face water, rain water, and moderately hard spring or well water are all wholesome, and can be drunk with impunity and without inconvenience by persons who have become accustomed to their use. It is true, however, that persons accustomed to drinking hard water generally experience some derangement of their digestive organs on beginning to use soft water. But this cannot be taken as an argument against the use of soft waters, as the same derangement is liable to occur when conditions are reversed.

It is contended by many that the human system needs salts of lime, etc., and that these compounds are furnished in an assimiable form in water, and that consequently a somewhat hard water is most advantageous for town supply. I will allow this contention to pass without remark, except to say that a hard water whose hardness is due to the presence of sulphate of lime is not well suited either for drinking or domestic use, and is injurious to most persons.

Waters containing much vegetable matter are also said to be injurious, causing malarial and other fevers. The attention of sanitarians and water experts is, however, directed principally to the effect of water which is polluted by the waste materials from manufactories and dwellings, or by the sewage from towns and cities, and the idea is very generally held that waters thus polluted may be, and frequently are, the cause of specific diseases, such as malarial fever, typhoid fever, diptheria, etc. This is a matter open for considerable discussion and expression of opinion among those who have studied the question, and which I may say cannot at this present stage of science be either absolutely proven or disproved. But the duty of any engineer who is called upon to decide the question of water supply is perfectly clear, and that is, to err on the side of safety by admitting that specific diseases may be conveyed by means of drinking water, and to guard all sources of domestic water supply from the possibility of contamination from these sources.

"However views may differ," says Nicolls, "as to the possibility of injury from this or that particular form of contamination, we are safe in accepting the two following principles as fundamental guides in the selection of a water for domestic supply: (1) A water suitable for domestic supply must be free from all substances which are known to produce an injurious effect on the human system, or which are suspected with good reason or on good authority to produce such an effect. (2) The water should be as far as practicable free from all substances and from all associations which offend the general aesthetic taste or sense of the community, and thus affect the system through the imagination."

The first of these principles needs no argument to justify it. With regard to the second, while there is no doubt of the power of the imagination and its effect on the physical system, common sense must fix a limit to the application of this principle, and reasonable latitude must be allowed the engineer, according to the circumstances surrounding each particular case. Undoubtedly, the best water for drinking is a moderately soft spring water, in which all possibility of contamination is out of the question. Unfortunately, it is seldom that such water can be obtained in sufficiently large quantities. Many spring waters are so hard that, while pleasant and suitable for drinking purposes, they are unsuitable for manufacturing and general domestic purposes, and I hold it is a serious mistake to claim that a water which is best for drinking must be chosen at all hazards for town supply.

RAIN WATER AS A SOURCE OF SUPPLY.

The collection of rain water as a source of public supply is in our case, for manifold reasons, beyond consideration. In many cases, however, where there is no public supply, and wells are out of the question, the collection of rain water by the individual householder becomes a necessity. This is also the case where the public supply is too hard for washing and similar purposes. The collection and storage of rain water is attended by many changes. Rain which falls even in the open country is often far from being pure, as it absorbs from the air both gaseous and solid substances. And when the rain is collected from roofs near habitations, the impurities may be considerable and a serious menace to health. Particularly is this the case after a dry spell, and where first portions of the rain-fall are collected and used. Besides these sources of contamination to which rain water is naturally and unavoidably liable, there are accidental sources of contamination, all of which tend to render the collection of rain water undesirable except in very exceptional cases.

The storage of rain water presents just as much room for exercise of care as does the collection, and while I might wish to enlarge upon this phase of my subject, I feel that time is too limited to further refer to this.

SURFACE WATERS AS A SOURCE OF SUPPLY.

This question is of itself of the greatest importance, but unfortunately the town of Montreal West is so situated that no available supply of this description can be reached unless at enormous and extravagant expense. For the sake of time, that we may more fully discuss the latter portions of our subject, I will pass over this important source of supply and the study of its various advantages or disadvantages.

GROUND AND DEEP-SEATED WATERS.

Let us now consider the third and fourth divisions I have made on this question. I intermingle these to better illustrate local conditions, a study and description of which is the real object of this paper. A certain proportion of the water which falls as rain or snow sinks into the earth, and where the surface deposit is gravel or other porous material, overlying an impervious body, the water collects to form the ground water of that particular locality. But while a portion of the water encounters impervious stratum, another portion of the water precipitated from the atmosphere falls upon the edges of up-turned rocky strata or upon rocky deposits, which are either porous or so fissured that they afford a more or less free passage for the water. And when this fissured or pervious stratum has an outcrop at some lower level, the water may issue in the form of springs, the flow of which will be more or less copious. And when the course of the water has not been such that it has been heavily charged with mineral matter, such springs furnish one of the best sources of water supply. The advantages of spring water over surface water for domestic supply is considered by many experts of sufficient importance to guarantee the spending of considerable sums of money in order to secure it.

When the water precipitated from the atmosphere is absorbed by a pervious stratum situated between two impervious strata, the water may exist under considerable hydrostatic pressure, and the occurrence of a "fault" in the upper strata may allow the water to rise to the surface of the ground as springs, but very often the water can be utilized only by sinking or boring artesian wells.

Allow me to remark that the term "artesian well" is often misapplied in this connection. An artesian well is a well which is sunk or bored through an impervious stratum so as to reach water bearing strata in which water is under hydrostatic pressure, and as soon as this stratum is reached and the well is opened the water rises under hydrostatic pressure, to or higher than the surface of the ground. A well of this kind is very properly called artesian, when, as nearly always occurs on the Island of Montreal, with a few exceptions, the force or hydrostatic pressure is not sufficient to force the water to the surface of the ground (and such is the case with the first well sunk at Montreal West, where the water rises to within 200 feet of the surface, and no higher). Then, wells of this kind, no matter what the depth of the water may be, can only be classed as deep wells, and the term artesian is improperly applied.

(To be Continued.)