

recent years, nor am I aware that it is in use by any Canadian analyst at present. Prof. Marsan, in December, 1888, found 9 parts organic carbon and 0.47 parts nitrogen per million in the Ottawa city supply, and did not consider these numbers to condemn the water for domestic use.

The ignited residue contains the inorganic salts, sand, etc., which were present in the water. Unless these are in excessive amount their discrimination is not necessary, since in ordinary water samples they consist of lime, magnesium, or soda salts, quite harmless in character, unless, as I have already explained, the water is wanted for boiler supply. Many analyses of the Ottawa river water shew the ignited residue to vary from 20 to about 80 parts per million, according to the season of the year, and the part of the river from which the sample is collected. Other rivers show a much higher inorganic content, as, for instance, the Grand River, at Brantford (Nov., 1889), 348 parts per million, and the Assiniboine, near Winnipeg (May, 1888), which gave 1088 parts per million.

In this residue, however, we always look for phosphoric acid, since phosphates are highly characteristic of sewage, and their presence in the minutest traces is a very suspicious indication.

7. *Nitrogen* existing as ammonia in water is present in consequence of the fact that whenever organic matter containing nitrogen undergoes decay a considerable proportion of this nitrogen takes the form of ammonia, and the exceeding solubility of this gas in water causes it to be at once dissolved. You are, many of you at least, acquainted with the fact that the atmosphere of a stable, unless kept very thoroughly cleaned, has a decided smell of spirits of hartshorn. This odour is due to the decomposing nitrogenous matters present, and the formation of ammonia as one of the products of decay. The universal occurrence of organic decay makes it practically impossible that a natural water should be absolutely free from ammonia. When, as in some tables of analysis, you find nitrogen as ammonia stated to be absent, you must understand this to mean that the amount present is too small to make its quantitative estimation possible. Yet it is wonderful with what certainty we can measure minute traces of ammonia. When you find tables in which the nitrogen existing as ammonia is stated to three places of decimals,