

water which is even slightly turbid, except in emergencies when nothing better is offered.

Iron Objectionable

Iron is objectionable in a water supply because it precipitates on standing, stains bath-room fixtures and white clothes, and tends to favor the growth of the iron-secreting organism *crenothrix*. This organism may grow so luxuriantly in the mains as to clog them. Iron is usually removed by filtration after precipitation by aeration or treatment with lime. Manganese, which sometimes accompanies iron, gives rise to similar difficulties. It is more difficult of removal. There is nothing definitely known which would lead us to believe that the mineral substances ordinarily found in our streams and wells are not healthful. A soft water may be preferred for drinking by many people; it is certainly more pleasant for washing purposes and more economical for industrial purposes, but there is no good reason to believe that it is necessarily more healthful for the normal individual than our ordinarily hard waters. It is the bacterial condition of the public water supply which is of the greatest importance from the health officer's viewpoint. He should know what the bacterial condition of the water really is. In cities and towns depending on the untreated water of wells for their supplies, changes in the quality of a water should be very slow. At times of unusually low water, or at times when a change in the character of the supply is apparent, examination of the water should be made, even though the water is examined at regular intervals once or twice a year. Where treated water supplies are used, it should be remembered that there may be considerable variation in the output of the plant from day to day. The operation is most likely to be unsatisfactory in the winter or in the very early spring. A turbid water coming from a water plant is usually a sign of improper operation, although it may be due to an after precipitation of iron. The chlorination process will not properly act on such water and the bacterial count is usually high. The cause will often be found to be cracks in a packed sand bed, insufficient chemicals or too little sedimentation.

Examination of Water Supplies

And now a few words with regard to the examination of water supplies as conducted by the Iowa State Board of Health Laboratories: All our work is directed toward an attempt to determine whether the water is contaminated or not, and if contaminated, whether or not the contamination is from sewage or sewage-like material. Of course, sewage is very likely to contain at any time the specific organisms of typhoid fever and similar diseases. If the bacteria of the disease are deposited in the water by a carrier or in the excreta from a case of the disease, the disease may be reproduced and an epidemic follow. We do not look for the typhoid organism itself, because it has not been found practical to do so. The organisms might die out before we received the sample of water, for one thing. Instead of looking for the typhoid bacillus we look for the colon bacillus, which is constantly present in the excreta of man and the warm-blooded animals.

Our chemical work we regard as subordinate to our bacteriological findings. The chemical substances determined are none of them important for their toxic actions in the quantities ordinarily present in contaminated waters. They aid us in forming an opinion of the history of the water, the density of the contamination and its source. In the chemical examination, most of the emphasis is put upon the determination of nitrogen in its various forms, because it happens that nitrogen is one of the substances

most commonly present in organic matter. The albuminoid ammonia determination is intended to give us some notion of the amount of undecomposed organic matter present. Chlorine—by which we mean the combined chlorine of common salt and calcium and magnesium chlorides—may come from the soil or it may come from urine, and other wastes. If the nitrogen forms are high and chlorine is low, it may be said that in all probability the organic matter is the product of vegetable decay, while if chlorine is also high, the presence of decaying animal matter is indicated. In all cases where the collection of the sample is not made by a member of the staff, we must assume that the sample was collected and forwarded to us in the manner directed. We have carefully prepared a set of instructions which appear on our data sheet, but we know that sometimes they are neglected or not even read. Any contamination which is introduced will be to the disadvantage of the supply. In extreme cases it might even be erroneously condemned. Whenever we are led to believe that the sample has been accidentally contaminated, we explain this matter and request another sample for a re-examination. In a few States the ideal method of collection of samples by agents of the laboratory and sometimes plating in the field is practiced. The expense involved has prevented us from adopting this procedure, since the cost of collecting a single sample is considerable. Most of our communities were originally supplied with water by means of private wells, many of which remain in use at the present time or have been replaced by new wells, usually of the bored and driven types. Quite often an owner or a new tenant will have doubt as to the safety of one of these private wells. When convenient, the health officer can make a personal inspection of the well and its surroundings, and, if found advisable, an analysis may be recommended. Most board of health laboratories are glad to make examinations of private water supplies on the same basis as those for public use. It is recognized that an epidemic involving the neighborhood or even the entire community might have its origin in one of these private wells.

STREET CLEANING IN MONTREAL

"Far from satisfactory," says the Bureau of Municipal Research in its report to the Board of Control of Montreal, in commenting upon the results obtained by the street cleaning methods in vogue in that city. "This is due," claims the Bureau, "to the unpaved condition of many lanes and streets in the city, to the deplorable condition of a large part of the paved thoroughfares, and to the inadequate forces and equipment provided for street cleaning work."

"It is recognized that, during the period of the war, it may be advisable for the city to get along without spending more for street cleaning, but the following suggestions, if adopted, would promote cleaner streets without additional cost:

"Motor equipment, including flushers and the machine brooms recently purchased by the city, have developed certain defects that must be corrected. In particular, the larger machine brooms are ill-adapted for conditions in Montreal. These difficulties would indicate an error in judgment on the part of those ordering the above equipment, together with inadequate specifications that should be guarded against in the future. The more extensive use is advised of flushing methods in street cleaning and suitable equipment provided. The corporation of the tramways company should be ordered to extend the use of flushers."