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FOR THE CANADIAN ENGINEER

WATER SUPPLIES.

BY W. M. WATSON.

(Continued from last issue.)

The need of sufficient water pressure is often a danger to the public health. Last September I was staying at a prominent hotel in one of our great cities, and while on the top flat I heard the water closet cistern (a noiseless syphon flushing cistern) syphon the water out of the cistern back into the town supply service. On examination I found that the pressure was so poor that when they drew water at a lower flat the water was sucked out of the closet cistern and drawn out of the taps below. This was very serious for the health of the household, because there would be a passage of the foul gases contained in the closet bowl upward, through the flushing pipe, and into the flushing cistern when syphoned empty, and when the cistern was refilled with water it would be fouled by these gases, and if they happened to draw the water again at the lower rooms before the w.c. was used they would be receiving poisoned fluid. A similar case occurred at the Caius College, Cambridge, where a violent and disastrous outbreak of typhoid fever occurred because one of the water closets that was flushed by a dangerous old fashioned stool tap, out of repair, and not having sufficient hydraulic pressure behind it from the water mains, allowed the

contents of the water closet bowl to be sucked back into the service pipe and delivered to the kitchen.

At Mountain Ash, in Glamorganshire, the people were struck with an epidemic of typhoid, and Mr. Spears proved it to be caused by a water main being laid for a long length alongside a very foul old stone sewage drain, and the poisonous gases had been attracted through the walls of the iron-pipe main into the motionless water when there was no one drawing. When the main was removed out of the way of the sewer the outbreak diminished and has since not occurred again. (See health reports of Great Britain for 1887.) In an English manufacturing town I examined about fifty sets of steam boilers, which were supplied direct from the town's water mains and found only about twenty per cent. that were supplied with proper valves and other appliance in sufficiently good working condition to prevent the fluid from the steam boilers leaking back from the boilers to the water mains when the steam pressure in the boilers was higher than the water pressure in the mains, and sometimes the ingredients used to prevent the boilers scaling could be tasted in the water drawn at the taps of the houses situated in the immediate neighborhood.

The insuction of polluted water and foul gases into water supply mains of towns, and the illnesses caused therefrom, does not receive the attention it should, for it is of little use securing good water at the intake if it becomes contaminated after entering the town supply pipes.

But the intake end of the service should also be watched, because what sometimes seems a very trivial affair turns out to be serious. In 1892 a number of Russian Jews from the cholera stricken districts of Russia squatted on the quays of the river Elbe and the sewage from them was washed up by the tide to the mouth of the intake pipe that supplied the city of Hamburg with water, and in the space of eighty days 18,000 persons were attacked with cholera and 8,000 died from the complaint. (See Professor A. Koch's report).

During a general heavy rain or thaw of thick snow the face of the earth is washed and its impurities, coupled with the ejecta from men, animals, and birds, together with every description of decayed and putrefactive matter, is discharged into the rivers, making the waters they are carrying away totally unfit for domestic consumption for probably a whole week, and this makes it almost imperative for towns who draw their supply from drainage rivers to have a reservoir accommodation to hold over one week's supply, so that the river supply may be dispensed with during such periods, or else they should be provided with good filters.

There is a purifying advantage in storing water in reservoirs, for water allowed to rest in reservoirs for a few days improves considerably in quality if the reservoir is clean. It seems to go through a process of mild fermentation, and the friendly cleansing microbes feed on the injurious germs that the water may contain. No doubt a similar purifying process goes on in slow moving rivers, probably in a rather less degree, but it cannot be expected that the germs cast off by diseased persons and putrefactive