stroke of the pump of four and a half feet, a diameter of sixteen inches, and the wheel making eleven and a half revolutions in a minute. Five have been put in operation since, none of which make thirteen revolutions in a minute, with a little more water-fall, and force 14 million of gallons in twenty-four hours. If wheels being sunk below the usual sill of high water, it might be supposed that they would be obliged to stop at that time; but this seldom happens, except in the spring tides, at the full and change of the moon, when it is found that they are not affected until the back water is about sixteen inches on the wheel.

The first four pumps were made by Messrs. Rush & Muhlenberg, and the two last, by Messrs. Levi Morris & Co., in accordance with the designs of Mr. Graff, and are worked by a couple on the water wheel attached to a pump, with the piston connected with the piston at the end of the slide. They are fed under a natural head of water, from the forebays of the water wheel, and are calculated for a six feet stroke, but they are generally worked with not more than five feet. They are double forcing pumps, and are of each connected to an iron main of sixteen inches diameter, which is carried along the bottom of the race to the rock at the foot of Fair Mount, and thence up the bank to the new reservoir. At the end of each pipe there is a stop cock which is closed when needed for any purpose. The shortest of these mains is two hundred and eighty-four feet long; the others are somewhat longer. The water is elevated into the reservoir 102 feet above the level of the tide in the Schuylkill.

The lowest estimate of the quantity of water afforded by the river in the dry season, is four hundred and sixty millions of gallons per twenty-four hours. The average quantity of water raised by each wheel and pump is about 530,000 gallons daily; but when the whole six are called into service they can furnish a supply of over six millions of gallons daily, and that quantity may be increased to eight or ten millions, by the erection of two more wheels and pumps, which will complete the original design, and fill up the present mill buildings. The average daily supply of water for the city and Liberties is estimated for the present year at about four millions of gallons, being an average of 177 gallons for each permit granted. The demand during the summer months is nearly one third more than in the winter months.

According to the above estimate the whole population of our city will have to be more than doubled before there will be any scarcity of water, even with the present works, after which time it is contemplated to erect works at Fair Mount, on the Schuylkill, six miles above the city, and carry the water from thence by large iron pipes or a stone aqueduct to the neighborhood of Girard College, where receiving reservoirs will be constructed. It is proposed that in this work the Liberties shall unite with the city. The difference in fall between Fairmount and Fair Rock is ten feet in favor of the latter, and works can therefore be constructed there to supply any amount of water required; and hence below the Schuylkill.

The elevation of ground at Girard College is eighteen feet above the reservoirs at Fairmount. It is intended therefore that the College shall be supplied with water from Fairmount by means of a small pump to be attached to the present works, designed by Mr. Graff, which will also supply the Eastern Seminary, the water for which being now obtained from natural springs in the earth, by means of a steam engine, it being too high to receive its supply from the reservoir at Fairmount. The water for the College will be forced into tanks on the top of one of the cut houses, whence it will be distributed to the other buildings. It will require 6000 feet of pipe to convey the water to the College, and the new pump, wheel, &c., which is to be constructed at the north end of the mill buildings for that purpose, will cost about $15,000.