To get the total cost of maintenance, we must include with the operating expenses the charges for interest and sinking funds. This will of course depend upon the cost of construction; and the latter will vary with the maximum rate of filtration adopted, and the proportion of the total area to be out of use while being cleaned. These being decided upon, it will then be easy to calculate the first cost per million gallons of daily yield. For example, if, with the rate chosen, the daily yield of the plant will be 2 million gallons per acre of the total area of beds, the first cost per million gallons will be half the cost of construction per acre, and so on. The diagram gives the cost per million gallons filtered, corresponding to different construction costs, which will pay the interest and sinking fund charges necessary to cancel the whole first cost with interest at the end of 40 years.

For example, with a first cost of $60,000 per acre, and a net yield of 2 million gallons per acre of total area, the cost per million gallons with interest at 4 per cent. would be $4.15.

The amounts taken from the diagrams added to the estimated cost of operation will give the total cost of maintenance per million gallons of water filtered. With interest at 4½ per cent. and a first cost of $80,000 per acre, this would amount to about $6. Add to this $2.50, for the expense of operation and we should have $8.50 as the total cost of filtering 1 million gallons of water, or 1,000 gallons for less than $\frac{1}{10}$ of a cent. With open filters, or more favourable local conditions, this charge would be considerably reduced.

Having now discussed the method and cost of sand filtration, the next and last question to be considered is the nature of the results which this process can be depended upon to produce. There can be no question as to its efficiency from an æsthetic point of view. The complete removal of even the most minute particles in suspension, together with a large part of the dissolved organic matter, ensures the entire elimination of any characteristics the water may possess which would be disagreeable to sight, taste or smell. Yet it is because of the effectiveness of the purification from a sanitary standpoint that this system is especially noted. This is due, as we have seen, to its destructive effect upon the bacteria, which is almost sufficient to cause their entire disappearance during the passage of the water through the filter. The average reduction in a well designed and well managed plant will be as great as 98 or 99 per cent., as shown by comparing the number of germs in the effluent with that in the applied water. But in reality it is even greater than this. For