periods of its exposure it is capable, if uncared for, of presenting an unpleasant appearance and provoking adverse criticism; with the further objection that heavy weed growth may develop if it be long uncovered, which growth will contribute toward the production of taste and smell when the water again covers it.

In an instance where it was proposed to restore a dam that had been out of repair for over fifty years the writer advocated the cutting off of the standing dead timber at the existing water level before closing the breach, in order to insure a better looking sheet of water when the reservoir filled. This was for appearances only, as all extractive matter had been leached out of the old vegetation long before.

Aëration, filtration, and the judicious, occasional use of copper sulphate constitute the processes at our disposal for combating the annoyance arising from algal growths, and their use will give greater satisfaction than the expensive stripping of reservoir bottoms, a treatment which was so frequently advocated in the past.

Dr. A. C. Houston, of the London Metropolitan Water Board, has undertaken some very extended researches upon the question of water purification as a result of storage. He found that in stored Thames water the death of typhoid bacteria took place rapidly, although the rate varied with the temperature of the water. In cold water they lived longer than in warm, and 50° F. seemed to be a critical point above which their mortality rate was much increased.

In his 7th Research Report, Houston states that typhoid bacilli lived in stored raw Thames water for the following lengths of time: At 32° F., five weeks; at 41° F., four weeks; at 50° F, three weeks; at 64° F., two weeks.

Even these figures do not tell the entire story. Put in more detail they read:

	At start.	One week.	Two weeks.	Three weeks.	Four weeks.	Five weeks.
32° F.	103,328	47,766	980	65	34	3
41° F.	103,328	14,894	26	6	3	—
50° F.	103,328	69	14	3	—	—
64° F.	103,328	39	3	—	—	—

He concludes: "It is difficult to escape the belief that thirty days' storage of river water is tantamount to sterilization, so far as the microbes associated with water-borne epidemic disease are concerned."

When experimenting with an artificially infected water to determine the effect of storage upon the typhoid bacillus, Dr. Houston felt that any error so introduced was upon the side of safety, because he had previously shown the "cultivated" typhoid organism to have a greater longevity than the "natural" *Bacillus typhosus*. In his report he dwells at length upon the advantages to be derived from "adequately storing the *raw* impure river waters." Even if there were no economic reason for storing a river water before rather than after filtration, yet it would be well to follow that course, aside from any question of algal growths, for the reason that sedimenting silt greatly assists in bacterial removal. Placing the word "raw" in italics was, therefore, a matter of good judgment.

Dr. Houston adds: "I am well satisfied that a well-stored, rapidly filtered water is likely to be safer than an unstored, slowly filtered water."

It is possible to go even further than this, for one can see how dangerous it might be to deliver, directly to the consumers, the water of a small and apparently pure mountain stream. The dejecta of a single typhoid carrier would render so small a volume of water highly infectious, if no storage intervened, and an outbreak might follow, such as occurred at Plymouth.

Although Dr. Houston is doubtless sound in his judgment that a great measure of safety will result from four weeks' reservoir storage of a polluted water, yet we must be assured that the period of storage is real and not simply apparent; or, in other words, we must know that *all* of the water really does remain in the reservoir for the specified length of time before it is used for public consumption.

Where the inlet and outlet of a reservoir are near together, as is not uncommonly the case, it makes but little difference what the capacity of the total storage may be; the water simply slips in and out again with practically as little stay as though the reservoir was a standpipe.

If the lake be long, narrow and deep, and all of its water be obliged to traverse its entire length before being taken for supply, then the conditions would appear ideal for purification of the inflowing water before the outlet was reached, and yet even under those excellent conditions it is possible to have introduced unexpected and upsetting factors, as is instanced by the history of the typhoid epidemic at Auburn, N.Y.

Lake Owasco is one of the so-called "finger lakes" of western New York. Its length is about ten miles, breadth one mile; its watershed is about 190 square miles, and its depth is about 175 feet. A small stream enters its head, and Auburn, a city of some 30,000 inhabitants, has an intake located at the north end or foot of the lake and forty feet below the surface. The temperature of the water at that point in May, 1913, I found to be 42° F.

The peculiar feature of the case which has special interest here is the possibility of polluting material of fecal character being transported from a village near the head of the lake, down the inlet stream, and then northward for the entire ten miles of the lake's length to the Auburn intake situated near the lake outlet.

We have all faithfully held to the dictum that "sedimentation and time" are the great purifying agencies upon which to rely for the natural improvement of a once polluted water; and it takes a good deal of evidence to persuade us that sewage of a small village could make the trip down such a lake in a length of time and in such a manner as to dangerously affect the water of the lower end. Experimental data, however, have been secured showing that such a result can actually take place. Investigation showed the following facts: The village sewage was, of course, small in volume, but during the winter months it was deposited at several points upon the banks of the inlet stream and there it collected in a more or less frozen condition until the occurrence of the spring thaw, at which time there was opportunity for much accumulated fecal material to be washed into the lake in a state of suspension. There was also a chance of its being actually ferried upon cakes of ice, for the reason that certain privies were located upon bridges and fecal matter was dropped upon the very centre of the ice-covered stream.

As stated, the shape of the lake is long and narrow and its axis lies north and south. It must be further noted that the prevailing wind is from the south, with a tendency to blow the surface water directly toward the city intake at the north end.

By means of triangulation and the use of floats constructed so as to be moved by water currents existing at the different depths of from five to twenty feet, it was ascertained that the upper strata of water moved northward with the wind, as would have been expected. The