

In order to clearly understand this matter we will consider the composition of waters of different qualities, and if I may be permitted to express the opinion it would be well if a good deal of attention were given to this, because without such a knowledge a mere report of the result of a water-analysis will convey very little information.

1. Physical characters. It is a difficult matter as I have already said to judge the value of a sample of water from these alone, and they should never be trusted to. A clear, bright, sparkling water leads us to jump at the conclusion that it is wholesome. It is notoriously the case that often the most polluted and dangerous waters have just these characters. We must therefore take up the position that while we are safe in rejecting a water which does not possess these qualities, yet we are not safe in accepting it without corroborative evidence.

Reaction. If alkaline, we are put on our guard, as this is usually the concomitant of ammonia and its compounds which is strongly suggestive of animal contamination. However, it may be alkaline and yet harmless even when it contains  $\text{Ca}$  and  $\text{Mg}$  salts.

The ammonias and nitrites and nitrates. These may be taken together. When the organic (albuminoid) ammonia amounts to 0.5 per 100,000 then the proportion of free ammonia becomes an element in the calculation. A water is generally considered just within the border line of safety if the free and albuminoid ammonia are .005 and .008 parts per 100,000 respectfully. Much "albuminoid" along with a small amount of free ammonia indicates vegetable contamination and this indication gains further support if there is only a faint trace of chlorides and no excess of nitrites and nitrates. Much "free ammonia" and excess of chlorides nitrates and nitrites will denote animal pollution. Nitrites and nitrates are in themselves harmless, but if found in a water exposed to risk of pollution may be sufficient to condemn it.

Nitrates 0.2 per 100,000, over this suspicious.

Nitrites 0.3 per 100,000, over this suspicious.

Oxidised nitrogen .5 per 100,000.

Nitrites and nitrates are as a rule due to the oxidation of nitrogenous organic matter of animal origin and if found in water from a source open to suspicion must be regarded as oxidised filth. Nitrites as a rule indicate more recent pollution and therefore more dangerous than nitrates, which indicate remote pollution.