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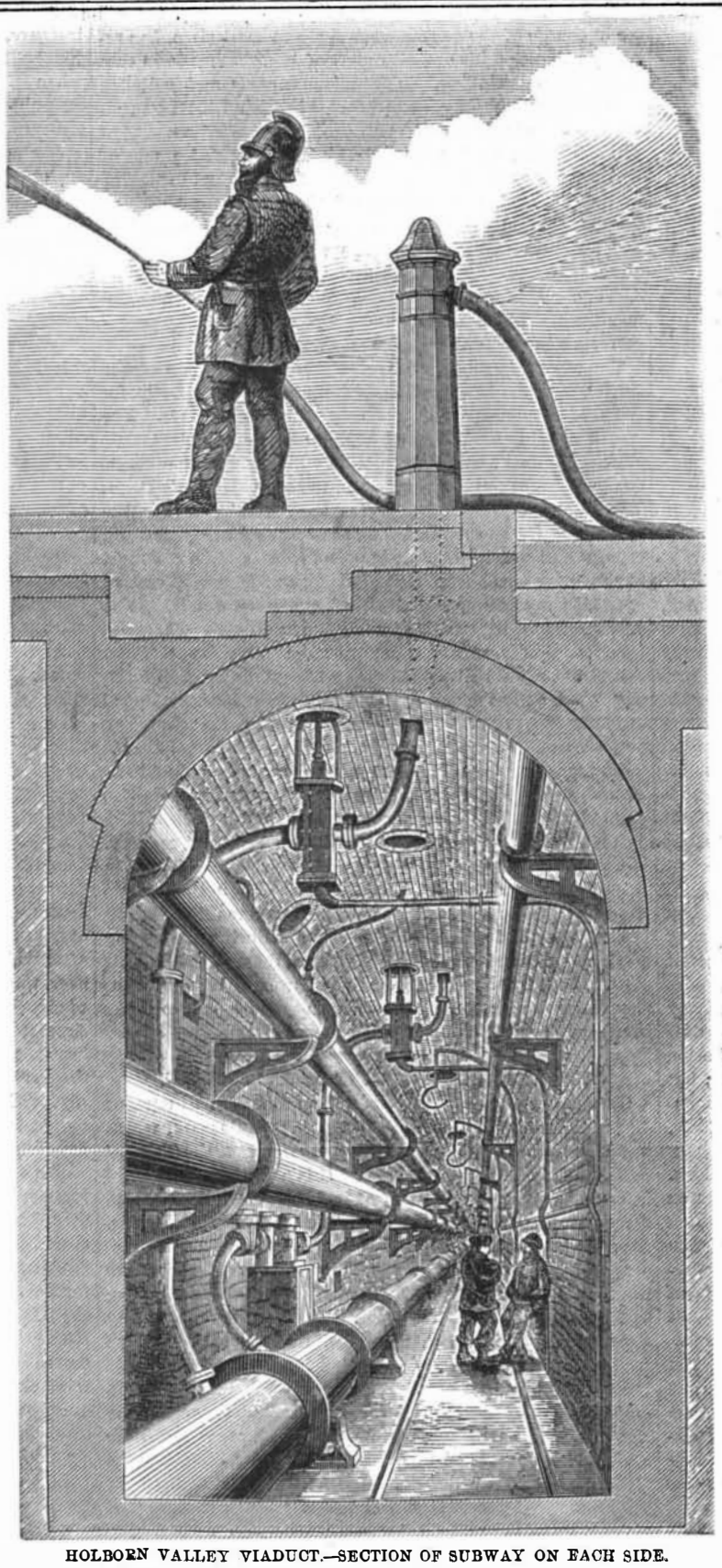
HOLBORN VIADUCT SUBWAYS.

In the construction of the Holborn Valley viaduct, and the streets connected with it, the corporation of London determined to introduce subways for gas, water, and telegraph pipes, and thus to prevent the breaking up of the road surface, which is so often necessary with the ordinary system of placing them in the ground beneath the public way. As a means of conveying water, subways have, for some years, been used in Paris, and more recently in London. They were first introduced in London in the construction of Southwark street, from Blackfriars road to the Borough. The conveyance of gas, however, requires special arrangements for ventilation to prevent the risk of explosion, and the subways under the Holborn viaduct are believed to be the first constructed with a view to their safety when used for this purpose. The arrangements must here be explained. In the Holborn viaduct there is a subway, 7 feet wide and 11 feet 6 inches high, on each side of the road, running between the great arches which carry the roadway and the house vaults which support each footway. The subways are immediately above the sewers, and are well drained, floored with large slabs of York stone, and lined with light gault bricks. In each subway a 14 inch main pipe of the New River Company is carried by iron chains near to the wall nearest the frontage of the houses, and above it 10 inch gas mains, belonging to the City of London and Great Central Gas Companies, are supported on iron brackets projecting from the wall; on the opposite side of the subway a pipe, containing the telegraph wires, is carried in a similar way. All the pipes are so fixed that workmen can easily examine and repair the joints; and, in anticipation of the new buildings, junctions with the gas and water pipes have been made for each house; from these junctions the pipes will be conducted through holes formed in the sides of the subways and communicating with the house vaults. Branch pipes are laid on from the subways to the street watering posts, and to the fire hydrants in the streets, and gas is laid on to the street lamps. All the usual valves, meters, and other apparatus are accessible within the subway itself. Rails are laid along the floor of each subway, on which runs a traveling crane, to facilitate the removal and fixing of the gas and water mains. The subways are ventilated by means of small circular gratings fixed in the footways along the center of each subway, and by flues which run up the party walls of the houses and terminate above the roofs. Every street lamp, and every post along the edge of the footways, communicates also with the subways, and is so perforated as to act as an efficient ventilator. Wherever practicable, the doors of entrance are also constructed of open iron work. Hitherto the ventilation has been perfectly efficient, and no danger is apprehended from the use of naked lights or from the gas jets by which the subways are lighted at times of inspection. One portion of the viaduct subways, between Farringdon road and Shoe lane, has been lighted by means of Hyatt's patent vault light, an American invention introduced into England by Mr. Haywood, the engineer of the Commissioners of Sewers, who designed the Holborn viaduct. It consists of a large frame of cast iron glazed with thick bosses of glass, let into the footways, at intervals, over the crown of the arch of each subway, forming a very efficient means of lighting. In Charterhouse street, Snow hill, and in the other subsidiary streets, there is but one subway, of a lower form, 12 feet wide and 7 feet 6 inches high, running under the center of the roadway. In these, the pipes are laid on dwarf walls along each side of the central pathway. In all other respects, the arrangements are as nearly similar to those already detailed as the circumstances would allow.



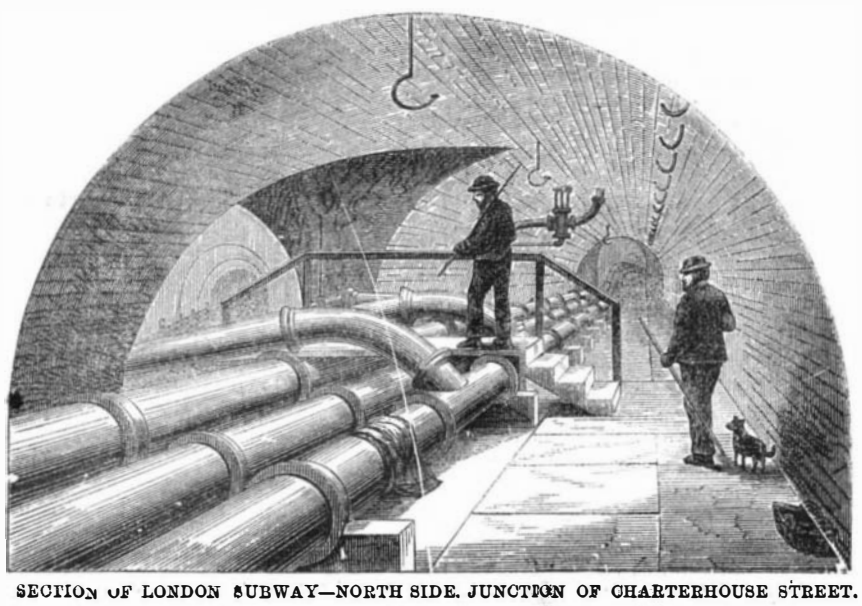
HOLBORN VALLEY VIADUCT.—SECTION OF SUBWAY ON EACH SIDE.

Jasmine Pipe Stems.

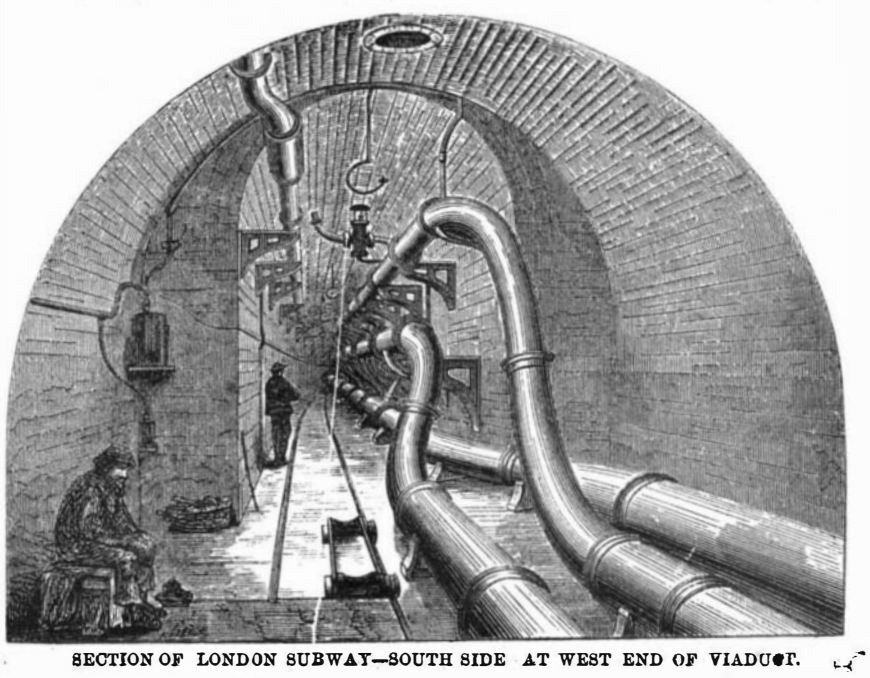
In a recent number of the *Revue Horticole*, M. Barillet describes the cultivation of the common jasmine (*jasminum officinale*), near Constantinople, for the purpose of tchibouk (pipe) making. The object sought is a long straight stem, free from leaves and side branches. For this purpose the plants are grown quickly in a rich soil, and drawn up by being grown in a sheltered situation, to which the sun has little access at the sides, but only at the top. Pinching is resorted to, and during the second year's growth one end of a thread is attached to the top of the jasmine stem. This thread passes over a pulley attached to the post to which the jasmine is trained, and from it is suspended a weight, the effect of which is to keep the stem always in a vertical direction. When the jasmine stem is about two centimeters (say ¾ inch) in diameter, a cloth is wrapped around it to prevent access of dust and of the sun's rays. Twice or thrice in the year the stem is washed with citron water (*eau de citron*), which is said to give the clear (*claire*) color so much esteemed. When the stem has acquired a length of some 15 feet it is cut down and perforated by the workmen, and fitted with a *terra cotta* bowl and an amber mouth piece. The length of the tchibouk stems varies from one to five meters (3 feet to 16 feet about); in the latter case as much as $100 is demanded for their purchase.

Annealing.

The change produced by annealing is not well understood. Most of the malleable metals assume two distinct forms: one crystalline, which is the result of slow cooling, and the other fiberous, which is brought about by hammering or rolling. If hammered or rolled beyond a certain point, the metals become so hard that they cannot be bent without breaking. If annealed beyond a certain point, the metals become crystalline. The particles of the metal change their arrangement without altering the external form. Hence it is necessary to preserve wire, such as is used in the manufacture of pins, in a dry air, or under the surface of water.



SECTION OF LONDON SUBWAY—NORTH SIDE. JUNCTION OF CHARTERHOUSE STREET.



SECTION OF LONDON SUBWAY—SOUTH SIDE AT WEST END OF VIADUCT.

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