WATER PURIFICATION IN WAR TIME*

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IT is vitally important that the health and well-being of our body politic shall be promoted to the utmost during these days of supreme trial, for while those who go to battle are the bulwarks behind which we hope to live on in liberty, in happiness and in peace, upon our national prosperity must those who fight our physical battles depend. We must grow more food; our industries must produce more and better goods; our natural resources must be drawn upon to a greater extent than ever before; our inventive minds must be developed, sharpened and whipped to greater accomplishments. In this way we who remain behind the battle-fronts may best help those who risk their all for us, and we can fulfil our duty best when we care for our health, that the results of our endeavors may be a fair measure of our maximum abilities.

What part in the conservation of the public health is played by water purification? A big one; a tremendously big one.

The vast majority consume their drinking water without a thought of whether it is pure or impure, but more or less unconsciously fulfil a natural impulse for moist refreshment to repair the depleted mucous membranes, and as an occasional liquid piston to force sundry bites of solid food into the stomach.

Water is something we all must have. When we discover goods which do not agree with us we eliminate them from our menus, sometimes, but pure water has no effect but for good on anyone. Impure food touches only a part of a community. Impure water reaches all. Impure foods ofttimes bear sensible red flags of danger which warn the prospective consumer against them, but impure water may be served in the guise of cleanliness, and in its crystal, wholesome appearance be consumed with entire confidence and still be heavily charged with the harbingers of disease and death.

Our forefathers obtained their drinking water supplies from shallow wells and springs, as many communities do to-day. Only as a last resort did they go to the nearest stream. This was not because they thought the waters from such sources were dangerous—for they knew nothing of the typhoid germ; in fact, none of us knew anything about it thirty years ago—but for the far simpler reason that spring and well waters usually are not only clear, but cool.

As communities grew in size such primitive water-works as had sufficed in the past were outgrown, and the public waters, lakes, ponds and rivers were drawn upon more largely. There was enough typhoid in those days, anyway, which came from other sources, but with the more general use of contaminated public waters sharp and widespread epidemics of typhoid fever occurred, and the score of endemic typhoid was greatly enlarged. As the population increased these waters received more and more pollution, but the germ theory of disease had not yet been established and the public paid a heavy debt to convenience in water-borne disease.

Slowly but surely people began to realize that rapid growth in population could only be followed by a corresponding increase in the pollution of the lakes and rivers of the country from which the bulk of public water supplies are drawn. With increasing pollution of the public water supplies must come increasing sickness and death unless those supplies are purified before use. And so the practice of filtering the water supplies of our cities and towns began to grow rapidly, the decision to adopt filtration being hastened by the increasing death toll from that commonest of water-borne diseases, typhoid fever, and by the profitable example of such communities as were wise enough to adopt filtration, and thereafter show a marked minimization in their death rates from water-borne diseases.

There is, of course, no precise way in which the influence of municipal water purification on the public health can be shown. Analogical reasoning, based upon the proportion of our population using filtered water and the typhoid fever death rates in different periods, gives us a pretty firm footing for the statement that water purification has been the most potent agency in cutting down the tremendously high typhoid toll of years ago to the fairly reasonable figure which exists to-day. We know that the introduction of water filters in a city whose water supply is polluted will reduce the death rate from typhoid fever by close to 75 per cent. We also know that for every death from typhoid fever thus saved at least two deaths from other causes are avoided. The records are plain on these points.

Water purification works, well-built and efficiently operated serve as an infallible prophylactic against water-borne disease. In war time, they are more than ever necessary, yet the high cost of labor and building materials, ranging from 50 to 150 per cent. in excess of the normal, seems to dull the minds of some city officials to their need. Pure water is always worth far more than was ever paid for it. Before the war the average cost of furnishing filtered water in large and small cities was about 40 cents per capita per annum. Let us say, for the sake of argument, that it is now $1. In a city of 100,000 population it is necessary to save but seven lives from typhoid fever, and the some fourteen other lives that are coincidently saved from death from other causes, in order to break even on the cost of pure water.

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The output of coal in France during the first half of this year was 13,105,019 metric tons, as against 10,626,544 tons last year. The monthly output will probably soon reach 2½ million tons, which will make this year's output rise to about 28 million tons, as against about 20 million tons last year. About 40 per cent. of the total output has been produced in the Pas-de-Calais.

The production of finished steel in Great Britain in 1916 is reported by the Iron and Steel Federation as follows:—Bloom, billets and rods, 1,945,000; sheet bars, 1,272,000; rails, 271,000; plates, 1,153,000; sheets, 78,000; shapes and angles, 757,000; beams and girders, 346,000; galvanized sheets, 132,000; tin plates, 577,000; total, 6,531,000 gross tons. The production of steel castings was 207,000 tons, of which 18,000 tons were made in electric furnaces. The production of wrought iron was 960,000 tons.

In connection with the recent celebration of the four hundred and twentieth anniversary of the discovery of Newfoundland, it may be observed that this country's railway system starts at St. Johns, and proceeds due north, parallel with the western coast, and then turns south-west and ends at Port aux Basques, a distance of 546 miles. In 1875 a survey was made for a more direct railway between these points which would have reduced the distance to about 300 miles. From Port aux Basques to Sydney, at the head of the railway system in Cape Breton, the distance is 103 miles. From Port aux Basques to Aspey, in the north-west corner of Cape Breton, but without railway accommodation, the distance is but 67 miles. Across Canso Straits, from the southern end of Cape Breton to Nova Scotia, there is a train ferry.