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CHLORINE TREATMENT A BOON, NOT A MENACE

IN the March issue of *Conservation*, the official publication of the Commission of Conservation, Ottawa, there is an anonymous article that carries the following heading: "Chlorine Treatment Temporary Measure. Defects in the System Render it a Constant Danger to Public Health."

The article refers to water-sterilization as a temporary measure, claims that "expert opinion" has asserted that the chlorination of a contaminated water supply should never be adopted as a permanent policy, and urges that every community should earnestly endeavor to obtain a pure water supply either "directly" or by means of filtration.

Up-to-date sanitary engineering theories are not in accord with *Conservation's* theory that chlorination is merely a temporary measure and that it can be entirely supplanted by filtration. As has been pointed out by the chlorinating companies themselves, filters are unquestionably the first line of defence; and on the other hand, the filter-manufacturing companies welcome sterilization as a valuable and permanent ally in the purification of water supplies.

No manufacturer of filter plants can guarantee 100% bacterial efficiency. Under certain conditions he will guarantee to remove possibly from 94 to 98% of the bacteria in the raw water, but for the remainder of the work of obtaining absolutely sterile water, one must resort to sterilization of some kind. Dirty water cannot be so successfully chlorinated as clean water; chlorine will not kill all the germs in a polluted supply unless the water be filtered before chlorination. Sterilization will not supplant filtration, but sterilization picks up the work where filtration leaves off, and the two go hand in hand.

A combination of filtration and sterilization is the one really safe way of obtaining a pure water supply in populated districts unless a city or town be peculiarly well situated in regard to artesian wells of unimpeachable character.

The character of many wells is not unimpeachable; the water they yield sometimes needs filtration and sterilization as urgently as do some surface supplies.

Another aspect of sterilization as a permanent aid to filtration, is the economic one. It is sometimes very much cheaper to operate a filtration plant, at, say, 92% efficiency than at 98%, and the former efficiency may be sufficiently satisfactory to permit some sterilizing process to kill all of the remaining pathogenic bacteria.

The above-mentioned article in *Conservation* speaks of "the inherent defects" of chlorination coming to light in the United States. Just two instances are cited by *Conservation* as proving these defects,—one at Milwaukee, Wisconsin, and the other at Xenia, Ohio. At Milwaukee so many citizens complained that they could taste chlorine in the water, that an employe at the pumping station took it upon himself to eliminate the chlorine treatment for a 12-hour period. Surely that is not an inherent defect in chlorination! What would happen if a filtration plant operator were to by-pass his raw water and cut out the beds for twelve hours? No sanitary system is foolproof. Any method of purification of water supplies is likely to show "inherent defects" if its operation be left to an ivory-headed idiot.

"At Xenia," says *Conservation*, "a small typhoid epidemic was started recently owing to the inferior quality of the chlorine powder used in the water supply." That is quite true, but it shows no inherent defect in chlorination as now practiced among all up-to-date municipalities. Note the words "chlorine powder." Ordinary bleaching powder, or hypochlorite decreases in strength from day to day. Its chlorine content can never be known without analysis. It is admittedly unreliable in the hands of an operator of a small plant such as one would find at Xenia, an operator who must "carry on" without the aids of daily laboratory tests and expert advice. This defect, however, is totally eliminated by the use of liquid chlorine, which is always of constant purity and quality and which can safely be left in the care of any operator of average intelligence who appreciates the responsibility of his position.

In a recent issue of *Conservation*, L. G. Denis, a member of the technical staff of the Commission of Conservation, pointed out that all attendants of water filtration or sewage treatment plants should be licensed. "These operators," says Mr. Denis, "have in their hands the lives of the population served practically to the same degree as a locomotive driver and more so than a boiler stoker. Why not have them also licensed?" Such a system of licensing no doubt would obviate incidents such as experienced at Milwaukee, as the examination that the operator would be required to pass could be made sufficiently drastic to impress the man with a sense of his responsibilities. The examination would also tend to reveal the mental deficiencies of an operator who would permit polluted water to enter a city's mains because some imaginative citizens "tasted" chlorine.

The tasting of chlorine in water is the favorite indoor sport of all towns where chlorination is an innovation. Innumerable and amusing anecdotes are related in this connection. In one eastern Ontario town, the chlorinating apparatus had arrived and was installed in the pumping station. Word to this effect spread through the town and the people presumed that the water was being chlorinated. Immediately a deluge of protests was received at the town hall. Scores of telephone calls insisted that the water was simply undrinkable on account of the chlorine. As a matter of fact, the drums containing the chlorine gas had not yet arrived and not an ounce of chemical of any kind was passing through the apparatus.

In another well-known municipality, when chlorination was first started there was similar complaint. The municipality's engineer effectually silenced much of this criticism to the satisfaction of the other city officials by inviting a considerable number of complainants to meet him at the pumping station. Upon a table he placed a large number of glasses of water, each glass labeled and numbered. Some of the glasses contained water that had been chlorinated, and some contained water taken from the main before chlorination. The engineer invited the various complainants