against the City of Sheffield, compelling them to cease polluting the river Don with this clarified liquid. The fact is the nuisance from the river has remained undiminished, and the works have been f no avail. The clarified liquid had to be rendered non putrescible by some means or another, the works performed no such process, so the objectionable process was continued in the river just as it was before the works were started. Eighteen years ago Sheffield acted in accordance with its lights and upon the best advice it was then possible to obtain. The point is, however, not that Sheffield was to blame, but that Sheffield was unfortunate. The same cannot be said of towns which at the present date take no lesson from the errors of the past, and spend money in so called sewage purifications works, which may have the effect of weakening the sewage to the extent of the removal of solids, but have no purification effects whatever.

Efforts in connection with the removal of putrescibility in sewage, have during the past few years occupied primary attention, and it is now generally taken for granted that in this connection the whole crux of the matter lies. It is understood that no matter to what extent raw sewage is chemically sterilised, such sterilisation only has the effect of retarding putrescence for a time, and that, as soon as the strength of the sterilising agent becomes exhausted, putrescence commences, and the process of the change from the organic to the unorganic must take place. Sterilisation of raw sewage has, therefor, only a temporary effect, and may be of use locally to retard a nuisance until such time when the sewage is removed to a safe distance, but cannot be interpreted as a final method of sewage disposal.

The chief nuisance attached to sewage whether collected in enclosed spaces, or discharged into running or quiescent waters, is the effect of the process of putrescense. We have said that fresh sewage, diluted by the water carriage system, presents very little smell, and it is only when allowed to stand and chemical changes commence that foul odours are given off. It is therefor obvious that if this chemical change of putrescence can be effected rapidly under control and with a minimum of nuisance, the chief objection, from a nuisance point of view, of discharging the effluent sewage into a stream or lake is removed. The removal of putrescibility is, therefore, practically the standard of purification required in Great Britain, Europe and the American States.

The Fifth Report of the British Royal Commission states page 221, par. 322, as follows. "For the guidance of local authorities we may provisionally state that an effluent would generally be satisfactory if it complied with the following conditions :—"

"(1). That it should not contain more than 3 parts per 100,000 of suspended matter; and

"(2). That, after being filtered through filter paper, it should not absorb more than

" (a). 0.5 part by weight per 100,000 of dissolved or atmospheric oxygen in 24 hours.

" (b). I.o part by weight per 100,000 of dissolved or atmospheric oxygen in 48 hours, or

" (c). 1.5 parts by weight per 100,000 of dissolved or atmospheric oxygen in 5 days.

"At many sewage works which we have had under observation effluents of this class are uniformly produced."

A sewage effluent presenting an analysis such as the above is practically non-putrescible, incapable of producing any further nuisance no matter where discharged, but is not by any means a drinking water, or fit to mix with a drinking water supply, unless highly diluted. What then is the true meaning and bearing of the term "removal of putrescibility?" Surely if sewage disposal is to be effective, it should mean that there is no longer any danger to a water supply from an admixture of the purified effluent. Such, however, is not the case as far as the mere removal of putrescibility is concerned. Removal of putrescibility simply means that the effluent is not liable to further putrefaction will not rediscolor, and is incapable of giving off foul gases or odours; and further that it will not absorb oxygen from the water receiving the effluent and thereby endanger fish life. Fish are not poisoned by sewage, but are asphyxiated for lack of oxygen in the water.

The Royal Commission page 218, par. 309, state: "We are satisfied that rivers, generally those traversing agricultural as well as those draining manufacturing or urban areas, are necessarily exposed to other pollutions, besides sewage, and it appears to us, therefor, that any authority taking water from such rivers for the purpose of water supply, must be held to be aware of the risks to which the water is exposed, and that it should be regarded as part of the duty of that authority, systematically and thoroughly, to purify the water before distributing it to their customers." Further in par. 310, the commission state "we do not consider that in the present state of knowledge, we should be justified in recommending that it should be the duty of a local authority to treat its sewage so that it should be bacteriologically pure."

If the above be the case, the question may be asked, why then the necessity for sewage purification at all, even to the extent of the removal of putrescibility? The answer is a plain practical one. If raw sewage, which has not first been rendered at least non-putrescible, be discharged into a drinking supply source, it is practically impossible by filtration or even by methods of sterilisation to produce satisfactory drinking water from such a source. The removal of putrescibility means the reduction of the original bacteria in the sewage, it also means an effiuent in which pathogenic bacteria cannot long exist be-It further means cause of lack of nutriment. an effluent which can be practically and economically sterilised if reqired. Absolute sewage purification must consist of three processes: 1st. Removal of Solids. 2nd. Removal of Putrescibility, and 3rd. Sterilisation. The point is whether it is necessary to apply the 3rd process to the non putrescible sewage or apply it to the drinking water itself. It is obvious. for the reason, that a stream may receive other pollution apart from sewage, that even if the 3rd process was applied to the sewage effluent, it would still be necessary to also apply it to the water before distributing it for drinking purposes. There is obviously no reason for this double application of a process, except perhaps under rare circumstances. It is, therefor, now practically agreed that an authority has done its duty by presenting a sewage effluent purified to such an extent, as to make it possible within practical limits for the authority to also treat satisfactorily its water supply drawn from a source receiving a sewage effluent.

To be Continued.

THE DIVIDED RESPONSIBILITY IN RECARD TO PUBLIC HEALTH.*

By Dr. C. A. Hodgetts

(Chief Health Officer of Ontario).

For the enforcement of all public health measures the personal or individual responsibility must ever rank as the most important factor. Municipal councils may pass by-laws and legislatures enact laws. It is just here at this point both bodies rise to their responsibility, but fail to enforce the same, or, as is too often the case, but imperfectly enforce them, or where an attempt is made to provide for some system of inspection—as is often necessary—this is done by the officials in a perfunctory manner, whereby there is set up a false security, and good intentions are thwarted.

It must ever rest with the certain number of right-

*Read before the Saskatchewan Medical Association, July 7th, 1909, at Saskatoon.