

## DRINKING WATER.

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WITH SPECIAL REFERENCE TO THE OTTAWA CITY SUPPLY.

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A very little thought given to the subject will convince us of the hopelessness of seeking for absolutely pure water as a natural product. The great solvent power of water, together with the universal presence of substances, gaseous liquid or solid, which it can take into solution, are conditions which amply suffice to explain the contamination of all natural sources of supply. The whole of the fresh water on the face of the earth has fallen as rain on field, forest, city, street, swamp, or other more or less similar gathering-ground, except such insignificant fraction as falls directly into river or lake. The soluble impurities present in such gathering grounds are conveyed to the storage centres in river, lake or well, and it is fortunate for us that nature has provided, in the course of natural filtration to which such supplies are necessarily subjected, a means of reducing in a great degree the pollution due to organic matter, as will be hereafter explained more fully. The mineral content remains to give so-called "hardness," or other specific character to the supply of each locality. Even before the rain has reached the surface of the earth, however, it is far from pure, since there are always present in the atmosphere particles of organic and inorganic dust, ill-smelling and often poisonous gases, the products of decay, microscopic germs, and other impurities which are washed out of the air by the rain, and make it,—specially the first portion of each shower,—decidedly polluted and unfit, without filtration, to be used as a food supply. The conditions which influence the solubility of solids in water are essentially three, namely, the specific nature of the substance, the temperature of the water, and the presence of other bodies in solution. Even among quite soluble substances very marked and interesting specific differences may be observed. In the six flasks before you I have suspended, in muslin bags, equal quantities (1 ounce) of six different salts, themselves having important relations in the subsequent treatment of this subject, all of them decidedly soluble, and powdered to an approxi-