

water progressively deteriorates after it has become clear by sedimentation. The bacteria increase at the expense of the organic matters which they destroy. A water which every chemist and every bacteriologist would pronounce a fair sample of potable water will be found, after a week of storage, to be swarming with bacteria. Daily experience forbids the condemnation of a good water merely because it has been stored for a week; yet the bacterial colonies that may be developed from it are infinitely more numerous than those that are found in a water which is impure even to the senses. Indeed, the bacteria in an ordinarily pure water, after storage, may be vastly more numerous than in another portion of the same water intentionally contaminated with sewage or other impurity and similarly stored for the same length of time. This it is which deprives the bacterial cultivations of that value which but a short time ago they were expected to develop as indices of the wholesomeness or unwholesomeness of a water. A chemical evidence demonstrating a tendency to purification by the conversion of organic matter into nitrates, through the instrumentality of bacterial organisms, is more consistent with everyday observation than the bacteriological evidence which suggests unwholesomeness by demonstrating the numbers of the bacteria.

But although the general tendency is to the reduction of organic matter in stored waters, it often happens, particularly if the water is rich in ammonia or easily decomposed albuminoids, that vegetable growths other than bacteria will be developed, giving a bad taste or odor to the water, and perhaps causing diarrhoea in the consumers. These, which may be considered the accidents of storage, have been studied by many health boards and water companies; and the influence of heat, aeration, exposure to sunlight, etc., on their development, has been determined with practical benefit in many cases.

Sedimentation is sometimes an exceedingly slow process, particularly when the mineral particles consist of finely divided clay. A week or more is required in some instances to give a clear water, and this

involves a large expenditure for storage-basins. Hence, many have turned their thoughts to filtration as a prompt and efficient means of purification. Filtering-beds are in general use in England, but in this country they have been constructed only by a few cities, and in an experimental way. The results do not appear to have been satisfactory. The expenses attending them are large, and the coldness of our winters begets difficulties which have not to be encountered in the milder climate of England.

But the failure of filtration on the large scale, and the imperfect results of sedimentation as carried on in the reservoirs, have given an impetus to the construction of filters for domestic use; and the success which has attended attempts to supply a clear water to manufactories; and other large establishments has gradually led to more ambitious efforts. Of late some municipalities have investigated the means by which this filtration is effected; and the ability of the filters to supply a clear water on the large scale appears to have been demonstrated. As the method is patented, a certain hesitancy has been manifested by members of the Association in referring to it; but, patented, or not patented, if it have a value above others in supplying a pure water, we should have full accounts from such of our members as have a practical knowledge of its operations in all their aspects. A member of the American Water-Works Association did not hesitate, at its last meeting, to invite attention to the success achieved at Atlanta, Ga. He expressed himself as knowing but little of the chemical improvement that took place in the quality of the water, but so far as the mechanical results of the filtration were concerned he was perfectly satisfied. The surface of the water in the impounding reservoir is nineteen feet above the layer of coke and sand which constitutes the filter-bed, through which it is carried by gravity into the clear-water basin. The reservoir water is generally so muddy from red clay and other suspended impurities that it is rarely fit for bathing or laundry uses; yet in the clear-water basin small objects may be plainly seen, through it at a distance