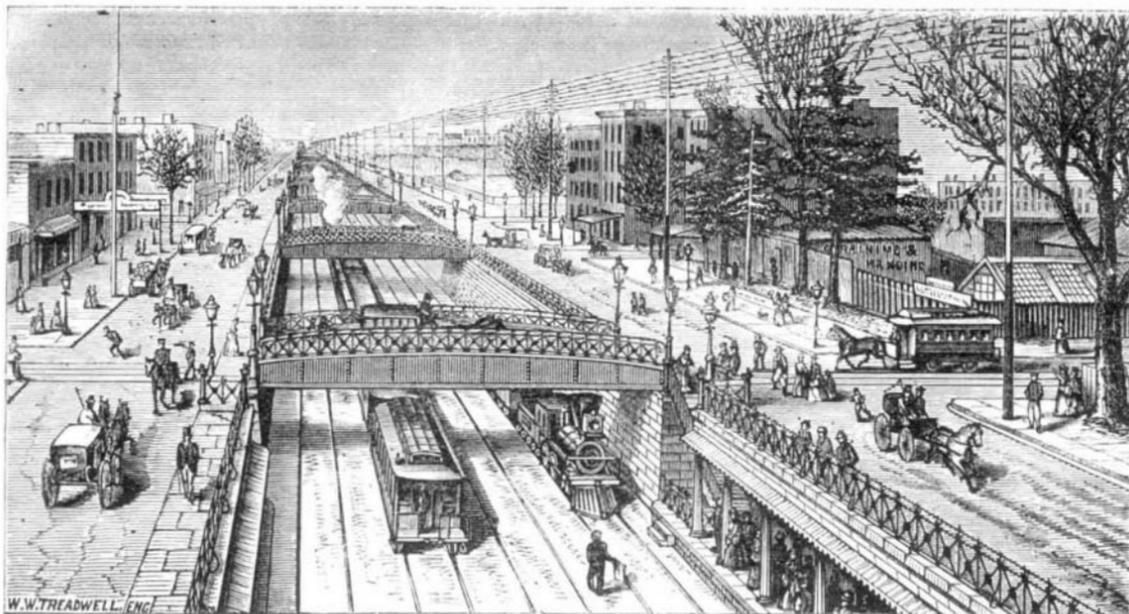


Fig. 22.—THE UNDERGROUND RAILWAY, NEW YORK CITY.—PASSENGER STATION AT 125th ST.—THE HARLEM OPEN CUT AND CROSS STREET BRIDGES.

station consists of a platform, 164 feet in length, 8 feet in width, 2 feet 10 inches above railroad grade and composed of a layer, 12 inches thick, of broken stone covered with 4 inches concrete and 12 inches hard finish. The platform is covered over its entire length by a corrugated iron roof, resting upon 9-inch heavy beams supported upon 15-inch heavy girders, which in turn rest upon cast iron columns, of the same kind as those used in the other stations, placed 12 feet apart and 4 feet from the edge of the platform. These columns rest upon cap stones 8 inches thick and 2 feet square.

At the south or 125th street end of the platform are the waiting room, ticket office, vaults, etc., occupying a recess 53 feet by 10 feet. These rooms are covered by 15-inch heavy beams and 8 inch turned brick arches. The stairs from the platform to the street are also at the south end, are 5 feet wide with yellow pine steps and cast iron risers and strings, supported by 9-inch heavy beams.

## Weight and Height of Americans.

According to a recent work of Mr. B. A. Gould, Actuary to the United States Sanitary Commission, in which some very interesting figures relative to soldiers in the last war are given, it appears that the American nation, instead of being degenerate and inferior to the European race in point of physical perfection, is far the reverse. The figures adduced show that "the tallest men were from Michigan, Illinois, and Wisconsin; the next tallest, New England, New York, New Jersey; and the shortest from Scotland, England, Germany." In weight, the men of Kentucky and Tennessee were the heaviest, averaging 150 pounds; England, Scotland, France, Belgium, all between 138 and 139 pounds. The ratio of

weight to stature gave in pounds to the inch: Ohio and Western States, 2.185; New England, 2.121; England and Scotland, 2.118; Germany, 2.168.

## A Layer of Hydrogen above our Atmosphere.

In a paper read before the Manchester Literary and Philosophical Society, Henry H. Howorth observes: "It is clear that, if under certain conditions hydrogen be an exception to the general law of the diffusion of gases, and follows rather the more general law of gravitation, it will exist in a stratum above the atmosphere and beyond the reach of direct observation. In his experiment upon the occlusion of gases, Mr. Graham examined several aerolites, and found that, under the air pump, they parted with a very large quantity of occluded hydrogen. If, as is probable, the gas was occluded by the aerolites when at a red heat, and this red heat was coincident with their passage through that layer of the upper atmosphere in which the phenomena of shooting stars and of the aurora occur, it seems more than probable that this stream is a layer of hydrogen. This is confirmed

by what we know of the spectrum of certain auroras, which resembles those of the zodiacal light and the solar corona. The spectrum of the corona has been the most attentively studied, and Janssen, perhaps the greatest authority on it, speaks most confidently about its distinguishing feature being the hydrogen lines, while a special line, which characterizes both its spectrum and that of aurora, and which is different to that of any terrestrial substance, is considered by Father Secchi to be an abnormal hydrogen line. Dr. Dalton long ago argued, as Mr. Baxendell has reminded Mr. Howorth, that the peculiar features of the aurora could best be explained by the hypothecation of a stratum of some peculiar gas above the atmosphere. A gas of a 'ferruginous nature' is the expression of Dr. Dalton. Now hydrogen, in

the higher chemistry, is not only classed among the metals, but Faraday and others have shown that in its relation to magnetism it is nearly allied to iron, so that a stratum of hydrogen above the air would seem to exactly answer Dr. Dalton's postulate. If it should exist, the earth would resemble the sun in one remarkable feature, for we now know that the sun is girdled with an immense layer of hydrogen. Lastly, he would add that the heterogeneous texture of the gaseous nebula, like the great nebula in Orion, seems to argue that the law of the equal diffusion of gases does not prevail there."

## Singular Mathematical Fact.

Any number of figures you may wish to multiply by 5 will give the same result if divided by 2—a much quicker operation; but you must remember to annex a cipher to the answer, whenever there is no remainder, and when there is a remainder, whatever it may be, annex a 5 to the answer. Multiply 464 by 5 and the answer will be 2,320; dividing the same number by 2 and you have 232, and, as there is no remainder, you add a cipher. Now take 357, and multiply by 5; there is 1,785. Divide the same number by 2, and you have 178 and a remainder; you therefore place a 5 at the end of the line, and the result is again 1,785.

## Wicks of Kerosene Lamps.

The unsatisfactory light frequently given by kerosene lamps is often due to the wick. The filtering of several quarts of oil through a wick, which stops every particle of dust in it, must necessarily gradually obstruct the pores of the wick. Consequently although a wick may be long enough to last some time, its conducting power may be so impaired that a good light cannot be obtained.

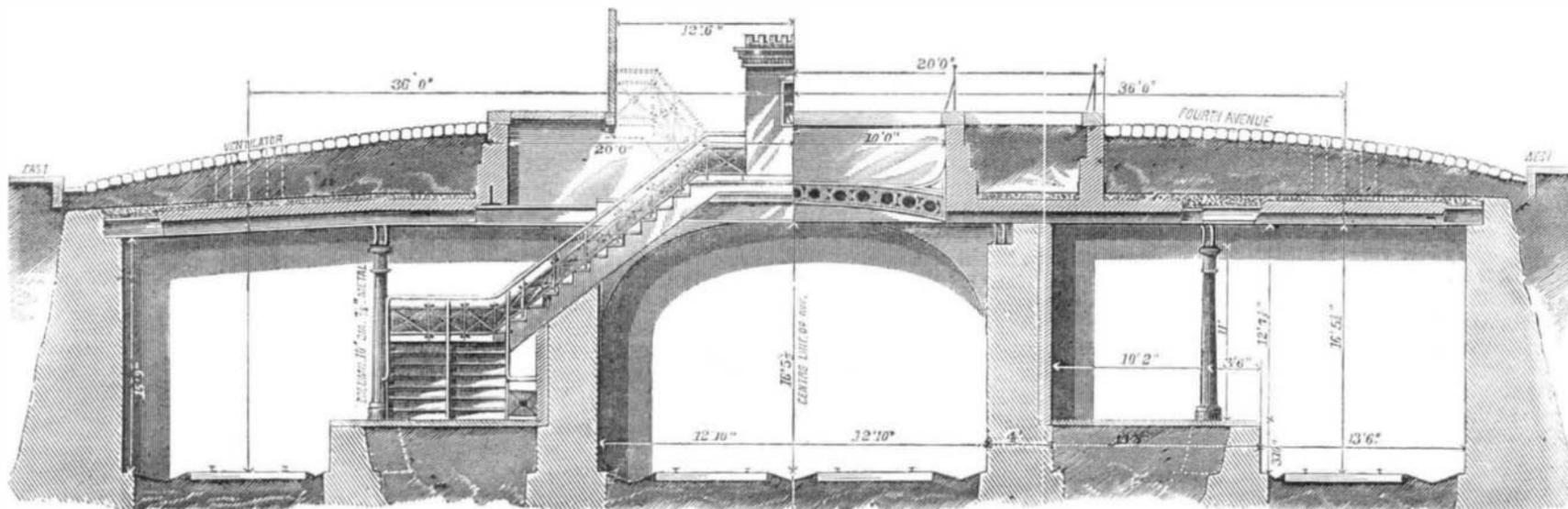


Fig. 23.—THE UNDERGROUND RAILWAY NEW YORK CITY.—THE 86th STREET PASSENGER STATION.