the size of the mains, with the view of laying duplicate ones here-after, when a greater supply would be called for.

The consulting engineers in their report of Dec., 1856, say: They "have arrived at the conclusion to recommend that the plan be based on an average daily supply of 35 gallons and a maximum of 50 gallons per head; at the same time to keep in view such enlargement as your city may desire, when this quantity shall be deemed inadequate to its wants. The average supply for a population of 30,000 on the basis above presented would be 1,050,000 gallons per day, and 1,500,000 gallons for the maximum supply. This is equal to an average of 117 cubic feet, and maximum of 166 cubic feet per minute. To pass this quantity through an 18-inch pipe would require a velocity for the average supply of $1\frac{1}{10}$ feet per second, and for the maximum supply of $1\frac{9}{10}$ feet per second, and if the velocity be carried to 2 feet per second it would be sufficient for the maximum supply of 40,000 people. This last velocity is rather more than is desirable for the pumping main, but not materially objectionable. It is therefore proposed to put down an 18-inch main pipe which is ample for the present population and will answer the purpose until the population approaches to 40,000, when a second main may be laid, either 18 or 20 inches, as may appear desirable after the experience of the works shall demonstrate what may be necessary. One 18-inch main together with one 20-inch main will discharge the same quantity under equal head as a 24-inch main. The cost of the latter will be about $1.80 per foot less than the the two former, the first cost of the 18-inch pipe will be over $2 per foot less than the 24-inch main. The 18-inch main will be sufficient for probably 12 years or more, and the saving of interest on this difference will more than compensate for the difference in first cost. When it shall become necessary to have the second main this plan will be useful in other respects. In case of repairs on one of the lines of pipes the other will secure the supply in the meantime and an important advantage will be thereby gained at no increase, as has been shown, in the ultimate cost."

In his report of January, 1856, Mr. Keefer had provided an average supply of 50 gallons per head; this has now been reached. The quantity pumped in August last being about 58,000,000 gallons, nearly 14,000,000 gallons per week for a population of 35,000.

Instead of 1,500,000 gallons now being forced daily through the 18-inch main, there are days and weeks in which over 2,000,000 gallons per diem are sent forward. The average supply estimated by the consulting engineers has long since been exceeded, and this has been found to be the experience of almost every other city, in some of which, as shown by the table below, the rate has exceeded 100 gallons per head per diem, at least one half of which is no doubt wasted. The probabilities of future increase in your consumption can best be estimated from the following table: