

PRESENT STAGE OF SCIENTIFIC WATER SUPPLY IN AMERICA

REPORT OF AMERICAN SOCIETY FOR MUNICIPAL IMPROVEMENTS'
COMMITTEE ON WATER WORKS AND WATER SUPPLY—PRESENTED
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IN looking over the legislation of the past year and the greater amount of knowledge on water supply displayed by the press, it must be confessed that the different States and municipalities have not been developing their laws for the proper protection of the people from contamination of water supplies as rapidly as is considered necessary: This has been due principally to the ignorance of the average legislator, and sometimes the political pressure brought to bear upon him from interested sources.

Legislation in Minnesota.—In Minnesota a bill was placed before the State Legislature for adequate protection of the water supply throughout the State. This bill provided that all persons, corporations, and municipalities, other than first class cities, supplying water for private or public consumption within the State must file with the State Board of Health certified copies of plans of their water supply, and that no such source of water supply shall be used until plans have been placed before the State Board of Health and favorably considered. This also applies to new places for the disposal of sewage. This State approval would have been a step in the right direction, and Minnesota, following in the steps of New York, New Jersey, Pennsylvania, Massachusetts, Ohio, and the Province of Ontario, but unfortunately the opposition was so strong that the bill was withdrawn.

Water Waste.—In Philadelphia water is still wasted, and its water system is now heavily overworked, with the result that in attempting to keep up with this waste the quality of the water, along with efficiency and economy in operation, have been sacrificed for the sake of quantity, and the present filters are being worked at a higher rate of filtration than is thought advisable, or that would be necessary under normal restrictions. This applies to other cities also, and the public seem very slow in awakening to the tremendous unnecessary expense, although brought to the fore by probably every manager of municipal waterworks in the country, and every advance made to curtail the water to reasonable limits is only gained after hard and very often bitter opposition.

In New York it was found that 33,500,000,000 gallons of water were saved at a total expense of \$138,000.00 by careful house-to-house inspections, which amount was ascertained after careful pitometer gaugings before and after district inspections.

Pollution of Lake Erie.—During the spring a conference was held at Cleveland between the Ohio State Board of Health and representatives from cities on the south side of the lake to discuss the sewage pollution of Lake Erie, and it was thought probable that there was no general pollution of that lake, and that any pollution was confined to zones within limited distances of cities and rivers contributing sewage. It was also brought out that the sewage from any particular city was more detrimental in its effect upon its water supply if taken

from the lake than upon that of any other city, taken from the lake, and that water supplies taken from limited distances from the shore should be purified. At this meeting a resolution was adopted asking the State Board of Ohio to investigate the degree and extent of the pollution of Lake Erie, and also a resolution was adopted providing for the appointment of a committee to fix standard methods of analysis of samples and the nature of the determinations to be made in the investigation.

Commenting on this, we may say that, while the pollution would generally be within limited distance of cities and rivers, yet there are authentic cases on these great lakes where islands of polluted water have been found fourteen miles distant under certain weather conditions, which, however, are not common.

Analysis.—In the chemical and bacteriological determination for the purity of water the procedure originally developed by the Massachusetts State Board of Health has almost universally been followed. That analyses estimate the amount of chlorine, nitrates, nitrites, oxygen consumed, oxygen dissolved, odor, turbidity, hardness and sediment, along with bacteria count and tests for B. Coli; yet it has recently been pointed out by Dr. H. E. Barnard, chemist of the Indiana State Board of Health, that in many tests made the values for chlorine, nitrates and nitrites under varying conditions are of little value. For instance, the nitrite factor, of considerable value in the determination of well supplies, is of little value in rivers or lakes, varying more widely during conditions of low and high water than of varying amounts of sewage inflow. The same remarks apply to the presence of free ammonia. It was found, however, that two factors of oxygen consumed and dissolved were of prime importance, although they varied also in rivers somewhat according to the variable flow and by turbidity. However, the determination of these two factors, with the bacterial count and test for colon bacillus, is of great benefit in ascertaining the purity of a water supply at the time the tests were taken; but to be of prime value there should be a large number of tests extending over different conditions of the river or lake, for no chemist can definitely say that any water supply is good or bad upon the result of isolated tests, and without knowing the local conditions and surroundings at the time the samples were taken. We have dwelt on this because of the almost universal idea held that one determination of a water supply is quite sufficient, and of the habit of some chemists of approving or condemning a supply upon such a test and without a knowledge of the locality from which the samples were taken.

In looking over the typhoid statistics of some fifty large American cities a considerable decrease has been noticed, there being only twelve cities in this list where the rate has been greater than last year. This is due, no doubt, to the betterment of the water supplies and the general improvement in sanitary conditions.