

If all supplies do not measure up to this standard, the regulation works an injustice on a few supplies, and does not accomplish a general improvement in the water supplies of the country, as might otherwise be the case.

If there are two towns, located one on either side of the state boundary, designated as A and B, A being a watering place for railroad equipment, and B being a way-station, according to existing legislation, the supply of A must conform to the Treasury standard, and the supply of B can be anything that the state and local officials will permit. To make the water supply of A conform to the standards, has, in all probability, placed a burden either on the water company or the taxpayers of the municipality, and has correspondingly improved the welfare of the town. Is it equitable to require A to go to this expense and not to impose a similar obligation on B? On the other hand, in justice to the consumers at B, should they not be afforded the same protection as those at A?

It is appreciated that in suggesting the feasibility of adopting tentative minimum bacteriological standards, that the principal objection to such procedure is the inability properly to consider the sanitary surroundings of the source of the water.

The abundant good that has been accomplished on a relatively few supplies, following the establishment of Treasury standards, however, would indicate that a considerably greater number of supplies could be improved, should minimum standards be promulgated for all of them.

Whether or not we are governed by arbitrary or tentative standards, more or less definitely fixed, those who in the course of their work are called upon to interpret large numbers of bacteriological analyses, unquestionably are governed by standards that they have set, upon which the interpretation is based, and this interpretation is made, first, without reference to a sanitary survey; and, secondly, in conjunction with a sanitary survey to determine, if possible, the sources of any apparent pollution. But these personally established water standards vary with the individual's interpretation of the analyses.

A water showing coli in 1/10 c.c. regularly will unquestionably be condemned, as would also, without doubt, a supply usually showing coli in 1 c.c.

A water showing coli frequently in 5 c.c., and occasionally in 1 c.c., would very likely be rejected by most sanitarians, although the frequency with which such supplies are furnished to consumers, without rigorous steps being taken to improve the quality, is surprising.

When we reach a water, however, with coli present frequently in 10 c.c. quantities, and occasionally in smaller amounts, the interpretation of the analysis lies very largely with the individual, and may be rejected or passed, in accordance with the individual's standards.

Although the difficulties of arbitrarily establishing any minimum bacteriological standard are appreciated fully, it would tend greatly to improve the quality of a great number of supplies, if minimum standards adopted after careful investigation, were to be officially promulgated by this association.

Should such standards be available for water companies, commissioners, and consumers, a definite object would be established, and the best results in any line of endeavor are secured only when a definite objective is in view.

On the other hand, should such minimum standards be established, being intelligently drawn, and formed only after due consideration of geographical conditions, they would unquestionably aid the supervising health officials

in dealing with the recalcitrant water vendor, for the state sanitary engineer would have a definite objective that he could order the vendor to reach.

Although the United States Treasury standards are high, as compared to many water supplies in this country, and although a large number of waters of our bigger and better-known cities would not at all times conform to the Treasury standard, it is not high as compared to the standards existing in European countries and Great Britain.

It was expected that a considerable fund of authenticated information would be available to incorporate in this article to cover standards prevailing in these countries, and the limits of bacteriological content that are considered good practice. Presumably, this information has been lost in transit and will have to be incorporated subsequently. Many English waterworks men, however, contend that the total bacteriological content after 24 hours' incubation at 37° C. should not be more than 50 per c.c., and that colon should be absent in 100 c.c. quantities after 72 hours' incubation at 37° C., and some even go as far as to aim to have colon absent in 200 c.c. after 72 hours' incubation at 37° C.

An examination of the "Twelfth Research Report of the Metropolitan Water Board," of London, would indicate that the settled, stored and treated waters of various supplies before filtration, were comparable bacteriologically with some of our American water supplies as delivered to the consumer.

In advocating the adoption of minimum bacteriological standards of water, the object in view would be to improve the poorer supplies, and to establish a guide by which non-technical waterworks men could appraise their supplies. To establish standards not so much as an arbitrary means of appraisal as an incentive to secure better water supplies.

It is therefore suggested that consideration be given to the appointment of a sub-committee to determine the practicability of adopting standards similar to the U.S. Treasury standards for all waterworks, whether they be used for interstate traffic, or not.

**Non-technical Standards.**—Technical standards are easily explained in scientific terms intelligent to those familiar with their use. Non-technical standards are more difficult to explain, but may be defined as the attitude of the non-technical man toward a water used for domestic purposes. These may well be divided into two classes:—

- (1) The standards of the non-technical waterworks man.
- (2) The standards of the consumer.

It must be realized that there are a very vast number of waterworks men in this country, not members of this association, who do not know to any extent the necessity of a pure water supply, and to whom the colon bacillus and bacterial flora in general are unknown. Fortunately, the number of waterworks in charge of this type of man is fast diminishing.

The only reason that so many non-technical waterworks men are entirely unfamiliar with the need of safe water, and the care and vigilance that must be used to secure a safe supply, is that they do not know the fundamental reasons for a safe supply.

Two instances are worthy of mention:—

A certain surface water supply in New England upon investigation, following a typhoid epidemic, was almost definitely found to have been polluted by a typhoid carrier hunter. The State Board of Health representative, sent to install a temporary treatment plant, was ordered out