

FILTERS AND THE FILTRATION OF PUBLIC WATER SUPPLIES— IMPORTANT CONTRIBUTION OF DR. PERCY FRANKLAND.

IT might be safely predicted that, if absolutely pure water could be used universally instead of the water now used from wells, streams and lakes, the mortality from zymotic diseases would at once fall to one-half the present rate, and typhoid fever, now so common, and so destructive of the best lives, would soon be practically unknown. The filtration of water has now reached such perfection that unlimited quantities of water can be rendered almost as pure as distilled water. Dr. Frankland, Ph. D., F. C. S., etc., of London, Eng., the well known scientist, who has given much attention to the bacteriology of water, says: "It has been generally supposed that most filtering materials offer little or no barrier to micro-organisms, and that the latter are capable of passing without sensible obstruction through the pores of filters containing pulverized materials. These (my) experiments, however, show that it is extremely simple to construct filters which shall possess the power of removing micro-organisms, in the first instance at least. This power is, moreover, possessed by substances which exercise scarcely any chemical action on the organic matter present in the water."

Again he writes: "1. It is possible by a proper filtration to entirely deprive water of its germ life. 2. After complete deprivation of its germ life, if water is exposed to the ordinary influence of air and contact with the biologically unclean materials used for its storage and conveyance, this germ life is rapidly reintroduced and multiplied. This makes it desirable to furnish the filtered water for use as soon after the operation as practicable.

3. Most filtering materials lose a certain proportion of their efficiency with continued use. In some cases the water filtered through materials which had been in use for a month had its germ life greatly increased by the operation. This was the case with animal charcoal. 4. Some materials, which exert but an insignificant chemical action, are completely successful in purifying the water from a biological point of view. This is the case with powdered coke and charcoal. 5. It is necessary to renew or cleanse the filtering material very frequently in order to obtain the best results. 6. What is gained in rapidity of filtration pure and simple is lost in efficiency."

In a recent report on his repeated examinations of the London water supply, Dr. Frankland states, "These examinations reveal the highly important fact that, whilst the number of micro-organisms present in the unfiltered water is usually very great, amounting occasionally to about one hundred thousand in a cubic centimetre, or what is more easily realisable, to five thousand in a single drop of average size, the same water, after purification by storage and filtration, contains a comparatively very small number, frequently not exceeding one hundred in the cubic centimetre."

It must be borne in mind that the London water, before being filtered, is very impure, and that the process of filtering is not yet of the most perfect kind. Filters which remove ordinary organic or inorganic impurities have little effect in removing bacteria, or disease germs. In the Public Health Section of the German Association of Naturalists and Physicians, Dr. Plagge, of Berlin,